Exhibit B24 - Invalidity of 12,211,095 in view of ScanZoom

ScanZoom anticipates and/or renders obvious (alone or in combination with other references), at least under USAA's apparent infringement theories, all asserted claims of U.S. Patent No. 12,211,095 ("the '095 patent"). ScanZoom was known, publicly used, and/or on sale in the United States at least as of October 11, 2004 and is therefore prior art to the '095 patent. Example evidence of the design and function of ScanZoom includes, but is not limited to:

- "New Technology Enables Camera Phones To Scan Bar Codes," Forbes (Feb. 17, 2024) ("Forbes") (**REGIONS_USAA-00005399**);
- "Optical Intelligence for Mobile Devices," ScanZoom Optical Intelligence ("Optical Intelligence") (**REGIONS_USAA-00005397**);
- WebArchive of Scanbuy Various Possible Applications, http://scanbuy.com/Website/marketing.htm (Aug. 3, 2004), available at https://web.archibve.org/web/20040803000606/http:/scanbuy.com/Website/marketing.htm ("Brochure") (**REGIONS_USAA-00005371**);
- Web Archive of Optical Intelligence for Mobile Devices, http://www.scanbuy.com/pdfs/scanzoom_brochure.pdf (June 10, 2004), available at https://web.archive.org/web/20040610205341/http:/www.scanbuy.com/pdfs/scanzoom_brochure.pdf ("Brochure Archive") (**REGIONS_USAA-00005393**);
- "Scanbuy, Inc.," Scanbuy Optical Intelligence ("Trifold") (**REGIONS_USAA-00005395**);
- Web Archive of Scanbuy, Inc. trifold, http://www.scanbuy.info/scanzoom/docs/trifold.pdf (sept. 21, 2004), available at https://web.archive.org/web/20040921012712/http:/www.scanbuy.info/scanzoom/docs/trifold.pdf ("Trifold Archive") (**REGIONS_USAA-00005369**);
- U.S. Patent Application No. 7,156,311 ("Attia") (**REGIONS_USAA-00005372**);
- ScanZoom Interview, http://www.scanclik.com/interview/interviewscanzoom-highres.tm (June 4, 2004), ("Interview Video");
- Web Archive of ScanZoom Interview, http://www.scanclik.com/interview/interviewscanzoom-highres.tm (June 4, 2004), available at https://web.archive.org/web/20040604234157/http:/www.scanclik.com/interview/interviewscanzoom-highres.thm (June 4, 2004) ("Interview Archive") (**REGIONS_USAA-00005394**); and
  Web Archive of Scanbuy Optical Intelligence Summary, http://scanbuy.com/Website/colutions_overview.htm (Aug. 3, 2004), available at https://web.archive.org/web/2004083002420/http:/scanbuy.com/Website/solutions_overview.htm ("Optical Intelligence Summary") (**REGIONS_USAA-00005370**).

ıs of the reference that correspond to each element, including at least under USAA's apparent interpretation of the Complaint and Infringement Contentions. Where the chart below states that the reference "discloses," "teaches," or uch disclosure, teaching, or suggestion may be express, implied, or inherent. The cited evidence is merely illustrative, to cite alternative or additional evidence.

t construes, or is intended to construe, the specification, file history, or claims of the asserted patents. In addition, l be treated as an admission or suggestion that Regions agrees with USAA regarding either the scope of any of the parent interpretation of the scope of the asserted claims, or that Regions' accused products meet any limitations of the

EXHIBIT 1082
REGIONS v. USAA
IPR2025-01356

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- "New Technology Enables Camera Phones To Scan Bar Codes," Forbes (Feb. 17, 2024) ("Forbes") (**REGIONS_USAA-00005399**);
- "Optical Intelligence for Mobile Devices," ScanZoom Optical Intelligence ("Optical Intelligence") (**REGIONS_USAA-00005397**);
- WebArchive of Scanbuy Various Possible Applications, http://scanbuy.com/Website/marketing.htm (Aug. 3, 2004), available at https://web.archibve.org/web/20040803000606/http:/scanbuy.com/Website/marketing.htm ("Brochure") (**REGIONS_USAA-00005371**);
- Web Archive of Optical Intelligence for Mobile Devices, http://www.scanbuy.com/pdfs/scanzoom_brochure.pdf (June 10, 2004), available at https://web.archive.org/web/20040610205341/http:/www.scanbuy.com/pdfs/scanzoom_brochure.pdf ("Brochure Archive") (**REGIONS_USAA-00005393**);
- "Scanbuy, Inc.," Scanbuy Optical Intelligence ("Trifold") (**REGIONS_USAA-00005395**);
- Web Archive of Scanbuy, Inc. trifold, http://www.scanbuy.info/scanzoom/docs/trifold.pdf (sept. 21, 2004), available at https://web.archive.org/web/20040921012712/http:/www.scanbuy.info/scanzoom/docs/trifold.pdf ("Trifold Archive") (**REGIONS_USAA-00005369**);
- U.S. Patent Application No. 7,156,311 ("Attia") (**REGIONS_USAA-00005372**);
- ScanZoom Interview, http://www.scanclik.com/interview/interviewscanzoom-highres.tm (June 4, 2004), ("Interview Video");
- Web Archive of ScanZoom Interview, http://www.scanclik.com/interview/interviewscanzoom-highres.tm (June 4, 2004), available at https://web.archive.org/web/20040604234157/http:/www.scanclik.com/interview/interviewscanzoom-highres.thm (June 4, 2004) ("Interview Archive") (**REGIONS_USAA-00005394**); and
  Web Archive of Scanbuy Optical Intelligence Summary, http://scanbuy.com/Website/colutions_overview.htm (Aug. 3, 2004), available at https://web.archive.org/web/2004083002420/http:/scanbuy.com/Website/solutions_overview.htm ("Optical Intelligence Summary") (**REGIONS_USAA-00005370**).

Regions has charted the portions of the reference that correspond to each element, including at least under USAA's apparent interpretation of the claims as reflected in USAA's Complaint and Infringement Contentions. Where the chart below states that the reference "discloses," "teaches," or "suggests" a claim limitation, such disclosure, teaching, or suggestion may be express, implied, or inherent. The cited evidence is merely illustrative, and Regions reserves the right to cite alternative or additional evidence.

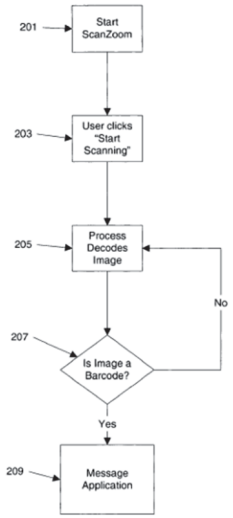
No part of this exemplary chart construes, or is intended to construe, the specification, file history, or claims of the asserted patents. In addition, nothing stated in this chart shall be treated as an admission or suggestion that Regions agrees with USAA regarding either the scope of any of the asserted claims or Regions' apparent interpretation of the scope of the asserted claims, or that Regions' accused products meet any limitations of the claims.

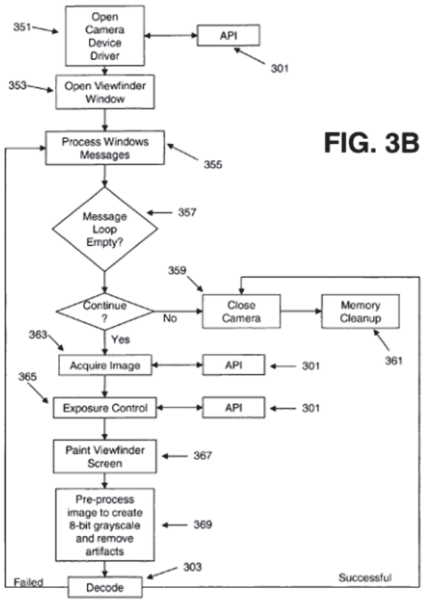
To the extent that USAA contends that ScanZoom does not disclose one or more limitations of the asserted claims, it would have been obvious to combine the teachings of ScanZoom with (1) the knowledge of one of ordinary skill in the art, and/or (2) the teachings of any of the prior art set forth in Regions' other invalidity charts and cover pleading, to show all the limitations of the asserted claims, including for the reasons set forth in Regions' Invalidity Contentions Cover Pleading, which are incorporated herein.

The cited disclosure further shows that it would have been obvious to combine ScanZoom with the prior art set forth in Regions' other invalidity charts and cover pleading, for example by showing similarities with the other prior art and/or elements that could be improved by combination, replacement, and/or modification in view of the other prior art.

Because USAA has yet to identify any limitation of the asserted claims that it contends is not fully disclosed by ScanZoom, either alone or in combination with other prior art cited by Regions, Regions expressly reserves the right to rebut any such contention, including by identifying additional § 103 combinations, if any such contention is made by USAA.

Claims	**Prior Art**
1[pre]. A system enabling mobile check deposit auto-capture functionality via video frame processing, the system comprising:	To the extent the preamble is limiting, ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[a] system enabling mobile check deposit auto-capture functionality via video frame processing, the system." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1

Claims	Prior Art
	ScanZoom (Attia) at FIG. 2A  FIG. 2A

Claims	Prior Art
	ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom

Claims	Prior Art
	application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images

Claims	Prior Art
	is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209.

Claims	Prior Art
	ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the

Claims	Prior Art
	camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a

Claims	Prior Art
	photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found.

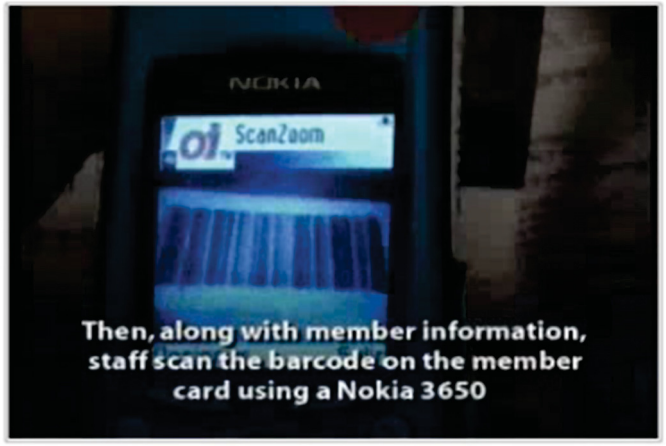
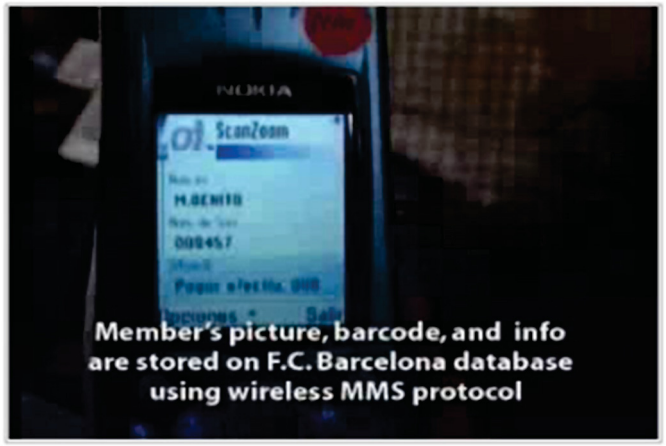
Claims	Prior Art
	ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data.

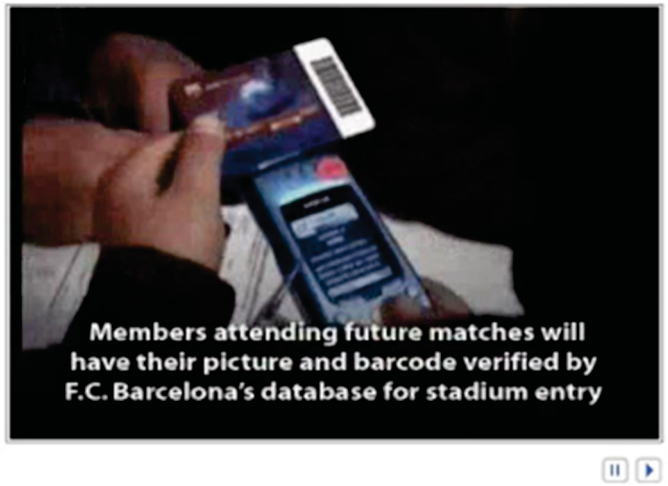
Claims	Prior Art
	ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN2oi bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market."

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

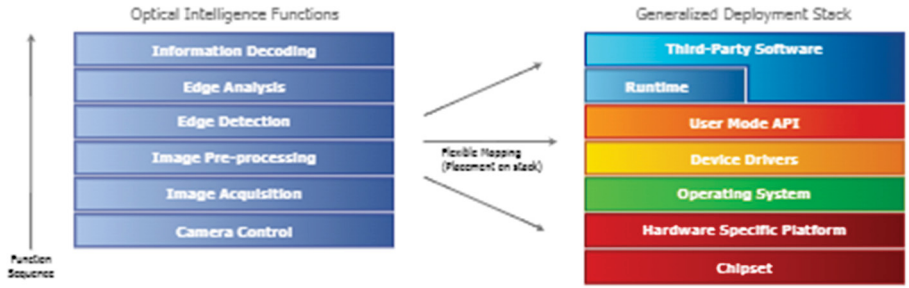
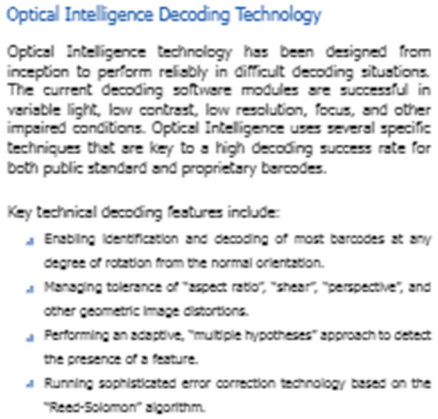
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 1 **INSTALLATION ON DEVICE:** The application can be transferred to the mobile device in the following ways: • Application is embedded in a microchip such as Texas Instrument's OMAP™ 5910 or Intel's XScale™ PXA800F chip. • Application is downloaded and installed from PC using BlueTooth connectivity. • Application is downloaded and installed from website using WAP connectivity on GPRS enabled phones. • Application is transferred from one device to another through SMS, Bluetooth or infrared. ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application**: On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application**: You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services**: You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application**: If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing**: You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE**  ScanZoom (Optical Intelligence) at 2 **SYSTEM REQUIREMENTS:** - Integrated or add-on digital camera (min. resolution of 1.0 MP) - 100kB of memory - 16 MB of RAM - 10 cms tolerance level on camera - Processor: 200 MHz 32-bit ARM processor. It will work on any 32-bit CPU having an ANSI standard C compiler

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: • Small-footprint barcode decoding engine • Time and memory efficient • Decode most linear and 2 dimensional barcodes • Support various image formats: BMP, PNG, JPG, YUV

Claims	Prior Art
	ScanZoom (Trifold) at 1 Supported software and operating system platforms: - Symbian 6.x / 7.x - Microsoft Pocket PC 2000 and above - Microsoft Windows CE .NET 4.x - Microsoft Windows 98/2000/XP - Java with MMAPI support (JSR-135, MIDP 1.0/2.0) - BREW (to be released Q2 2004) - PALM v5.0 (to be released Q2 2004) ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.**

Claims	Prior Art
	ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: - Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. - Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. - Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. - Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1a] a mobile device of a user, the user's mobile device including a camera, a processor, and a memory coupled to the processor, the memory storing:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a mobile device of a user, the user's mobile device including a camera, a processor, and a memory coupled to the processor, the memory storing." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the

Claims	Prior Art
	barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants ("PDAs"), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist. ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the

Claims	Prior Art
	availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope

Claims	Prior Art
	with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as "ScanZoom") designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image.

Claims	Prior Art
	ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile

Claims	Prior Art
	device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded

Claims	Prior Art
	information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305

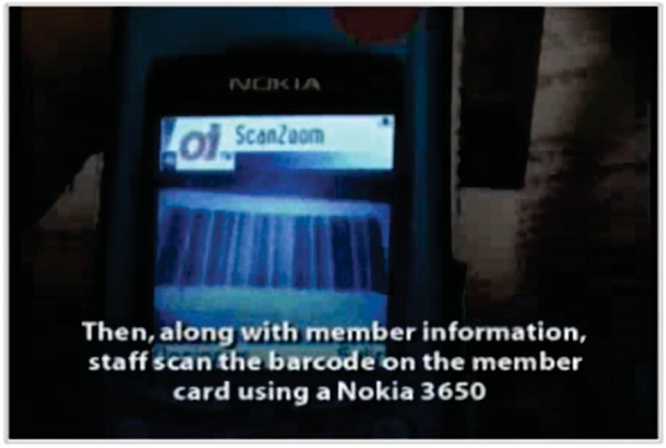
Claims	Prior Art
	closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a

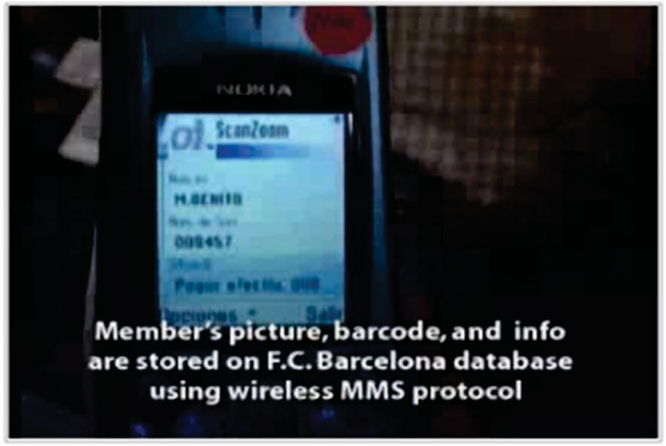
Claims	Prior Art
	number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by

Claims	Prior Art
	ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

Claims	Prior Art
	ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN20i bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market." ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:01–0:00:05  ScanZoom (Interview Video) at 0:00:07–0:00:11 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55  ScanZoom (Interview Video) at 0:00:55–0:01:25 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Interview Video) at 0:01:33–0:01:46 

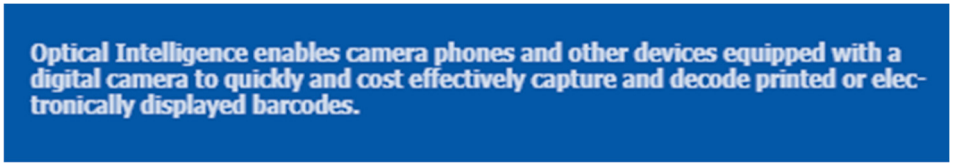
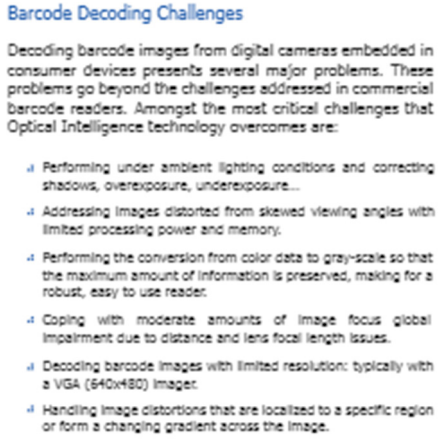
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched.

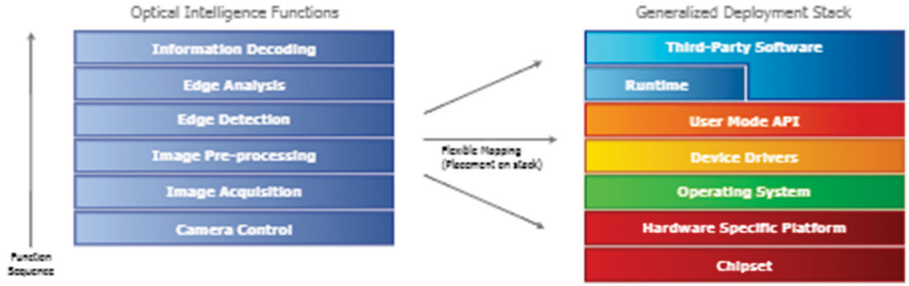
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned. ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 1 **INSTALLATION ON DEVICE:** The application can be transferred to the mobile device in the following ways: • Application is embedded in a microchip such as Texas Instrument's OMAP™ 5910 or Intel's XScale™ PXA800F chip. • Application is downloaded and installed from PC using BlueTooth connectivity. • Application is downloaded and installed from website using WAP connectivity on GPRS enabled phones. • Application is transferred from one device to another through SMS, Bluetooth or infrared.

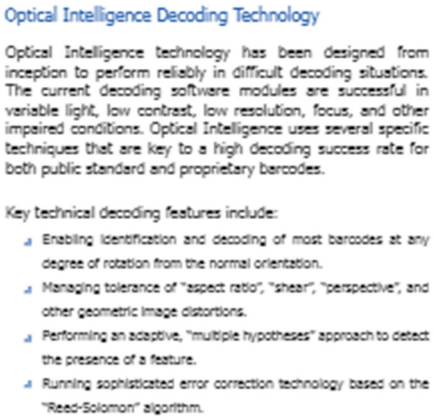
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order. ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required.

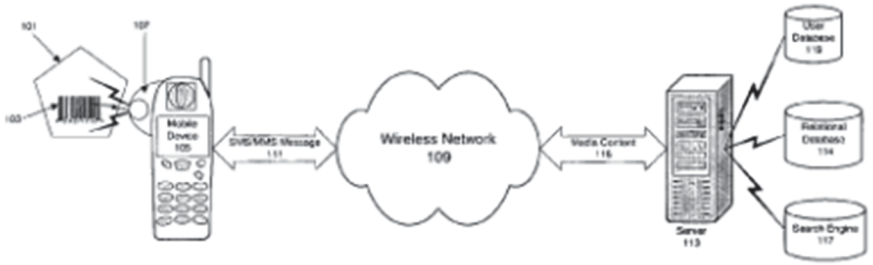
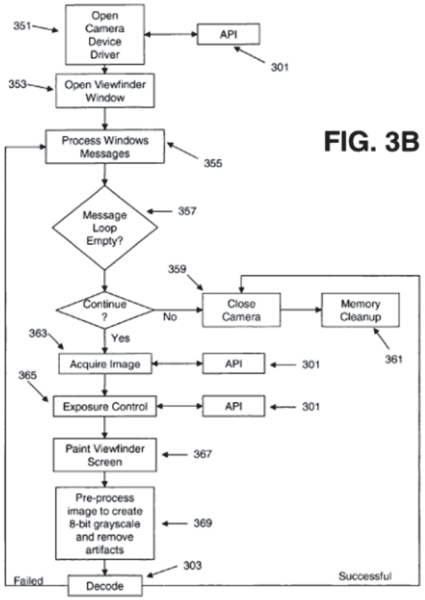
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE**  ScanZoom (Optical Intelligence) at 2 **SYSTEM REQUIREMENTS:** • Integrated or add-on digital camera (min. resolution of 1.0 MP) • 100kB of memory • 16 MB of RAM • 10 cms tolerance level on camera • Processor: 200 MHz 32-bit ARM processor. It will work on any 32-bit CPU having an ANSI standard C compiler ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application

Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 1 Supported software and operating system platforms: - Symbian 6.x / 7.x - Microsoft Pocket PC 2000 and above - Microsoft Windows CE .NET 4.x - Microsoft Windows 98/2000/XP - Java with MMAPI support (JSR-135, MIDP 1.0/2.0) - BREW (to be released Q2 2004) - PALM v5.0 (to be released Q2 2004)

Claims	Prior Art
	ScanZoom (Trifold) at 2  Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2  Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes. ScanZoom (Trifold) at 2  Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image.

Claims	Prior Art
	ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack. ScanZoom (Trifold) at 2 

Claims	Prior Art
	ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitation 1[pre]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1b] a software abstraction layer for controlling the camera, the software abstraction layer comprising Instructions that, when executed by the processor, control the camera; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a software abstraction layer for controlling the camera, the software abstraction layer comprising Instructions that, when executed by the processor, control the camera." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device.

Claims	Prior Art
	ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have

Claims	Prior Art
	become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants ("PDAs"), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist. ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded

Claims	Prior Art
	on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device

Claims	Prior Art
	105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface ("API") 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a

Claims	Prior Art
	"viewfinder" window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step

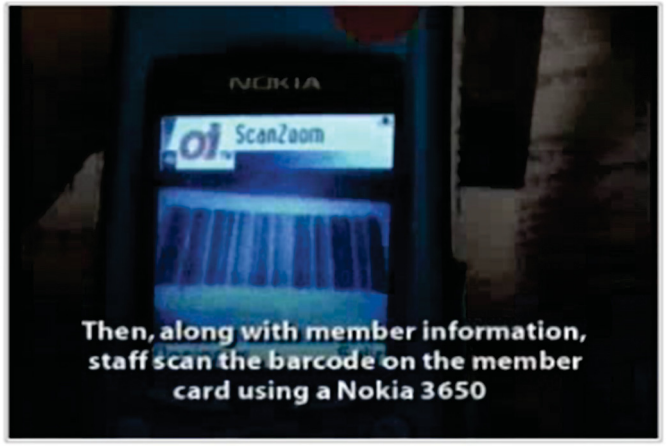
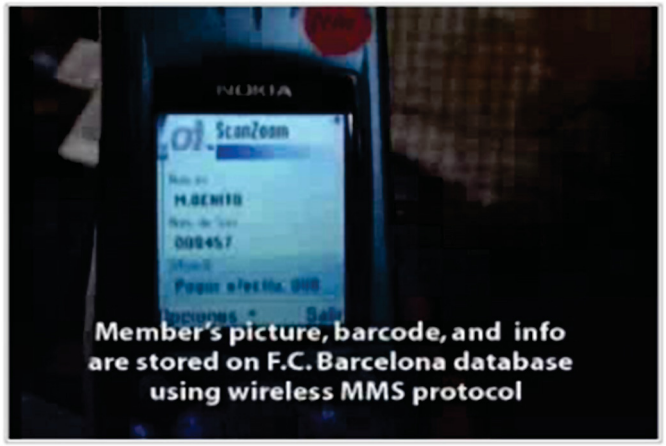
Claims	Prior Art
	361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes

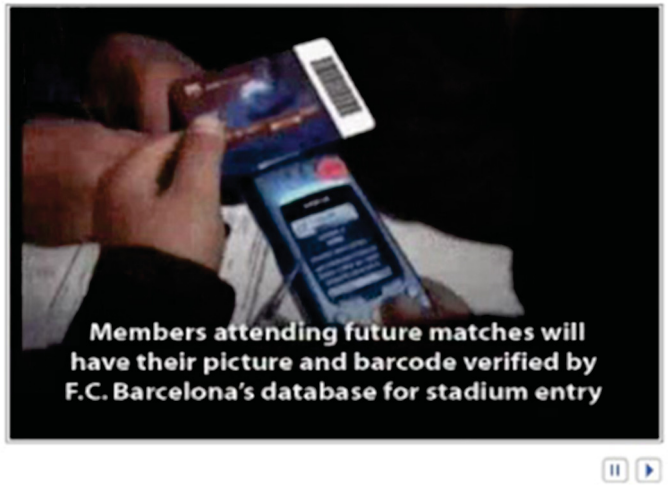
Claims	Prior Art
	ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN2oi bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market."

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

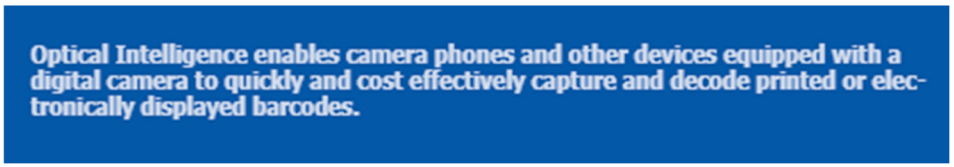
Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

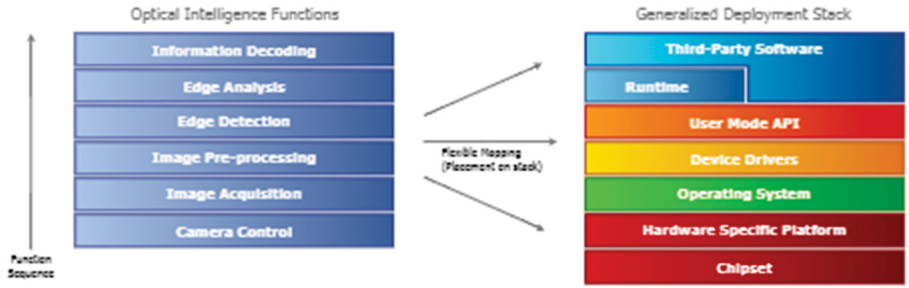
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 1 **INSTALLATION ON DEVICE:** The application can be transferred to the mobile device in the following ways: • Application is embedded in a microchip such as Texas Instrument's OMAP™ 5910 or Intel's XScale™ PXA800F chip. • Application is downloaded and installed from PC using BlueTooth connectivity. • Application is downloaded and installed from website using WAP connectivity on GPRS enabled phones. • Application is transferred from one device to another through SMS, Bluetooth or infrared. ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application**: On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application**: You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services**: You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application**: If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing**: You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

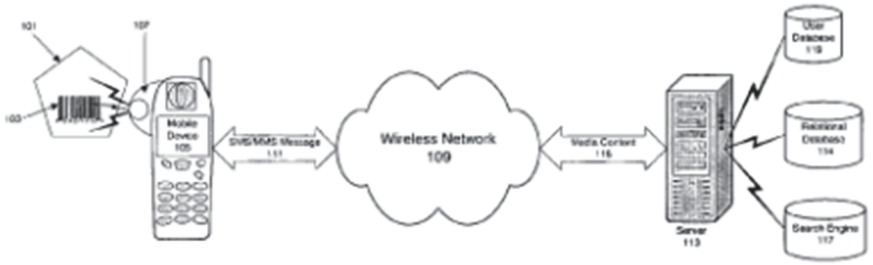
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE**  ScanZoom (Optical Intelligence) at 2 **SYSTEM REQUIREMENTS:** - Integrated or add-on digital camera (min. resolution of 1.0 MP) - 100kB of memory - 16 MB of RAM - 10 cms tolerance level on camera - Processor: 200 MHz 32-bit ARM processor. It will work on any 32-bit CPU having an ANSI standard C compiler

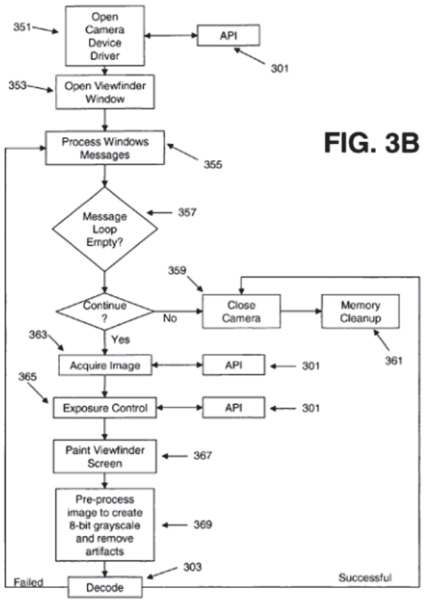
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: • Small-footprint barcode decoding engine • Time and memory efficient • Decode most linear and 2 dimensional barcodes • Support various image formats: BMP, PNG, JPG, YUV

Claims	Prior Art
	ScanZoom (Trifold) at 1  Supported software and operating system platforms: Symbian 6.x / 7.x Microsoft Pocket PC 2000 and above Microsoft Windows CE .NET 4.x Microsoft Windows 98/2000/XP Java with MMAPI support (JSR-135, MIDP 1.0/2.0) BREW (to be released Q2 2004) PALM v5.0 (to be released Q2 2004) ScanZoom (Trifold) at 2  Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2  Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.

Claims	Prior Art
	ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2 Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: - Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. - Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. - Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. - Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre], 1[a]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1c] a downloaded app, the downloaded app associated with a bank to control check deposit by controlling the camera through the software abstraction layer, the	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a downloaded app, the downloaded app associated with a bank to control check deposit by controlling the camera through the software abstraction layer, the downloaded app comprising Instructions that, when executed by the processor, cause the user's mobile device to perform operations including." For example:

Claims	Prior Art
downloaded app comprising Instructions that, when executed by the processor, cause the user's mobile device to perform operations including:	ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1

Claims	Prior Art
	ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a

Claims	Prior Art
	wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as "ScanZoom") designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the

Claims	Prior Art
	barcode image. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109.

Claims	Prior Art
	ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a “preview” window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once

Claims	Prior Art
	barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows

Claims	Prior Art
	message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed

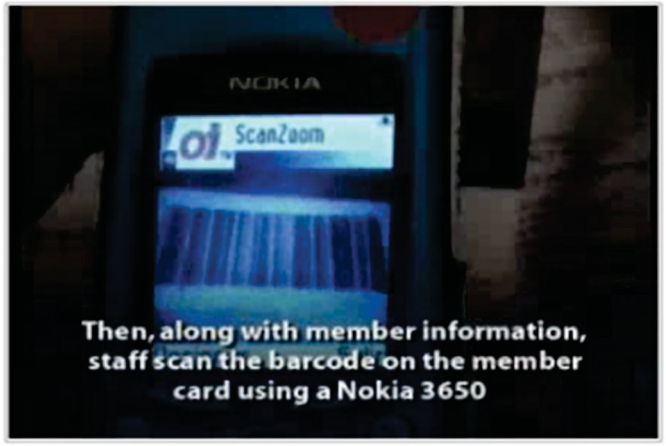
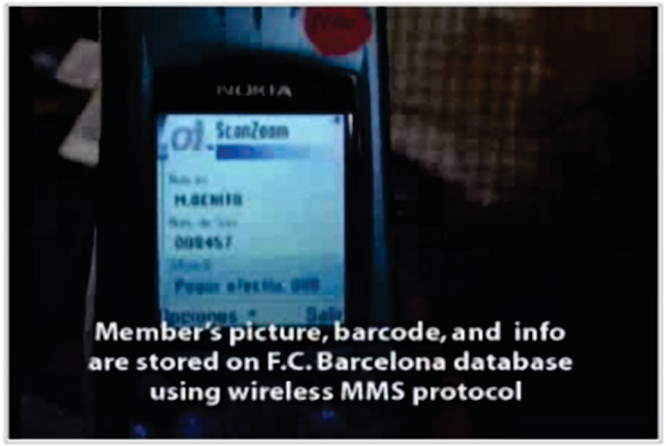
Claims	Prior Art
	using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data.

Claims	Prior Art
	ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN2oi bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market."

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

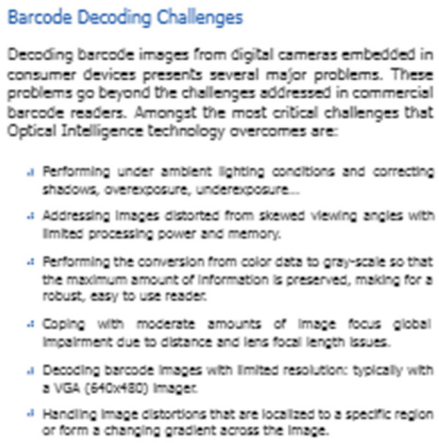
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

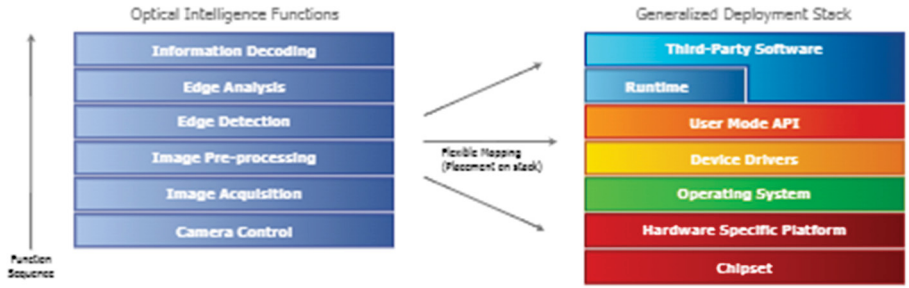
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 1 **INSTALLATION ON DEVICE:** The application can be transferred to the mobile device in the following ways: • Application is embedded in a microchip such as Texas Instrument's OMAP™ 5910 or Intel's XScale™ PXA800F chip. • Application is downloaded and installed from PC using BlueTooth connectivity. • Application is downloaded and installed from website using WAP connectivity on GPRS enabled phones. • Application is transferred from one device to another through SMS, Bluetooth or infrared. ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application**: On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application**: You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services**: You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application**: If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing**: You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

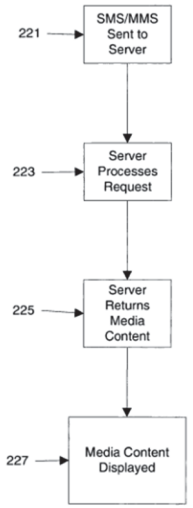
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE**  ScanZoom (Optical Intelligence) at 2 **SYSTEM REQUIREMENTS:** - Integrated or add-on digital camera (min. resolution of 1.0 MP) - 100kB of memory - 16 MB of RAM - 10 cms tolerance level on camera - Processor: 200 MHz 32-bit ARM processor. It will work on any 32-bit CPU having an ANSI standard C compiler

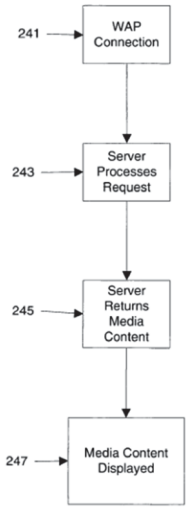
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: • Small-footprint barcode decoding engine • Time and memory efficient • Decode most linear and 2 dimensional barcodes • Support various image formats: BMP, PNG, JPG, YUV

Claims	Prior Art
	ScanZoom (Trifold) at 1 Supported software and operating system platforms: - Symbian 6.x / 7.x - Microsoft Pocket PC 2000 and above - Microsoft Windows CE .NET 4.x - Microsoft Windows 98/2000/XP - Java with MMAPI support (JSR-135, MIDP 1.0/2.0) - BREW (to be released Q2 2004) - PALM v5.0 (to be released Q2 2004) ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.**

Claims	Prior Art
	ScanZoom (Trifold) at 2  Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: • Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... • Addressing images distorted from skewed viewing angles with limited processing power and memory. • Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. • Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. • Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. • Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2  Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2 Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre]–1[b]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1d] providing Instructions to the user for capturing an image of a check;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "providing Instructions to the user for capturing an image of a check." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the

Claims	Prior Art
	barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at FIG. 2B  FIG. 2B

Claims	Prior Art
	ScanZoom (Attia) at FIG. 2C  FIG. 2C ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately

Claims	Prior Art
	and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as "ScanZoom") designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 3:53–67 If ScanZoom sends a MMS message to the server, it launches the MMS Application Id, composes the appropriate message on the fly, and then sends the message to the SMS/MMS server. On the server side, a global system for mobile communications ("GSM") modem connected to the server has the appropriate security identity module ("SIM") card and takes the services from any mobile service provider. The server fetches the MMS message from the GSM modem queue and performs appropriate action depending upon the message. The server can then send back a simple SMS message or can send back a multimedia

Claims	Prior Art
	message service ("MMS") message which can launch a WAP browser on the mobile device and direct it to the appropriate website, or send back information to the user through any other existing wireless protocol. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc.

Claims	Prior Art
	ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways.

Claims	Prior Art
	ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface ("API") 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103.

Claims	Prior Art
	ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a "viewfinder" window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition.

Claims	Prior Art
	ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and

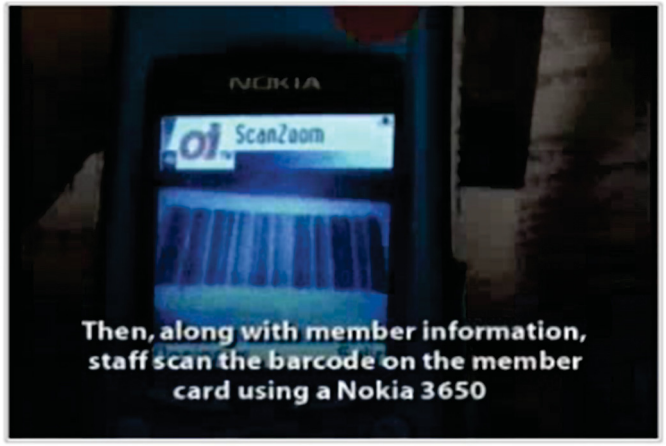
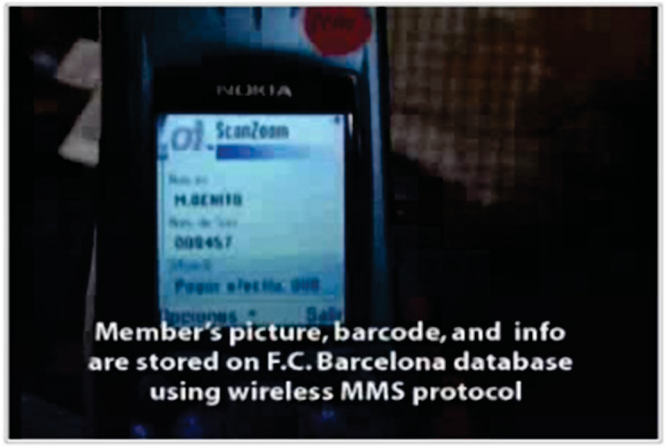
Claims	Prior Art
	repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:12–23 Each barcode font relies on static tables of values to decode each character. These tables are designed using the bit patterns in the barcode font's specification. Each barcode consists of both dark and light elements. The combination of the dark and light elements and their thickness decides the value of the character. The difference of two consecutive edges provides the width of an element. The widths of the elements are then converted into bit patterns and mapped against the static tables to derive the character value. If a good value is returned then the next set of edges is passed. A bad value signifies that the barcode character could not be decoded. ScanZoom (Attia) at 12:24–32 In many barcode formats, the stop character is used as a check digit to ensure that the barcode has been decoded correctly. Detection engine 303 performs such an integrity check in step 463. If the integrity check fails, detection engine either loads another symbology library in step 455 or attempts to re-decode the image in step 457. If the integrity check is passed in step 463, decoding engine 303 is terminated in step 465 and the barcode data is forwarded to the messaging system (see FIG. 2A, step 209). ScanZoom (Brochure) at 1  Various Possible Applications

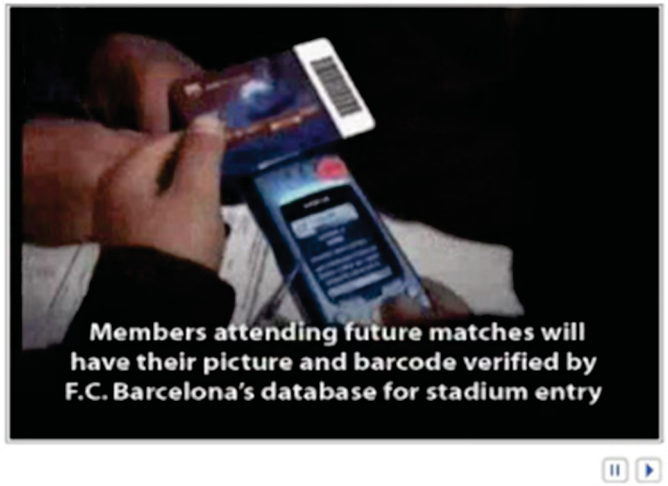
Claims	Prior Art
	ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

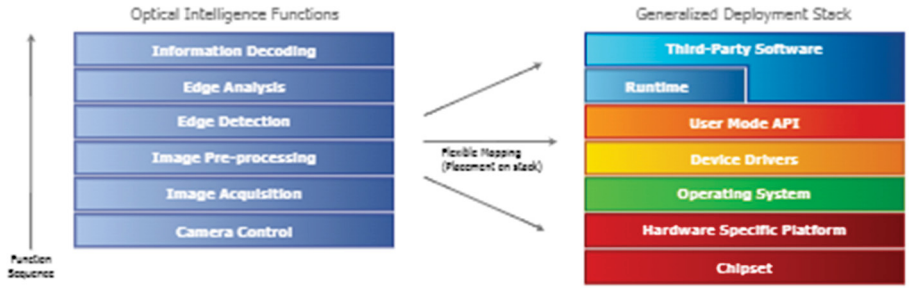
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

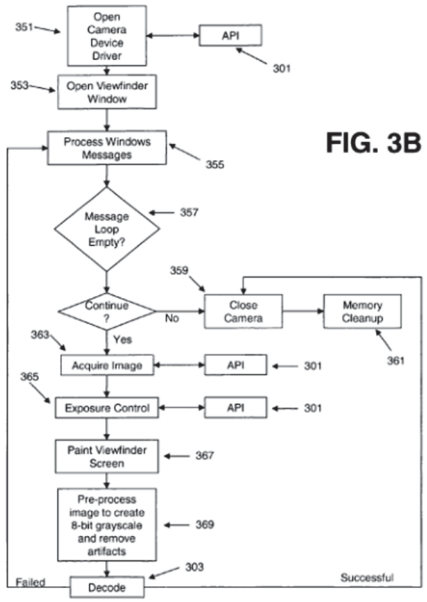
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE** 

Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms.

Claims	Prior Art
	ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2 Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Read-Solomon" algorithm. *See also* limitation 1[pre]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1e] generating a live video of the check in a field of view of the camera, the downloaded app causing the live video to be generated by controlling the	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "generating a live video of the check in a field of view of the camera, the downloaded app causing the live video to be generated by controlling the camera through the software abstraction layer." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device.

Claims	Prior Art
camera through the software abstraction layer;	Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1

Claims	Prior Art
	ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a

Claims	Prior Art
	wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as "ScanZoom") designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the

Claims	Prior Art
	barcode image. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109.

Claims	Prior Art
	ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a “preview” window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once

Claims	Prior Art
	barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows

Claims	Prior Art
	message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed

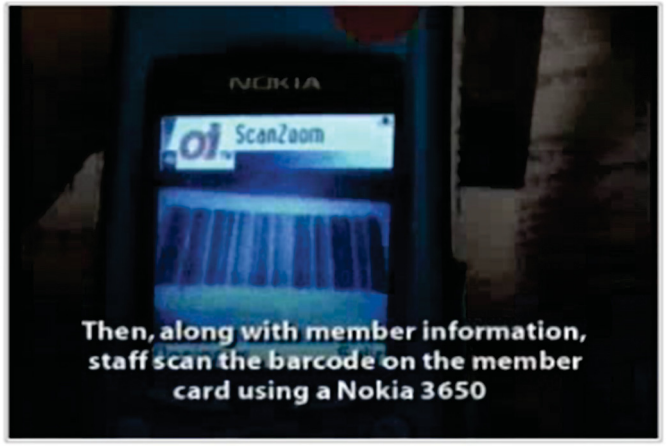
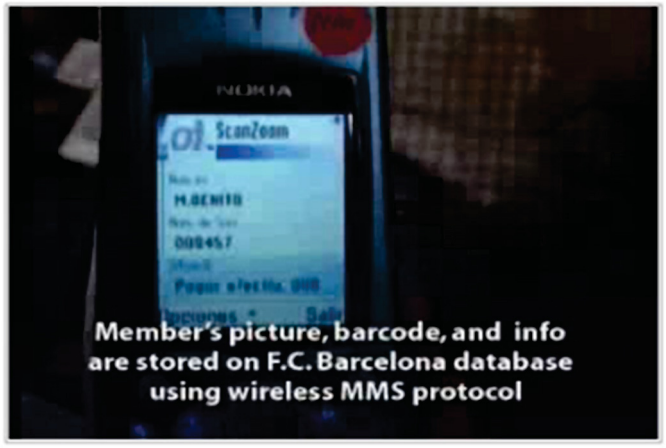
Claims	Prior Art
	using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data.

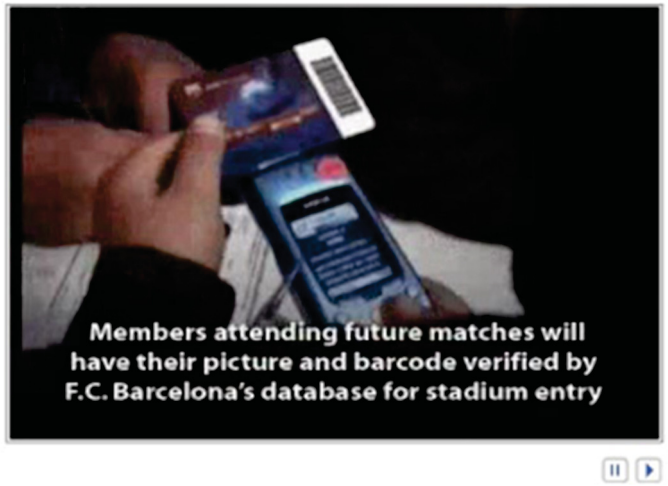
Claims	Prior Art
	ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN2oi bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market."

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

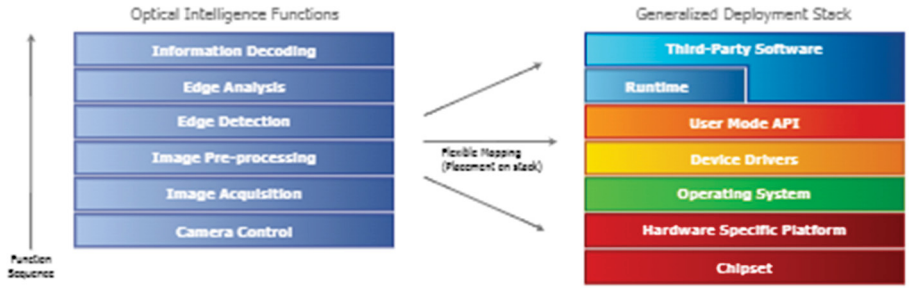
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 1 **INSTALLATION ON DEVICE:** The application can be transferred to the mobile device in the following ways: • Application is embedded in a microchip such as Texas Instrument's OMAP™ 5910 or Intel's XScale™ PXA800F chip. • Application is downloaded and installed from PC using BlueTooth connectivity. • Application is downloaded and installed from website using WAP connectivity on GPRS enabled phones. • Application is transferred from one device to another through SMS, Bluetooth or infrared. ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application**: On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application**: You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services**: You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application**: If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing**: You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE**  ScanZoom (Optical Intelligence) at 2 **SYSTEM REQUIREMENTS:** - Integrated or add-on digital camera (min. resolution of 1.0 MP) - 100kB of memory - 16 MB of RAM - 10 cms tolerance level on camera - Processor: 200 MHz 32-bit ARM processor. It will work on any 32-bit CPU having an ANSI standard C compiler

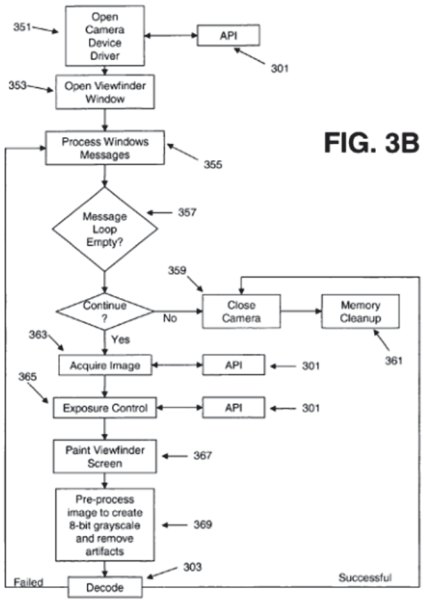
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: • Small-footprint barcode decoding engine • Time and memory efficient • Decode most linear and 2 dimensional barcodes • Support various image formats: BMP, PNG, JPG, YUV

Claims	Prior Art
	ScanZoom (Trifold) at 1 Supported software and operating system platforms: - Symbian 6.x / 7.x - Microsoft Pocket PC 2000 and above - Microsoft Windows CE .NET 4.x - Microsoft Windows 98/2000/XP - Java with MMAPI support (JSR-135, MIDP 1.0/2.0) - BREW (to be released Q2 2004) - PALM v5.0 (to be released Q2 2004) ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.**

Claims	Prior Art
	ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2 Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre]–1[c]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1f] overlaying an alignment guide on the live video of the check in the field of view of the camera;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "overlaying an alignment guide on the live video of the check in the field of view of the camera." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device.

Claims	Prior Art
	Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1

Claims	Prior Art
	ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded

Claims	Prior Art
	on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device

Claims	Prior Art
	105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface ("API") 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a

Claims	Prior Art
	"viewfinder" window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step

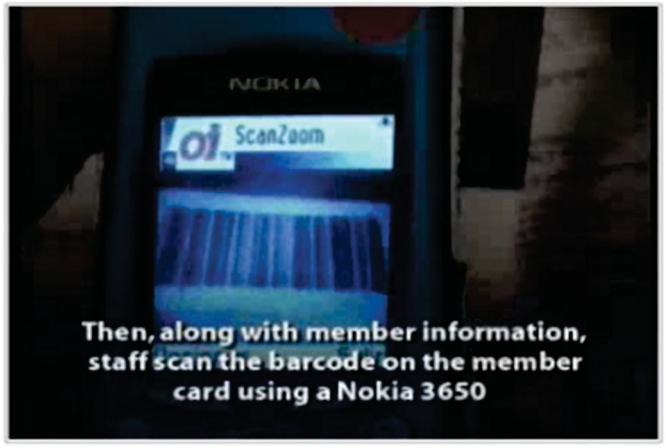
Claims	Prior Art
	361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461.

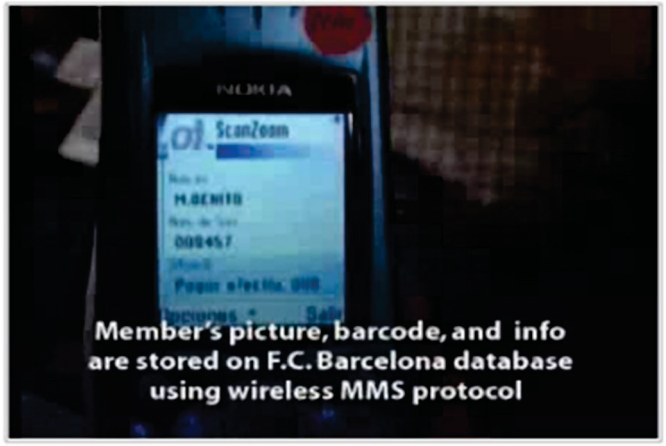
Claims	Prior Art
	ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by

Claims	Prior Art
	ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

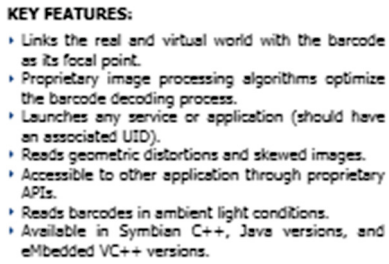
Claims	Prior Art
	ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN20i bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market." ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:01–0:00:05  ScanZoom (Interview Video) at 0:00:07–0:00:11 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55  ScanZoom (Interview Video) at 0:00:55–0:01:25 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Interview Video) at 0:01:33–0:01:46 

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched.

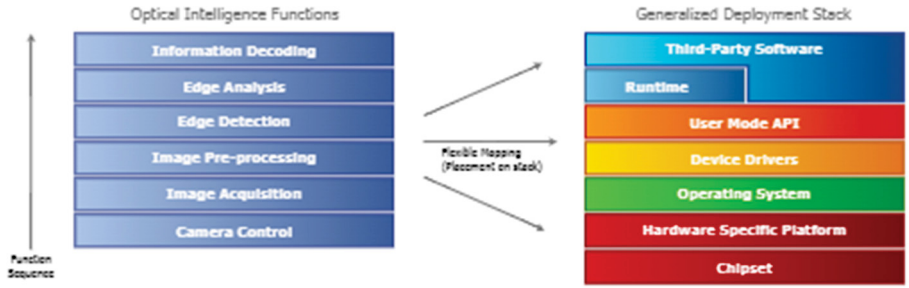
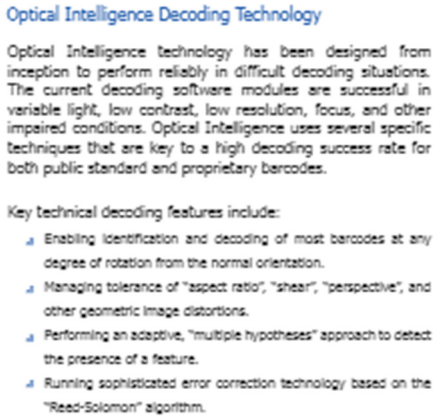
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned. ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices**

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order. ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required.

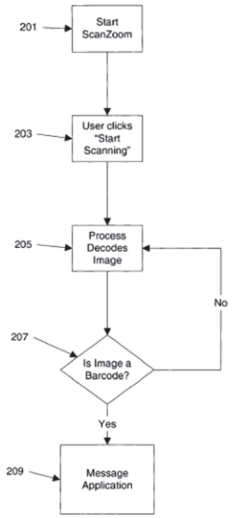
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications.

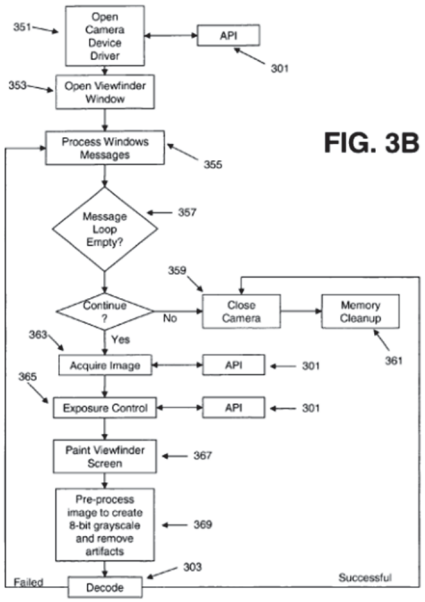
Claims	Prior Art
	ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: • Small-footprint barcode decoding engine • Time and memory efficient • Decode most linear and 2 dimensional barcodes • Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 1 Supported software and operating system platforms: • Symbian 6.x / 7.x • Microsoft Pocket PC 2000 and above • Microsoft Windows CE .NET 4.x • Microsoft Windows 98/2000/XP • Java with MMAPI support (JSR-135, MIDP 1.0/2.0) • BREW (to be released Q2 2004) • PALM v5.0 (to be released Q2 2004) ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms.

Claims	Prior Art
	ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: - Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. - Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. - Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. - Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre]–1[b]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1g] monitoring the live video of the check in the field of view of the camera with respect to at least one monitoring criterion;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "monitoring the live video of the check in the field of view of the camera with respect to at least one monitoring criterion." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device.

Claims	Prior Art
	Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1

Claims	Prior Art
	ScanZoom (Attia) at FIG. 2A  FIG. 2A

Claims	Prior Art
	ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom

Claims	Prior Art
	application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images

Claims	Prior Art
	is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209.

Claims	Prior Art
	ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the

Claims	Prior Art
	camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a

Claims	Prior Art
	photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found.

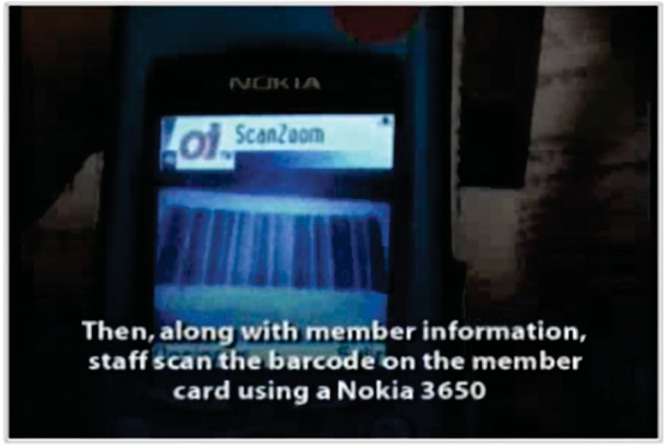
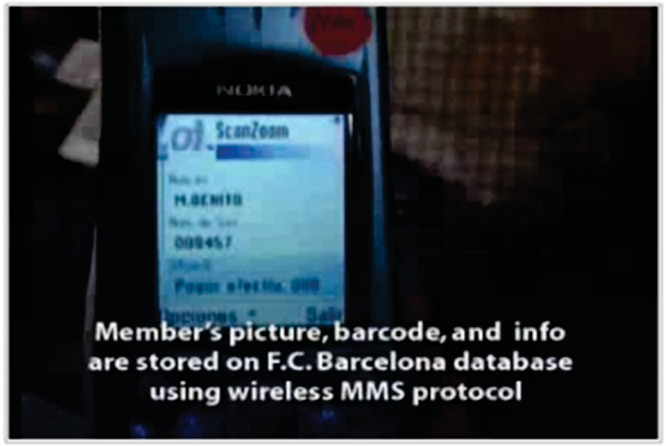
Claims	Prior Art
	ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data.

Claims	Prior Art
	ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN2oi bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market."

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

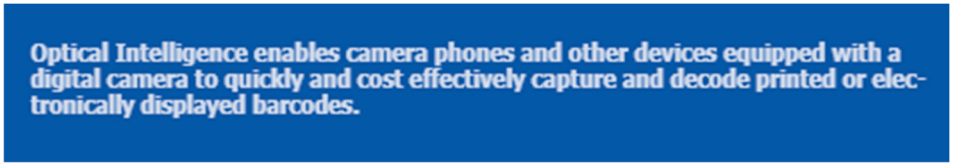
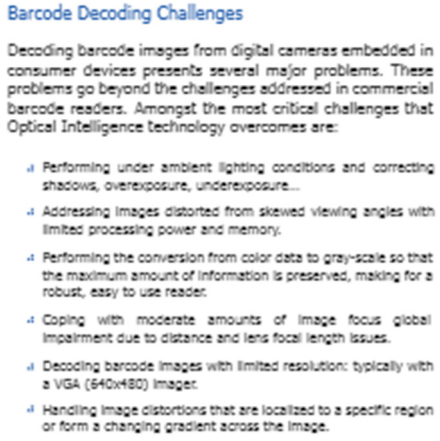
Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

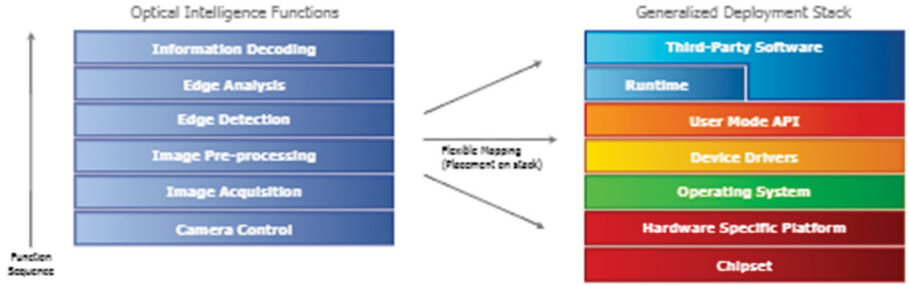
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

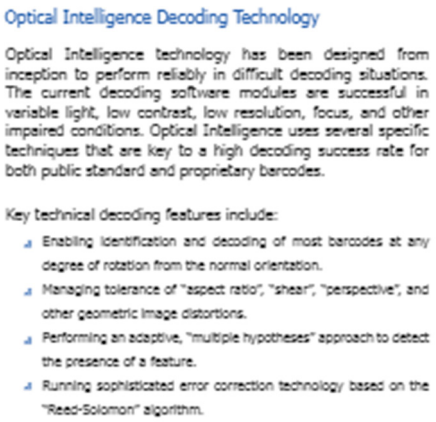
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

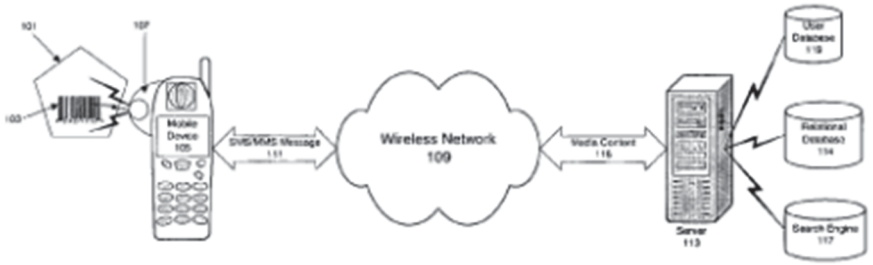
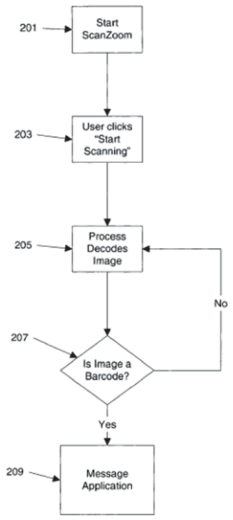
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE**  ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application

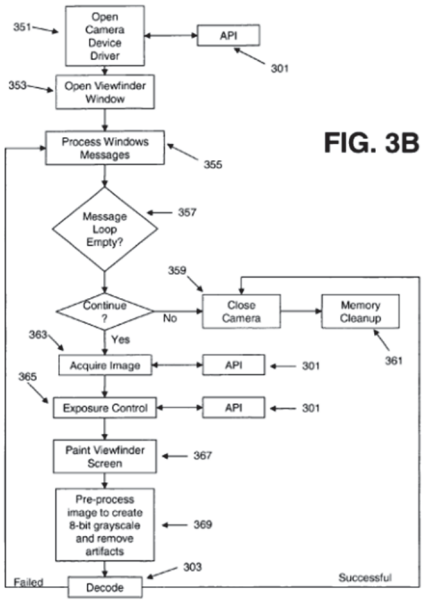
Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 1 Supported software and operating system platforms: - Symbian 6.x / 7.x - Microsoft Pocket PC 2000 and above - Microsoft Windows CE .NET 4.x - Microsoft Windows 98/2000/XP - Java with MMAPI support (JSR-135, MIDP 1.0/2.0) - BREW (to be released Q2 2004) - PALM v5.0 (to be released Q2 2004)

Claims	Prior Art
	ScanZoom (Trifold) at 2  Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2  Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes. ScanZoom (Trifold) at 2  Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: • Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... • Addressing images distorted from skewed viewing angles with limited processing power and memory. • Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. • Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. • Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. • Handling image distortions that are localized to a specific region or form a changing gradient across the image.

Claims	Prior Art
	ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack. ScanZoom (Trifold) at 2 

Claims	Prior Art
	ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre]–1[b], 1[e]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1h] determining that a video frame of the live video of the check satisfies the at least one monitoring criterion and then automatically capturing the video frame;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "determining that a video frame of the live video of the check satisfies the at least one monitoring criterion and then automatically capturing the video frame." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device.

Claims	Prior Art
	ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at FIG. 2A  FIG. 2A

Claims	Prior Art
	ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom

Claims	Prior Art
	application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images

Claims	Prior Art
	is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209.

Claims	Prior Art
	ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the

Claims	Prior Art
	camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for “on-the-fly” decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a

Claims	Prior Art
	photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found.

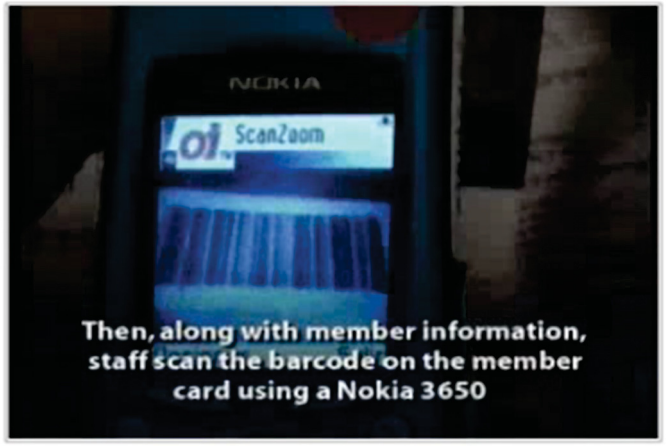
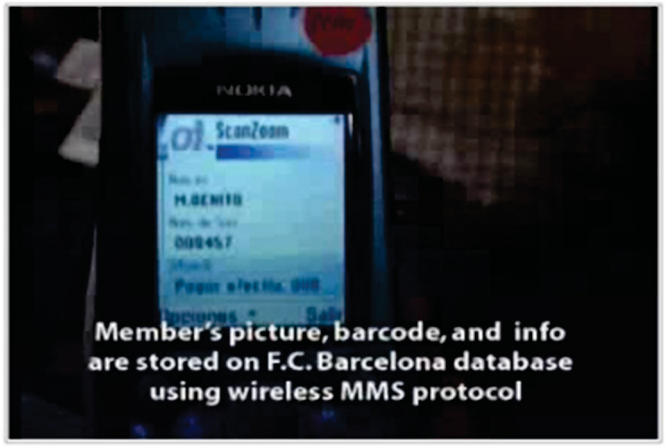
Claims	Prior Art
	ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data.

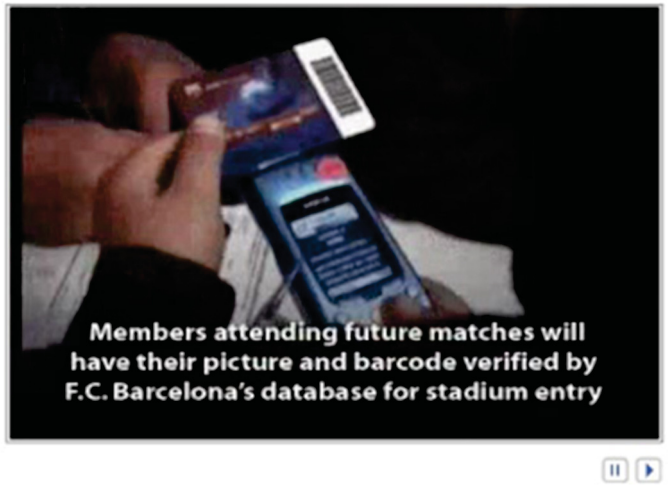
Claims	Prior Art
	ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN2oi bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market."

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

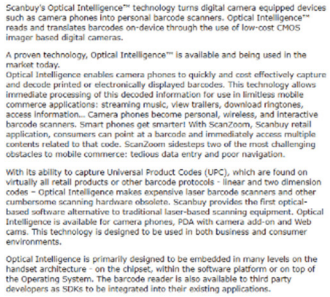
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

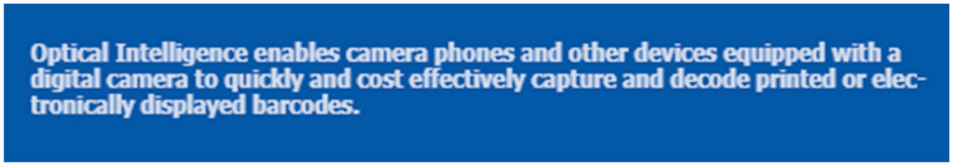
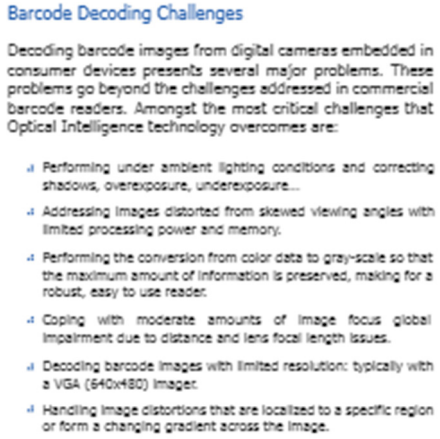
Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

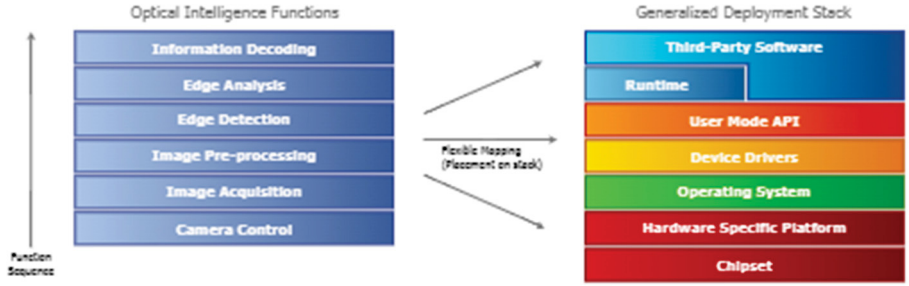
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

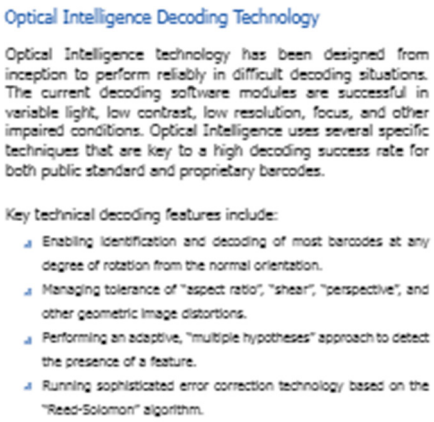
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

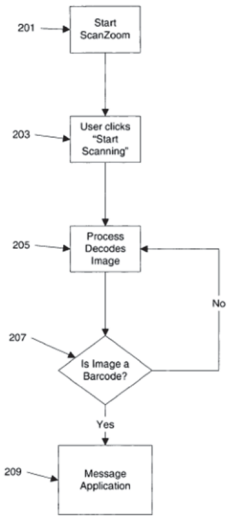
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE**  ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application

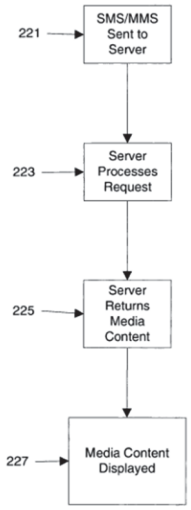
Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1 What is Optical Intelligence?  Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. ScanZoom (Trifold) at 1 Technical Summary: ▪ Small-footprint barcode decoding engine ▪ Time and memory efficient ▪ Decode most linear and 2 dimensional barcodes ▪ Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 1 Supported software and operating system platforms: ▪ Symbian 6.x / 7.x ▪ Microsoft Pocket PC 2000 and above ▪ Microsoft Windows CE .NET 4.x ▪ Microsoft Windows 98/2000/XP ▪ Java with MMAPI support (JSR-135, MIDP 1.0/2.0) ▪ BREW (to be released Q2 2004) ▪ PALM v5.0 (to be released Q2 2004)

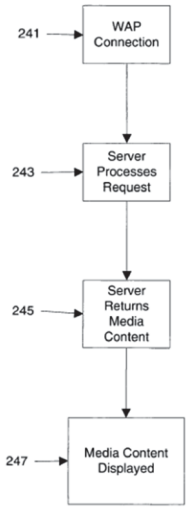
Claims	Prior Art
	ScanZoom (Trifold) at 2  Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2  Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes. ScanZoom (Trifold) at 2  Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: • Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... • Addressing images distorted from skewed viewing angles with limited processing power and memory. • Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. • Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. • Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. • Handling image distortions that are localized to a specific region or form a changing gradient across the image.

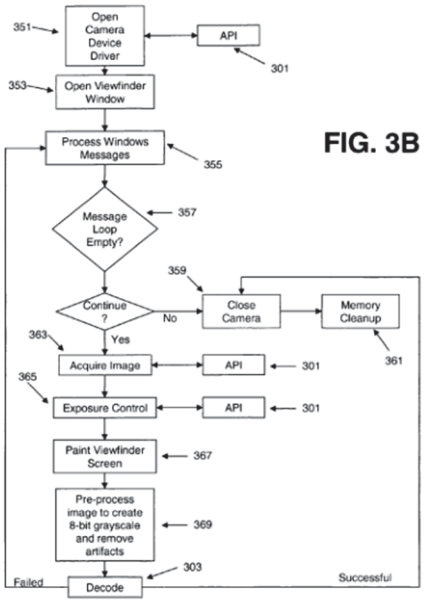
Claims	Prior Art
	ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack. ScanZoom (Trifold) at 2 

Claims	Prior Art
	ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre]–1[b], 1[e], 1[g]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1i] when the video frame of the live video of the check in the field of view of the camera is determined to satisfy the at least one monitoring criterion, providing feedback advising the user that the check has been captured;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "when the video frame of the live video of the check in the field of view of the camera is determined to satisfy the at least one monitoring criterion, providing feedback advising the user that the check has been captured." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device.

Claims	Prior Art
	ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at FIG. 2A  FIG. 2A

Claims	Prior Art
	ScanZoom (Attia) at FIG. 2B  FIG. 2B

Claims	Prior Art
	ScanZoom (Attia) at FIG. 2C  FIG. 2C

Claims	Prior Art
	ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 3:53–67 If ScanZoom sends a MMS message to the server, it launches the MMS Application Id, composes the appropriate message on the fly, and then sends the message to the SMS/MMS server. On the server side, a global system for mobile communications ("GSM") modem connected to the server has the appropriate security identity module ("SIM") card and takes the services from any mobile service provider. The server fetches the MMS message from the GSM modem queue and performs appropriate action depending upon the message. The server can then send back a simple SMS message or can send back a multimedia message service ("MMS") message which can launch a WAP browser on the mobile device and direct it to the appropriate website, or send back information to the user through any other existing wireless protocol. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take

Claims	Prior Art
	another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded

Claims	Prior Art
	on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device

Claims	Prior Art
	105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface ("API") 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a

Claims	Prior Art
	"viewfinder" window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using

Claims	Prior Art
	pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates.

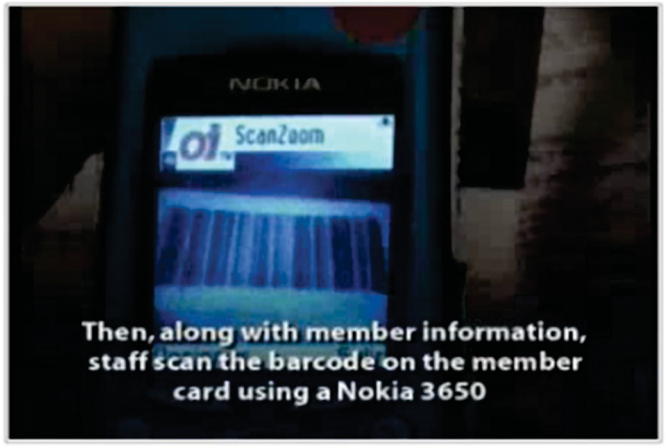
Claims	Prior Art
	ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Attia) at 12:12–23 Each barcode font relies on static tables of values to decode each character. These tables are designed using the bit patterns in the barcode font's specification. Each barcode consists of both dark and light elements. The combination of the dark and light elements and their thickness decides the value of the character. The difference of two consecutive edges provides the width of an element. The widths of the elements are then converted into bit patterns and mapped against the static tables to derive the character value. If a good value is returned then the next set of edges is passed. A bad value signifies that the barcode character could not be decoded. ScanZoom (Attia) at 12:24–32 In many barcode formats, the stop character is used as a check digit to ensure that the barcode has been decoded correctly. Detection engine 303 performs such an integrity check in step 463. If the integrity check fails, detection engine either loads another symbology library in step 455 or attempts to re-decode the image in step 457. If the integrity check is passed in step 463, decoding engine 303 is terminated in

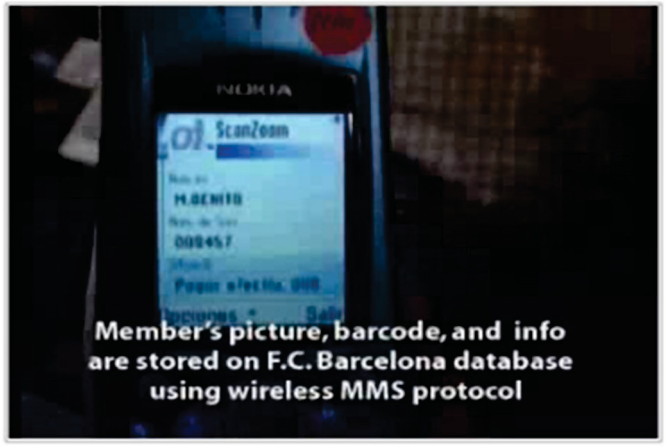
Claims	Prior Art
	step 465 and the barcode data is forwarded to the messaging system (see FIG. 2A, step 209). ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by

Claims	Prior Art
	ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

Claims	Prior Art
	ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN20i bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market." ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:01–0:00:05  ScanZoom (Interview Video) at 0:00:07–0:00:11 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55  ScanZoom (Interview Video) at 0:00:55–0:01:25 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Interview Video) at 0:01:33–0:01:46 

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched.

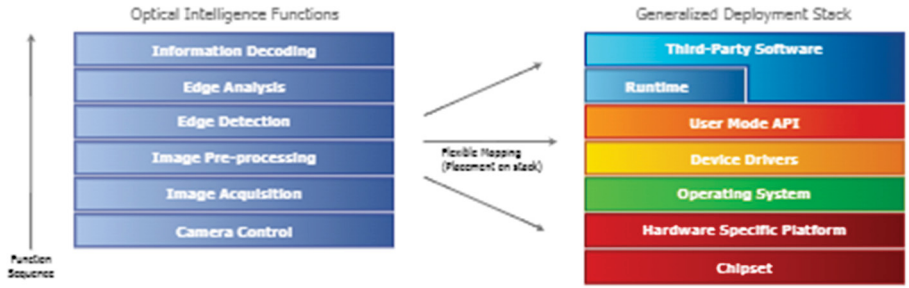
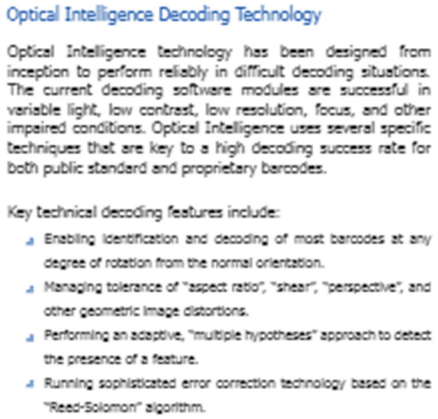
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned. ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices**

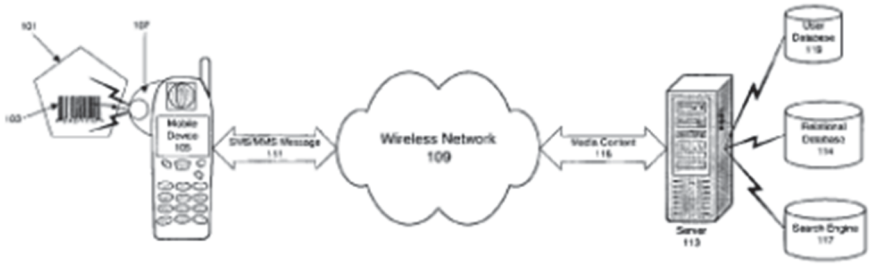
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application**: On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application**: You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services**: You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application**: If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing**: You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order. ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required.

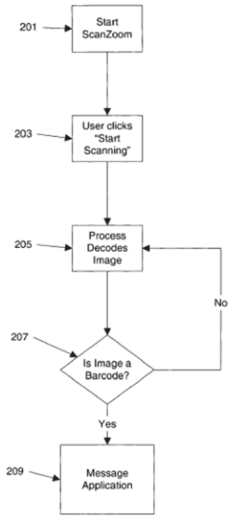
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications.

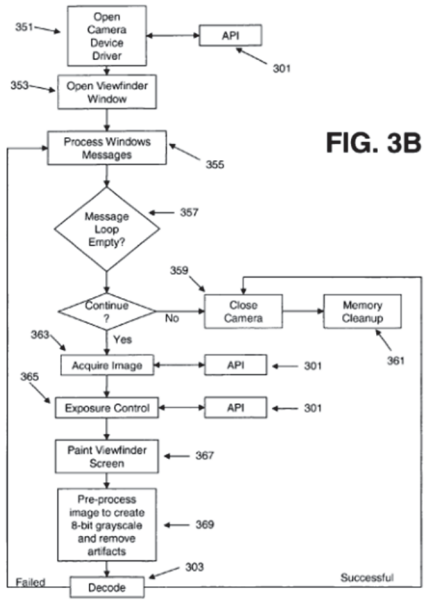
Claims	Prior Art
	ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 1 Supported software and operating system platforms: - Symbian 6.x / 7.x - Microsoft Pocket PC 2000 and above - Microsoft Windows CE .NET 4.x - Microsoft Windows 98/2000/XP - Java with MMAPI support (JSR-135, MIDP 1.0/2.0) - BREW (to be released Q2 2004) - PALM v5.0 (to be released Q2 2004) ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms.

Claims	Prior Art
	ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: - Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. - Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. - Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. - Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre]–1[b], 1[e], 1[g], 1[h]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1j] using a wireless network, transmitting a digital image of the check from the user's mobile device and submitting the check for mobile check deposit in the	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "using a wireless network, transmitting a digital image of the check from the user's mobile device and submitting the check for mobile check deposit in the bank after automatically capturing the video frame, wherein the digital image is the captured video frame or is based on the captured video frame." For example:

Claims	Prior Art
bank after automatically capturing the video frame, wherein the digital image is the captured video frame or is based on the captured video frame; and	ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1

Claims	Prior Art
	ScanZoom (Attia) at FIG. 2A  FIG. 2A

Claims	Prior Art
	ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 3:53–67 If ScanZoom sends a MMS message to the server, it launches the MMS Application Id, composes the appropriate message on the fly, and then sends the message to the SMS/MMS server. On the server side, a global system for mobile communications ("GSM") modem connected to the server has the appropriate security identity module ("SIM") card and takes the services from any mobile service provider. The server fetches the MMS message from the GSM modem queue and performs appropriate action depending upon the message. The server can then send back a simple SMS message or can send back a multimedia message service ("MMS") message which can launch a WAP browser on the mobile device and direct it to the appropriate website, or send back information to the user through any other existing wireless protocol. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take

Claims	Prior Art
	another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded

Claims	Prior Art
	on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device

Claims	Prior Art
	105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface ("API") 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a

Claims	Prior Art
	"viewfinder" window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using

Claims	Prior Art
	pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates.

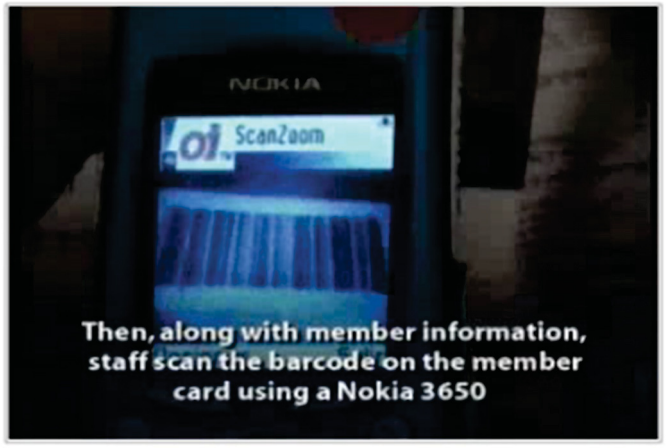
Claims	Prior Art
	ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Brochure) at 1  Various Possible Applications

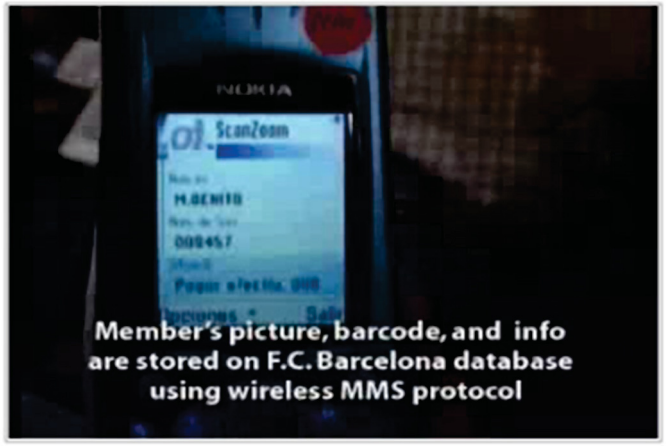
Claims	Prior Art
	ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

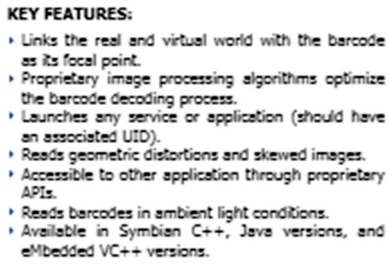
Claims	Prior Art
	ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN20i bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market." ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:01–0:00:05  ScanZoom (Interview Video) at 0:00:07–0:00:11 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55  ScanZoom (Interview Video) at 0:00:55–0:01:25 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Interview Video) at 0:01:33–0:01:46 

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched.

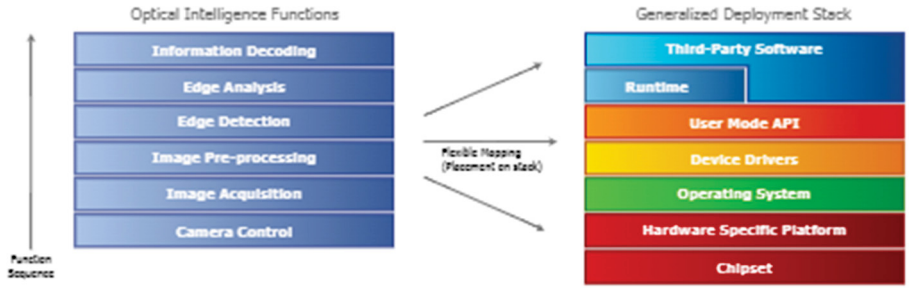
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned. ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices**

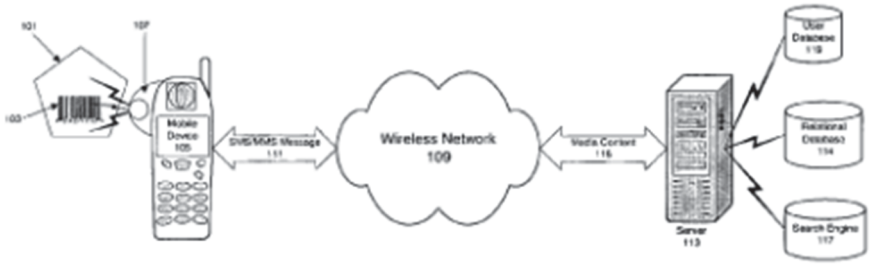
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order. ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications.

Claims	Prior Art
	ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 1 Supported software and operating system platforms: - Symbian 6.x / 7.x - Microsoft Pocket PC 2000 and above - Microsoft Windows CE .NET 4.x - Microsoft Windows 98/2000/XP - Java with MMAPI support (JSR-135, MIDP 1.0/2.0) - BREW (to be released Q2 2004) - PALM v5.0 (to be released Q2 2004) ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms.

Claims	Prior Art
	ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2 Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: - Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. - Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. - Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. - Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre], 1[e], 1[i]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1k] confirming that the mobile check deposit can go forward after optical character recognition is performed on the check in the digital image, a magnetic ink	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "confirming that the mobile check deposit can go forward after optical character recognition is performed on the check in the digital image, a magnetic ink character recognition (MICR) line on the check in the digital image is recognized, and an amount payable on the check in the digital image is validated." For example:

Claims	Prior Art
character recognition (MICR) line on the check in the digital image is recognized, and an amount payable on the check in the digital image is validated;	ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about

Claims	Prior Art
	the scanned product. These programs provide a link between the physical and online world which previously did not exist. ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale.

Claims	Prior Art
	ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as "ScanZoom") designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for

Claims	Prior Art
	decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera

Claims	Prior Art
	connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be

Claims	Prior Art
	redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of

Claims	Prior Art
	mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for “on-the-fly” decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated.

Claims	Prior Art
	ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark).

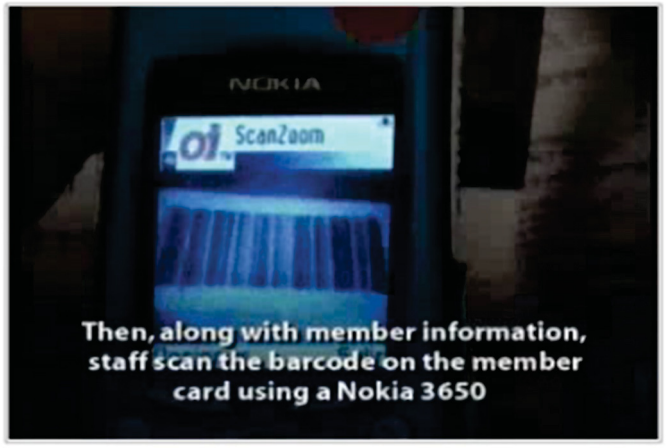
Claims	Prior Art
	ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Attia) at 12:12–23 Each barcode font relies on static tables of values to decode each character. These tables are designed using the bit patterns in the barcode font's specification. Each barcode consists of both dark and light elements. The combination of the dark and light elements and their thickness decides the value of the character. The difference of two consecutive edges provides the width of an element. The widths of the elements are then converted into bit patterns and mapped against the static tables to derive the character value. If a good value is returned then the next set of edges is passed. A bad value signifies that the

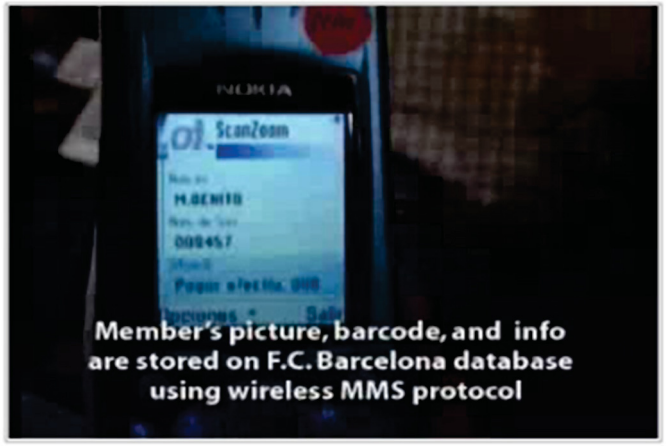
Claims	Prior Art
	barcode character could not be decoded. ScanZoom (Attia) at 12:24–32 In many barcode formats, the stop character is used as a check digit to ensure that the barcode has been decoded correctly. Detection engine 303 performs such an integrity check in step 463. If the integrity check fails, detection engine either loads another symbology library in step 455 or attempts to re-decode the image in step 457. If the integrity check is passed in step 463, decoding engine 303 is terminated in step 465 and the barcode data is forwarded to the messaging system (see FIG. 2A, step 209). ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes

Claims	Prior Art
	ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

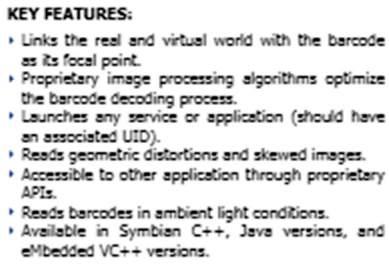
Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:01–0:00:05  ScanZoom (Interview Video) at 0:00:07–0:00:11 

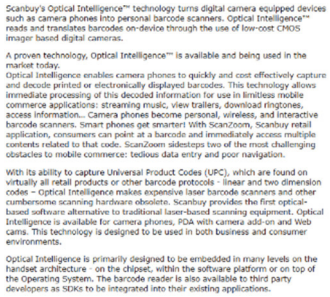
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55  ScanZoom (Interview Video) at 0:00:55–0:01:25 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Interview Video) at 0:01:33–0:01:46 

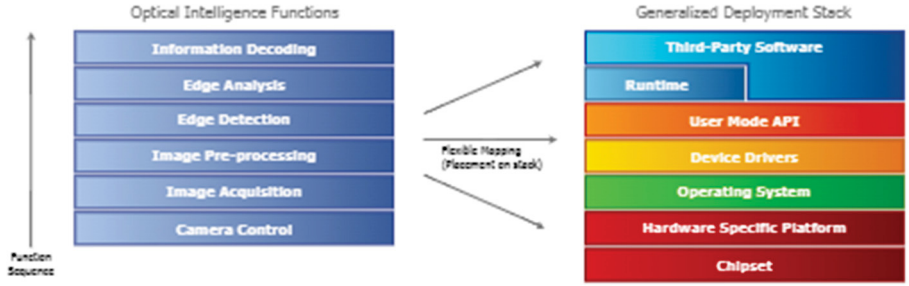
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched.

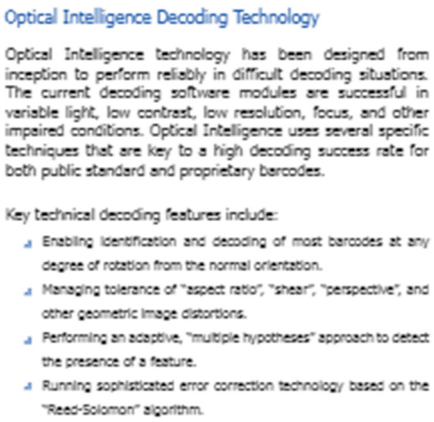
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned. ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices**

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order. ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.

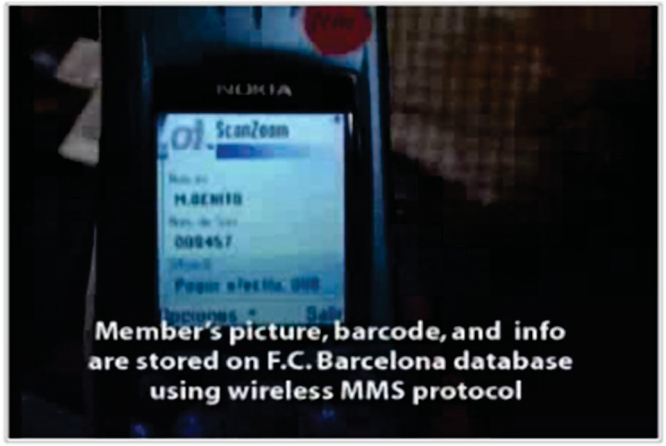
Claims	Prior Art
	ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image.

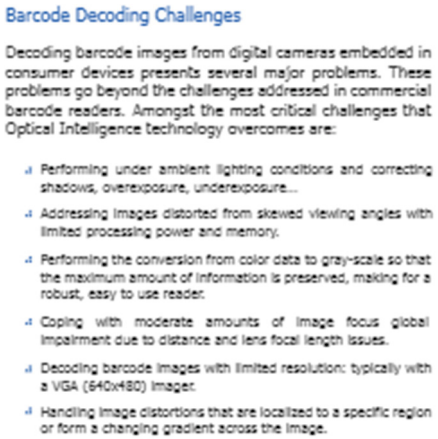
Claims	Prior Art
	ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack. ScanZoom (Trifold) at 2 

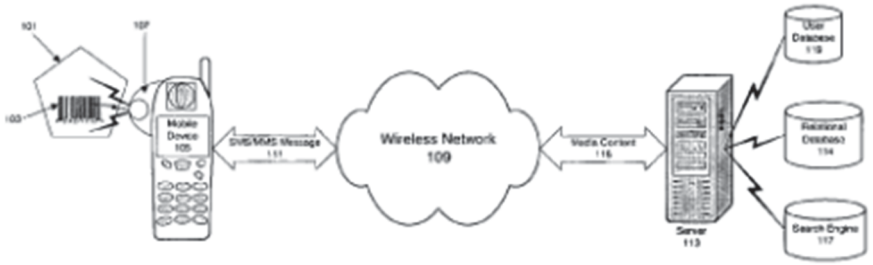
Claims	Prior Art
	ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitation 1[pre]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1l] a server, remote from the user's mobile device, comprising a processor coupled to a memory storing Instructions that, when executed by the processor, cause the server to perform operations including:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a server, remote from the user's mobile device, comprising a processor coupled to a memory storing Instructions that, when executed by the processor, cause the server to perform operations including." For example: ScanZoom (Attia) at 3:53–67 If ScanZoom sends a MMS message to the server, it launches the MMS Application Id, composes the appropriate message on the fly, and then sends the message to the SMS/MMS server. On the server side, a global system for mobile communications ("GSM") modem connected to the server has the appropriate security identity module ("SIM") card and takes the services from any mobile service provider. The server fetches the MMS message from the GSM modem queue and performs appropriate action depending upon the message. The server can then send back a simple SMS message or can send back a multimedia message service ("MMS") message which can launch a WAP browser on the mobile device and direct it to the appropriate website, or send back information to the user through any other existing wireless protocol.

Claims	Prior Art
	ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the

Claims	Prior Art
	camera's active memory in step 361. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Optical Intelligence) at 1 

Claims	Prior Art
	ScanZoom (Trifold) at 2  Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: • Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... • Addressing images distorted from skewed viewing angles with limited processing power and memory. • Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. • Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. • Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. • Handling image distortions that are localized to a specific region or form a changing gradient across the image. *See also* limitation 1[pre]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1m] receiving the digital image of the check transmitted by the user's mobile device, and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "receiving the digital image of the check transmitted by the user's mobile device." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device.

Claims	Prior Art
	ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants ("PDAs"), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist. ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial

Claims	Prior Art
	products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the

Claims	Prior Art
	cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 3:53–67 If ScanZoom sends a MMS message to the server, it launches the MMS Application Id, composes the appropriate message on the fly, and then sends the message to the SMS/MMS server. On the server side, a global system for mobile communications ("GSM") modem connected to the server has the appropriate security identity module ("SIM") card and takes the services from any mobile service provider. The server fetches the MMS message from the GSM modem queue and performs appropriate action depending upon the message. The server can then send back a simple SMS message or can send back a multimedia message service ("MMS") message which can launch a WAP browser on the mobile device and direct it to the appropriate website, or send back information to the user through any other existing wireless protocol. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera

Claims	Prior Art
	connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be

Claims	Prior Art
	redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of

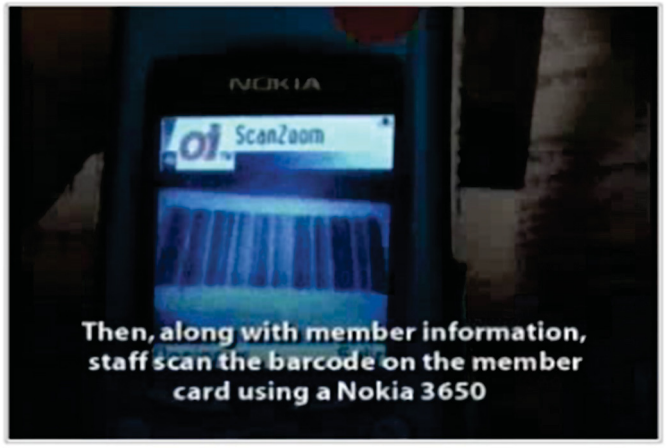
Claims	Prior Art
	mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for “on-the-fly” decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated.

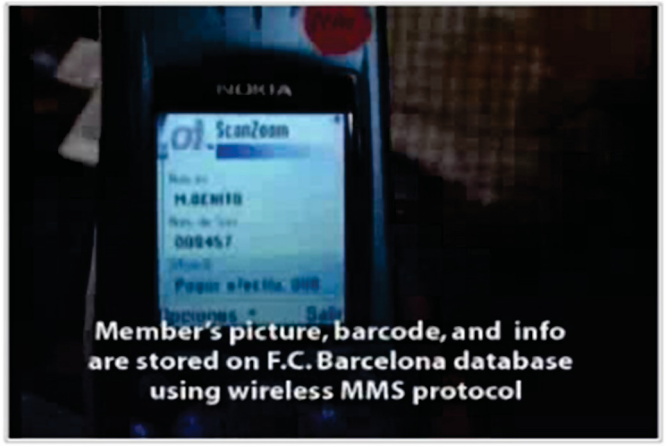
Claims	Prior Art
	ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes

Claims	Prior Art
	ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

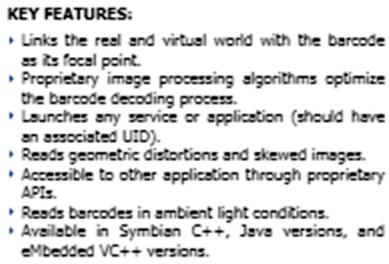
Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:01–0:00:05  ScanZoom (Interview Video) at 0:00:07–0:00:11 

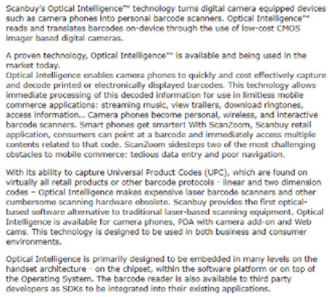
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55  ScanZoom (Interview Video) at 0:00:55–0:01:25 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Interview Video) at 0:01:33–0:01:46 

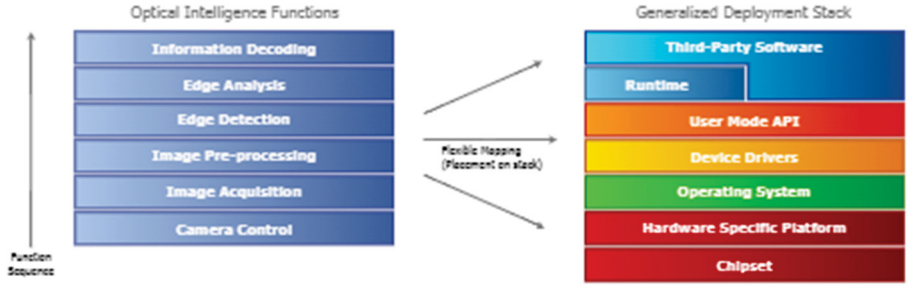
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched.

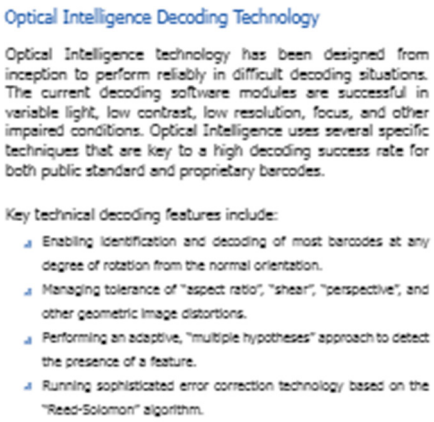
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned. ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices**

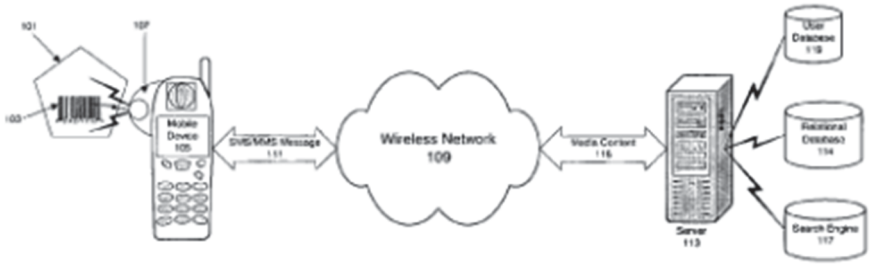
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order. ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.

Claims	Prior Art
	ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image.

Claims	Prior Art
	ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack. ScanZoom (Trifold) at 2 

Claims	Prior Art
	ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre], 1[j], 1[l]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1n] processing the digital image of the check including performing optical character recognition on the check in the digital image and verifying that the digital image of the check is acceptable for mobile check deposit, the user's mobile device receiving an Indication of a result of the server's processing before confirming that the mobile check deposit can go forward; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "processing the digital image of the check including performing optical character recognition on the check in the digital image and verifying that the digital image of the check is acceptable for mobile check deposit, the user's mobile device receiving an Indication of a result of the server's processing before confirming that the mobile check deposit can go forward." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device.

Claims	Prior Art
	ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants ("PDAs"), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist. ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial

Claims	Prior Art
	products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately

Claims	Prior Art
	and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as "ScanZoom") designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding.

Claims	Prior Art
	ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone,

Claims	Prior Art
	mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the

Claims	Prior Art
	barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface ("API") 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through

Claims	Prior Art
	all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a "viewfinder" window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed.

Claims	Prior Art
	ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and

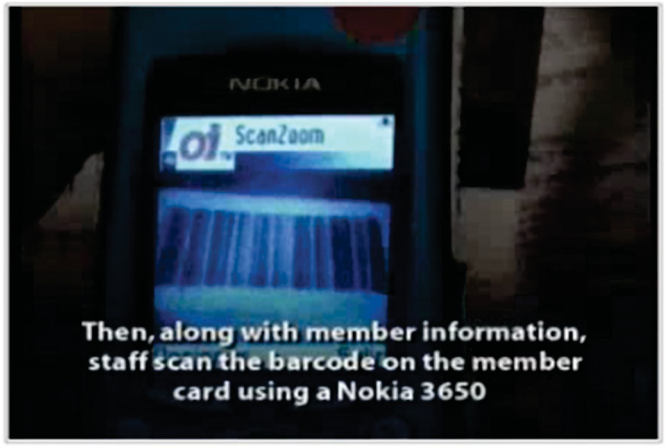
Claims	Prior Art
	the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Attia) at 12:12–23 Each barcode font relies on static tables of values to decode each character. These tables are designed using the bit patterns in the barcode font's specification. Each barcode consists of both dark and light elements. The combination of the dark and light elements and their thickness decides the value of the character. The difference of two consecutive edges provides the width of an element. The widths of the elements are then converted into bit patterns and mapped against the static tables to derive the character value. If a good value is returned then the next set of edges is passed. A bad value signifies that the barcode character could not be decoded. ScanZoom (Attia) at 12:24–32 In many barcode formats, the stop character is used as a check digit to ensure that the barcode has been decoded correctly. Detection engine 303 performs such an integrity check in step 463. If the integrity

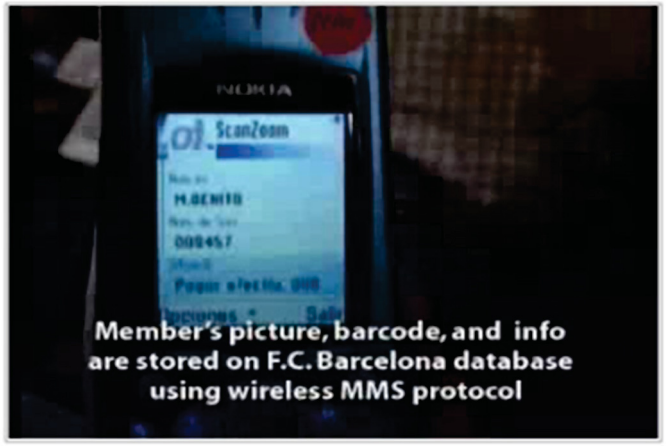
Claims	Prior Art
	check fails, detection engine either loads another symbology library in step 455 or attempts to re-decode the image in step 457. If the integrity check is passed in step 463, decoding engine 303 is terminated in step 465 and the barcode data is forwarded to the messaging system (see FIG. 2A, step 209). ScanZoom (Brochure) at 1  **Various Possible Applications** ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data.

Claims	Prior Art
	ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

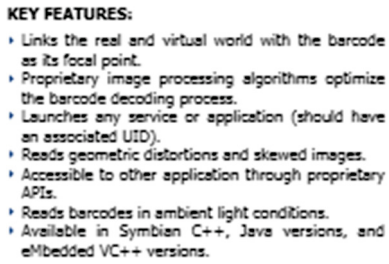
Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:01–0:00:05  ScanZoom (Interview Video) at 0:00:07–0:00:11 

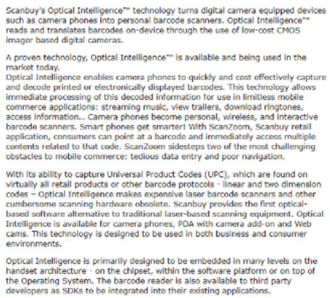
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55  ScanZoom (Interview Video) at 0:00:55–0:01:25 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Interview Video) at 0:01:33–0:01:46 

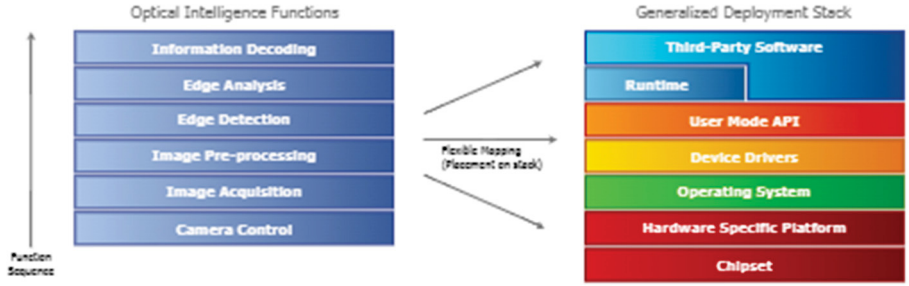
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched.

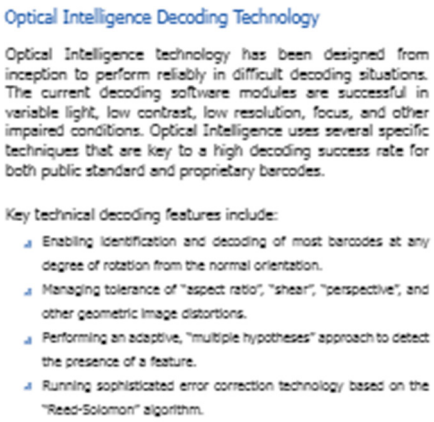
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned. ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices**

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order. ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.

Claims	Prior Art
	ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image.

Claims	Prior Art
	ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack. ScanZoom (Trifold) at 2 

Claims	Prior Art
	ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre], 1[k], 1[l]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[1o] a computer comprising a processor coupled to a memory storing Instructions that, when executed by the processor, cause the computer to update a balance of an account at a financial institution of the user to reflect an amount of funds associated with the check submitted for mobile check deposit by the user's mobile device, after the submitting the check for mobile check deposit in the bank, the confirming that the mobile check deposit can go forward, and the verifying that the	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a computer comprising a processor coupled to a memory storing Instructions that, when executed by the processor, cause the computer to update a balance of an account at a financial institution of the user to reflect an amount of funds associated with the check submitted for mobile check deposit by the user's mobile device, after the submitting the check for mobile check deposit in the bank, the confirming that the mobile check deposit can go forward, and the verifying that the digital image of the check is acceptable for mobile check deposit." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to

Claims	Prior Art
digital image of the check is acceptable for mobile check deposit.	the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist. ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which

Claims	Prior Art
	was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems.

Claims	Prior Art
	ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as "ScanZoom") designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 3:53–67 If ScanZoom sends a MMS message to the server, it launches the MMS Application Id, composes the appropriate message on the fly, and then sends the message to the SMS/MMS server. On the server side, a

Claims	Prior Art
	global system for mobile communications ("GSM") modem connected to the server has the appropriate security identity module ("SIM") card and takes the services from any mobile service provider. The server fetches the MMS message from the GSM modem queue and performs appropriate action depending upon the message. The server can then send back a simple SMS message or can send back a multimedia message service ("MMS") message which can launch a WAP browser on the mobile device and direct it to the appropriate website, or send back information to the user through any other existing wireless protocol. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned

Claims	Prior Art
	item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103.

Claims	Prior Art
	ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed

Claims	Prior Art
	by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired

Claims	Prior Art
	automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't

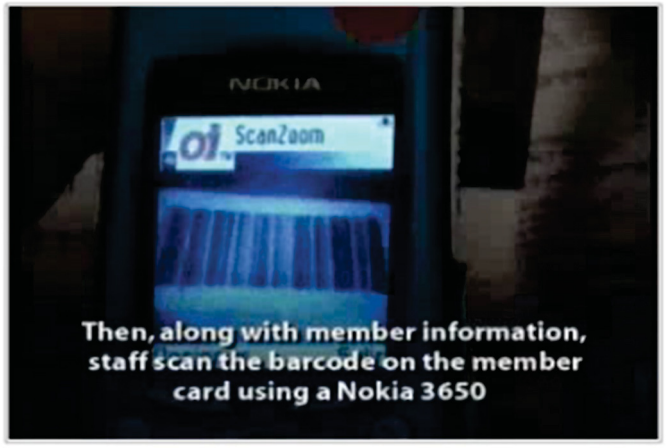
Claims	Prior Art
	of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Attia) at 12:12–23 Each barcode font relies on static tables of values to decode each character. These tables are designed using the bit patterns in the barcode font's specification. Each barcode consists of both dark and light

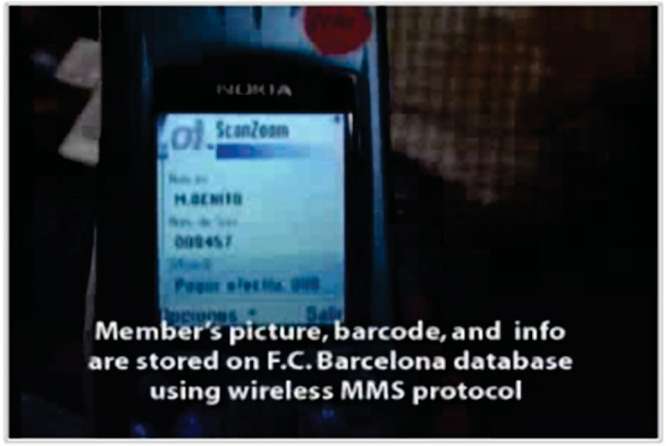
Claims	Prior Art
	elements. The combination of the dark and light elements and their thickness decides the value of the character. The difference of two consecutive edges provides the width of an element. The widths of the elements are then converted into bit patterns and mapped against the static tables to derive the character value. If a good value is returned then the next set of edges is passed. A bad value signifies that the barcode character could not be decoded. ScanZoom (Attia) at 12:24–32 In many barcode formats, the stop character is used as a check digit to ensure that the barcode has been decoded correctly. Detection engine 303 performs such an integrity check in step 463. If the integrity check fails, detection engine either loads another symbology library in step 455 or attempts to re-decode the image in step 457. If the integrity check is passed in step 463, decoding engine 303 is terminated in step 465 and the barcode data is forwarded to the messaging system (see FIG. 2A, step 209). ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes

Claims	Prior Art
	ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

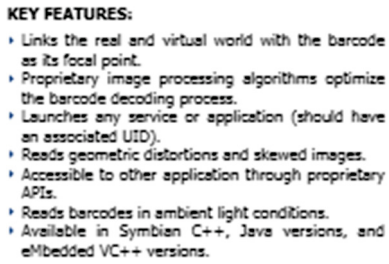
Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:01–0:00:05  ScanZoom (Interview Video) at 0:00:07–0:00:11 

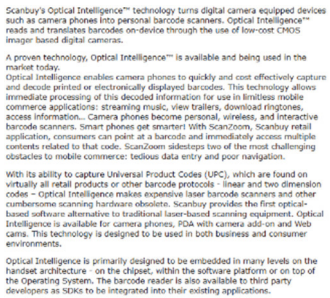
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55  ScanZoom (Interview Video) at 0:00:55–0:01:25 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Interview Video) at 0:01:33–0:01:46 

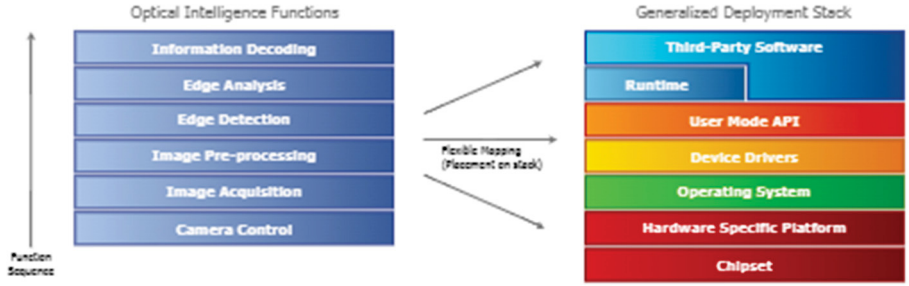
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched.

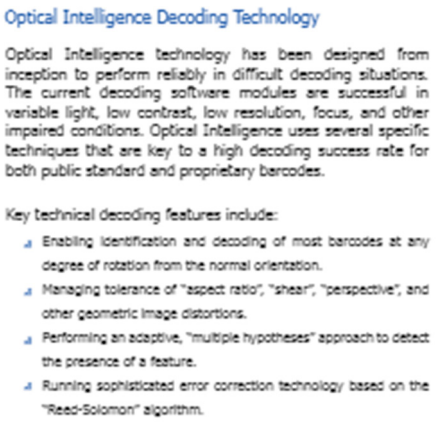
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned. ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices**

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order. ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required.

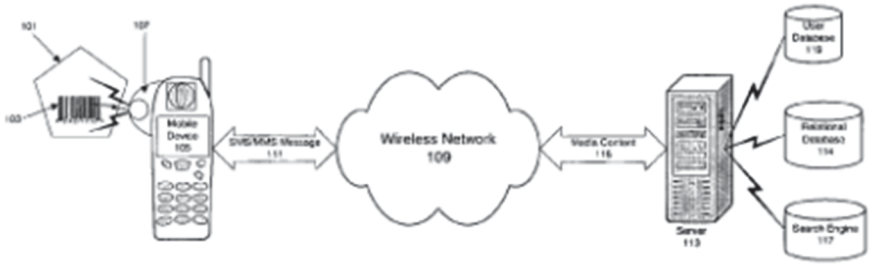
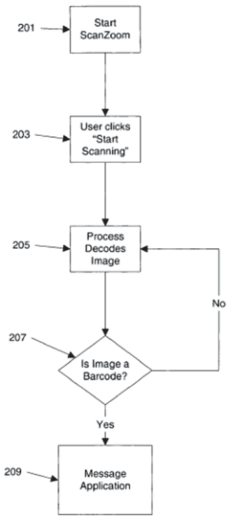
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.

Claims	Prior Art
	ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image.

Claims	Prior Art
	ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack. ScanZoom (Trifold) at 2 

Claims	Prior Art
	ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[pre], 1[kj]–1[l], 1[n]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
2[pre]. The system of claim 1, wherein the downloaded app causes the user's mobile device to perform additional operations including:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 1, wherein the downloaded app causes the user's mobile device to perform additional operations including." For example: *See* limitations 1[pre], 1[a]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[2a] before determining that the video frame of the live video of the check satisfies the at least one monitoring criterion, determining that a different video frame of the live video of the check does not	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "before determining that the video frame of the live video of the check satisfies the at least one monitoring criterion, determining that a different video frame of the live video of the check does not satisfy the at least one monitoring criterion." For example: *See* limitations 1[pre]-1[b], 1[e], 1[g], 1[h], 2[pre].

Claims	Prior Art
satisfy the at least one monitoring criterion; and	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[2b] after determining that the different video frame of the live video of the check does not satisfy the at least one monitoring criterion, providing feedback to the user.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "after determining that the different video frame of the live video of the check does not satisfy the at least one monitoring criterion, providing feedback to the user." For example: *See* limitations 1[pre]-1[b], 1[e], 1[g]-1[i], 2[pre], 2[a]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
3. The system of claim 1, wherein the at least one monitoring criterion is a plurality of monitoring criteria based on two or more selected from a group consisting of light contrast, light brightness, check positioning, check dimensions, character spacing, skewing, warping, corner detection, edge detection, and magnetic ink character recognition (MICR) line detection.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 1, wherein the at least one monitoring criterion is a plurality of monitoring criteria based on two or more selected from a group consisting of light contrast, light brightness, check positioning, check dimensions, character spacing, skewing, warping, corner detection, edge detection, and magnetic ink character recognition (MICR) line detection." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device.

Claims	Prior Art
	ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at FIG. 2A  FIG. 2A ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have

Claims	Prior Art
	become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants ("PDAs"), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist. ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor.

Claims	Prior Art
	ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets. ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom

Claims	Prior Art
	software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode.

Claims	Prior Art
	ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited

Claims	Prior Art
	to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function

Claims	Prior Art
	properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface ("API") 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a "viewfinder" window to open on mobile device 105's display in step 353. This allows the user to make

Claims	Prior Art
	sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition.

Claims	Prior Art
	ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and

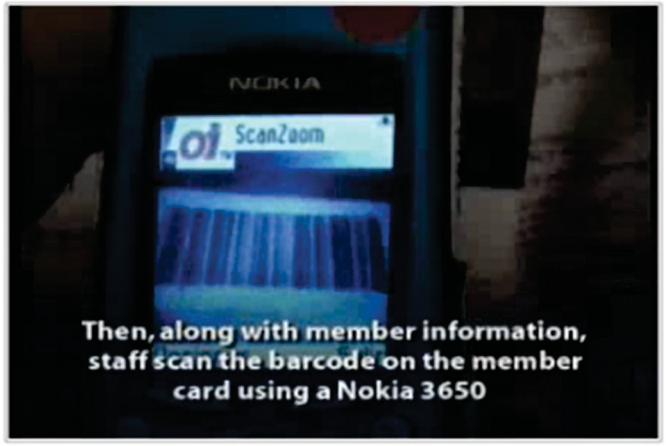
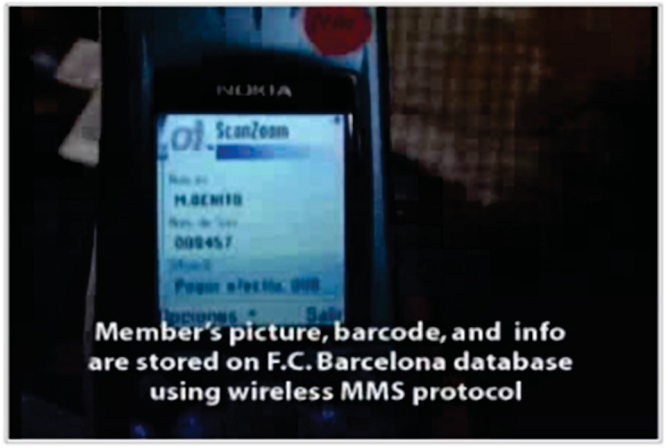
Claims	Prior Art
	repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Attia) at 12:12–23 Each barcode font relies on static tables of values to decode each character. These tables are designed using the bit patterns in the barcode font's specification. Each barcode consists of both dark and light elements. The combination of the dark and light elements and their thickness decides the value of the character. The difference of two consecutive edges provides the width of an element. The widths of the elements are then converted into bit patterns and mapped against the static tables to derive the character value. If a good value is returned then the next set of edges is passed. A bad value signifies that the barcode character could not be decoded. ScanZoom (Attia) at 12:24–32 In many barcode formats, the stop character is used as a check digit to ensure that the barcode has been decoded correctly. Detection engine 303 performs such an integrity check in step 463. If the integrity check fails, detection engine either loads another symbology library in step 455 or attempts to re-decode the image in step 457. If the integrity check is passed in step 463, decoding engine 303 is terminated in step 465 and the barcode data is forwarded to the messaging system (see FIG. 2A, step 209).

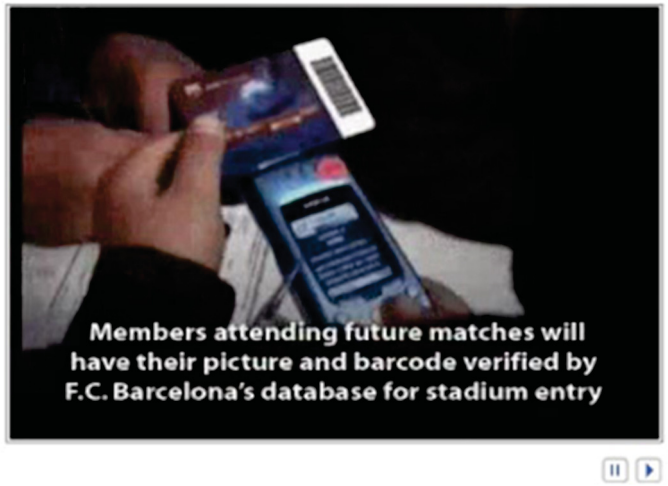
Claims	Prior Art
	ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by

Claims	Prior Art
	ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

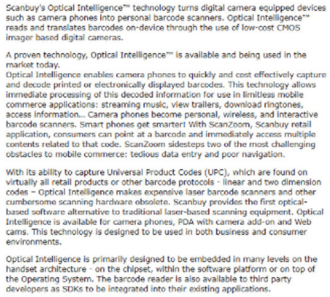
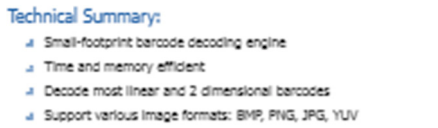
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

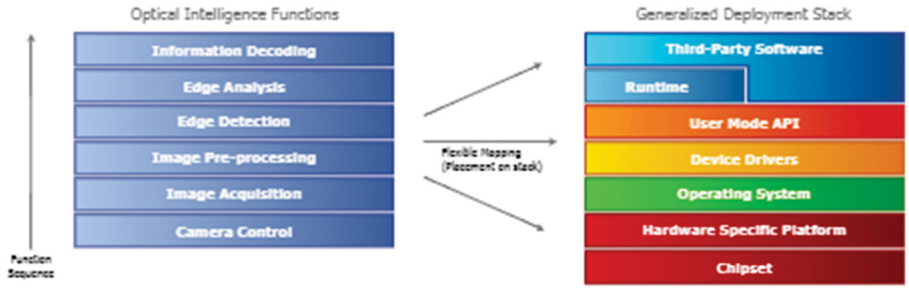
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

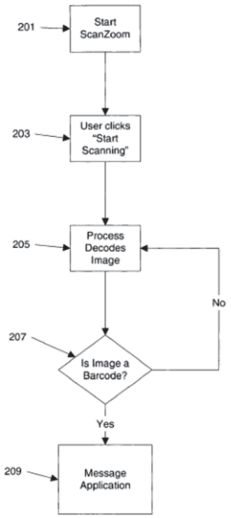
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE** 

Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. ScanZoom (Trifold) at 1  Technical Summary: ▪ Small-footprint barcode decoding engine ▪ Time and memory efficient ▪ Decode most linear and 2 dimensional barcodes ▪ Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2  Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms.

Claims	Prior Art
	ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2 Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Read-Solomon" algorithm. *See also* limitations 1[pre]–1[b], 1[e], 1[g]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
4. The system of claim 3, wherein the plurality of monitoring criteria Includes a criterion based on magnetic ink character recognition (MICR) line detection.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 3, wherein the plurality of monitoring criteria Includes a criterion based on magnetic ink character recognition (MICR) line detection." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device.

Claims	Prior Art
	Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1

Claims	Prior Art
	ScanZoom (Attia) at FIG. 2A  FIG. 2A ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants ("PDAs"), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom

Claims	Prior Art
	application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images

Claims	Prior Art
	is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209.

Claims	Prior Art
	ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the

Claims	Prior Art
	camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for “on-the-fly” decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or

Claims	Prior Art
	conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459

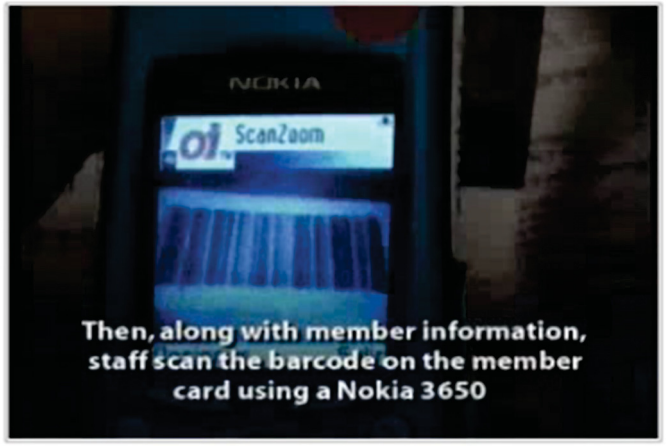
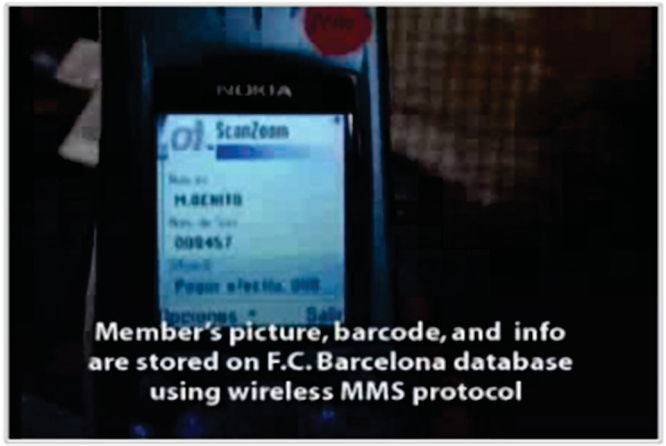
Claims	Prior Art
	and the stop character of the barcode in step 461. ScanZoom (Attia) at 12:12–23 Each barcode font relies on static tables of values to decode each character. These tables are designed using the bit patterns in the barcode font's specification. Each barcode consists of both dark and light elements. The combination of the dark and light elements and their thickness decides the value of the character. The difference of two consecutive edges provides the width of an element. The widths of the elements are then converted into bit patterns and mapped against the static tables to derive the character value. If a good value is returned then the next set of edges is passed. A bad value signifies that the barcode character could not be decoded. ScanZoom (Attia) at 12:24–32 In many barcode formats, the stop character is used as a check digit to ensure that the barcode has been decoded correctly. Detection engine 303 performs such an integrity check in step 463. If the integrity check fails, detection engine either loads another symbology library in step 455 or attempts to re-decode the image in step 457. If the integrity check is passed in step 463, decoding engine 303 is terminated in step 465 and the barcode data is forwarded to the messaging system (see FIG. 2A, step 209). ScanZoom (Brochure) at 1  Various Possible Applications

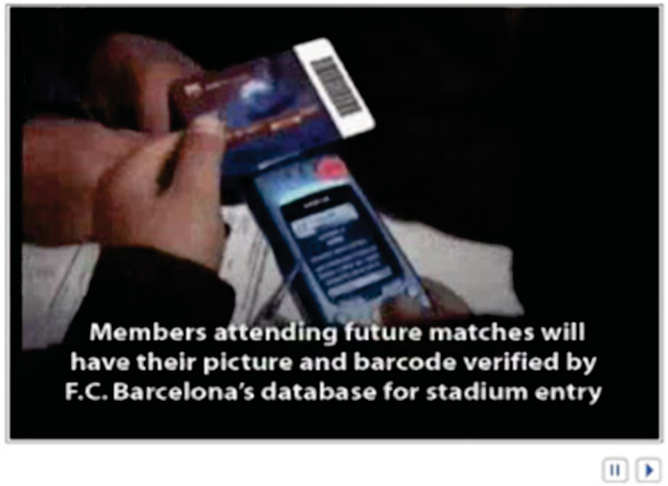
Claims	Prior Art
	ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

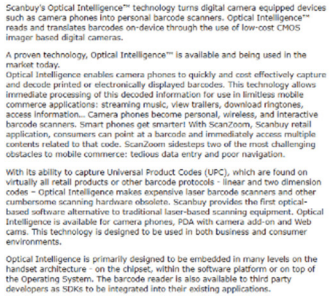
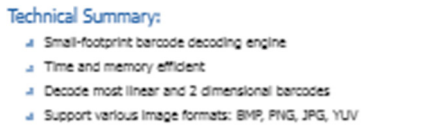
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

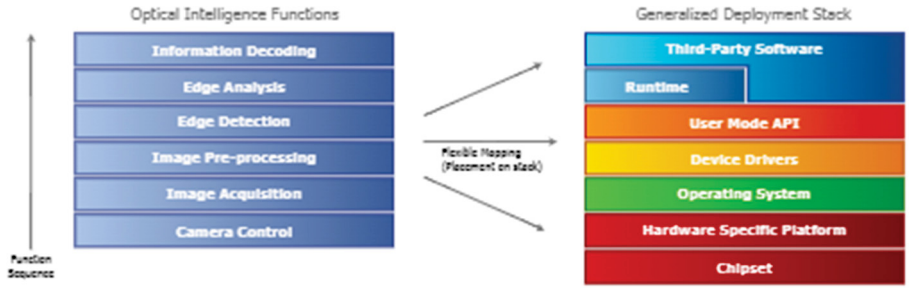
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

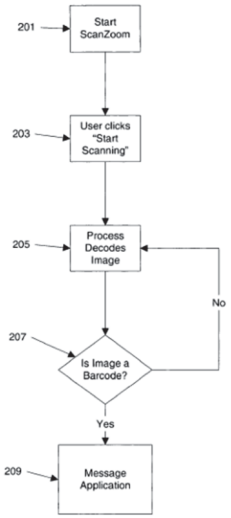
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE** 

Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. ScanZoom (Trifold) at 1  Technical Summary: ▪ Small-footprint barcode decoding engine ▪ Time and memory efficient ▪ Decode most linear and 2 dimensional barcodes ▪ Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2  Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms.

Claims	Prior Art
	ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2 Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: - Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. - Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. - Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. - Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* claim 3. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
5. The system of claim 3, wherein the plurality of monitoring criteria Includes criteria based on light brightness, skewing, and warping.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 3, wherein the plurality of monitoring criteria Includes criteria based on light brightness, skewing, and warping." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device.

Claims	Prior Art
	Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1

Claims	Prior Art
	ScanZoom (Attia) at FIG. 2A  FIG. 2A ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants ("PDAs"), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as "ScanZoom") designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for

Claims	Prior Art
	decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera

Claims	Prior Art
	connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be

Claims	Prior Art
	redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of

Claims	Prior Art
	mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for “on-the-fly” decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated.

Claims	Prior Art
	ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark).

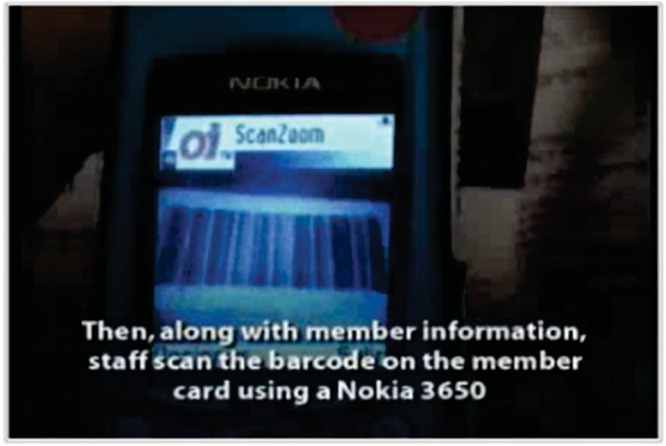
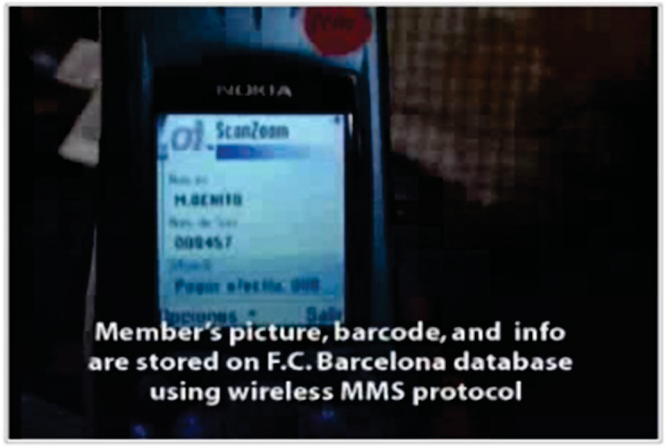
Claims	Prior Art
	ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461.

Claims	Prior Art
	ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by

Claims	Prior Art
	ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

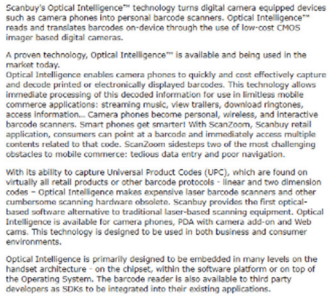
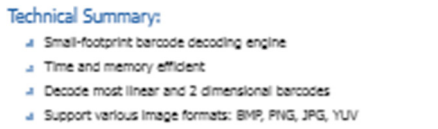
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

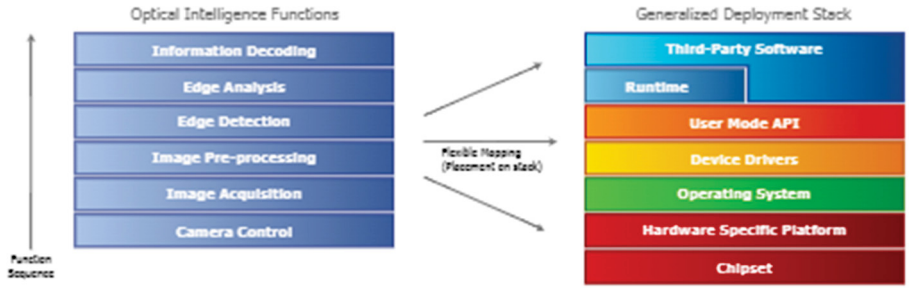
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE** 

Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. ScanZoom (Trifold) at 1  Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2  Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms.

Claims	Prior Art
	ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2 Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: - Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. - Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. - Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. - Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* claim 3. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
6. The system of claim 1, wherein the confirming that the mobile check deposit can go forward is performed after the transmitting	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 1, wherein the confirming that the mobile check deposit can go forward is performed after the transmitting the digital image of the check from the user's mobile device." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device.

Claims	Prior Art
the digital image of the check from the user's mobile device.	Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately

Claims	Prior Art
	and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as "ScanZoom") designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 3:53–67 If ScanZoom sends a MMS message to the server, it launches the MMS Application Id, composes the appropriate message on the fly, and then sends the message to the SMS/MMS server. On the server side, a global system for mobile communications ("GSM") modem connected to the server has the appropriate security identity module ("SIM") card and takes the services from any mobile service provider. The server fetches the MMS message from the GSM modem queue and performs appropriate action depending upon the message. The server can then send back a simple SMS message or can send back a multimedia

Claims	Prior Art
	message service ("MMS") message which can launch a WAP browser on the mobile device and direct it to the appropriate website, or send back information to the user through any other existing wireless protocol. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless

Claims	Prior Art
	network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a “preview” window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode

Claims	Prior Art
	utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the

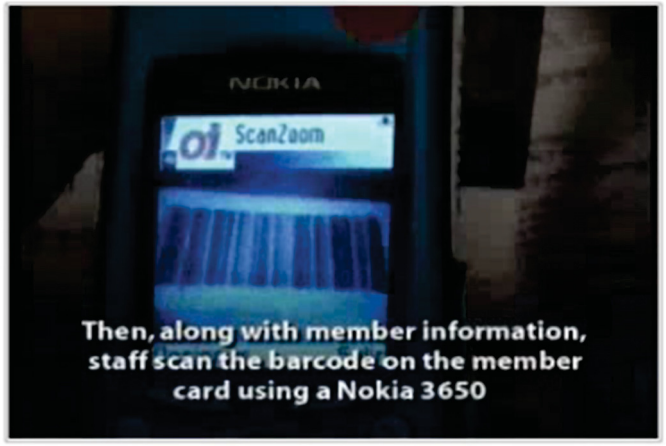
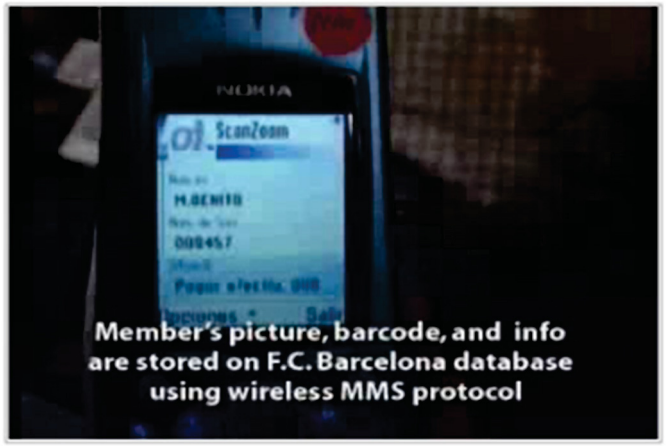
Claims	Prior Art
	camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361.

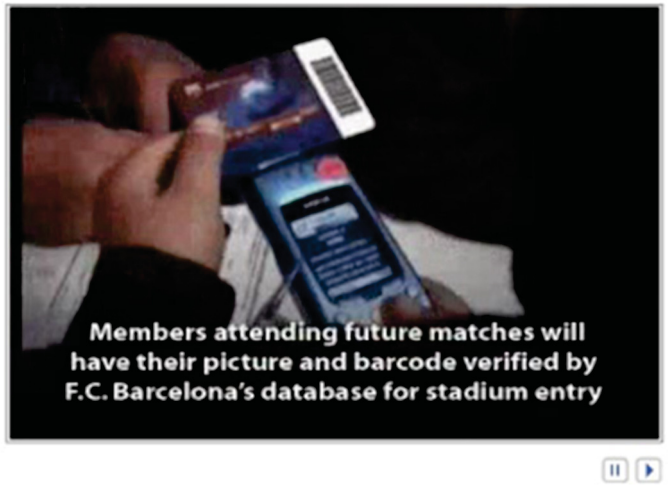
Claims	Prior Art
	ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by

Claims	Prior Art
	ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

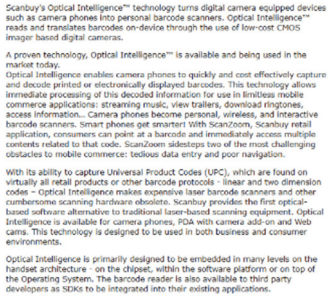
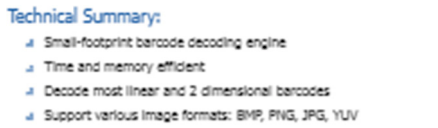
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

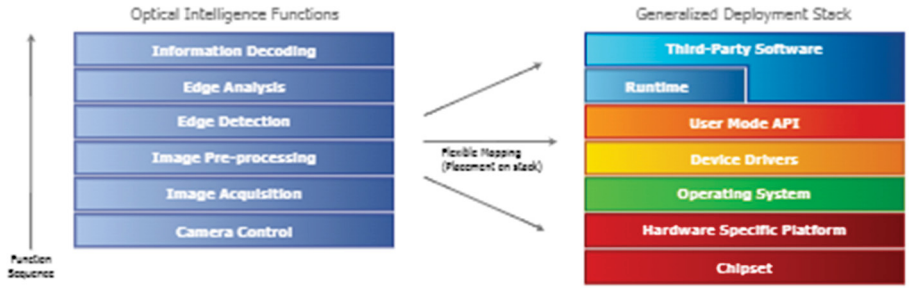
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

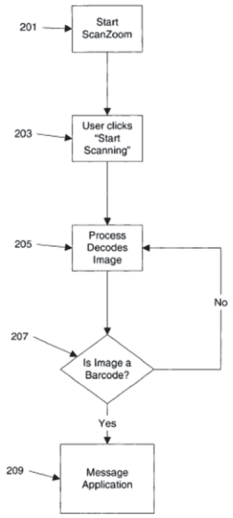
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

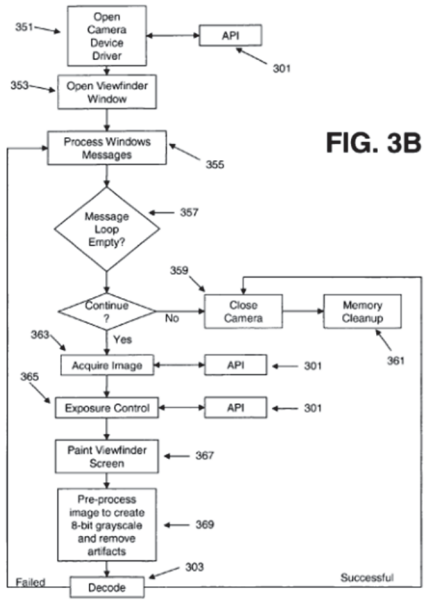
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE** 

Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. ScanZoom (Trifold) at 1  Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2  Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms.

Claims	Prior Art
	ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

Claims	Prior Art
	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2 Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: - Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. - Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. - Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. - Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[i], 1[k]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
7. The system of claim 1, wherein the digital image is a modified version of the captured video frame.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 1, wherein the digital image is a modified version of the captured video frame." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the

Claims	Prior Art
	barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at FIG. 2A  FIG. 2A

Claims	Prior Art
	ScanZoom (Attia) at FIG. 3B  FIG. 3B ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants (“PDAs”), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom

Claims	Prior Art
	application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images

Claims	Prior Art
	is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209.

Claims	Prior Art
	ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the

Claims	Prior Art
	camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for “on-the-fly” decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 8:55–64 In ordinary application usage, decoding engine 303 does not require special illumination sources due to its ability to decode barcodes from images with low contrast. For color imagers, decoding engine 303 utilizes

Claims	Prior Art
	specific image processing algorithms in order to avoid problematic image artifacts during the translation from color to grayscale. Decoding engine 303 utilizes fast image processing algorithms to perform the conversion so that the maximum amount of information is preserved, making for a robust, easy to use reader. ScanZoom (Attia) at 10:11–13 Finally, camera control module 305 operates in conjunction with API 301 to enable a user to take a photograph of barcode 103 with digital camera 107. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311,

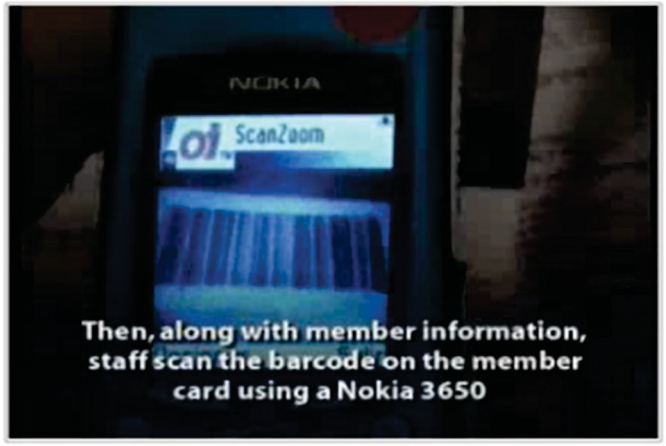
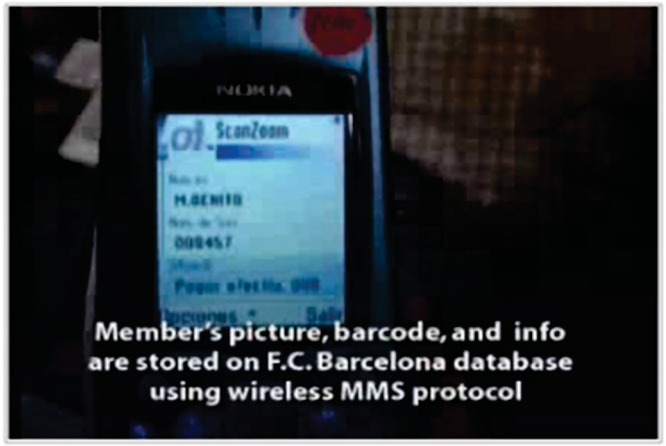
Claims	Prior Art
	PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459 and the stop character of the barcode in step 461. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1  New Technology Enables Camera Phones To Scan Bar Codes

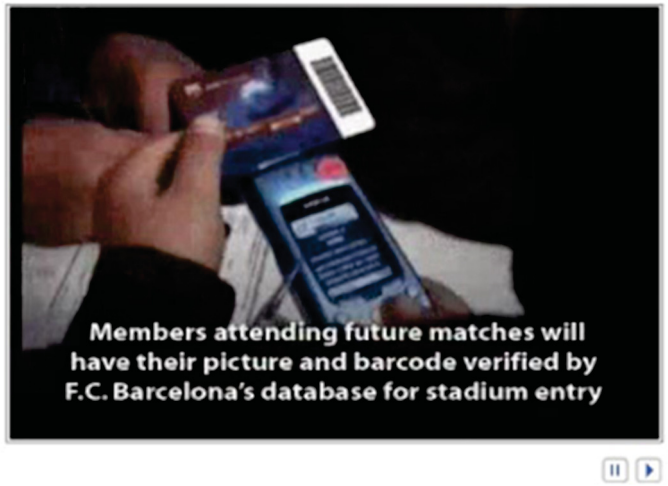
Claims	Prior Art
	ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 3 This type of enterprise-oriented application is what software and services firm AirClic believes is the key market for the camera phone/bar code combination. The company already has a relationship with Nextel Communications in which it provides application software for subscribers that use Symbol Technologies ' MSN2oi bar code scanning attachment for Motorola iDEN phones. Although this application doesn't involve camera phones, Nextel subscribers can use the company's Direct Connect feature to initiate a bar code scan. According to Peter Ritz , AirClic president and co-founder, the company envisions being able to provide similar services for customers who use their camera phones to scan bar codes. Unlike Scanbuy, AirClic sees much more potential from the enterprise side of the business than consumer, at least initially. "We are more focused on the enterprise side," Ritz says. "We believe it is an interesting market."

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

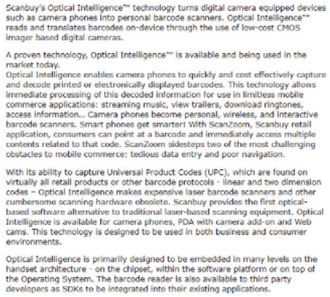
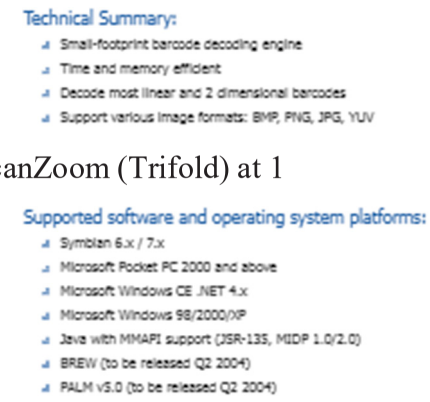
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

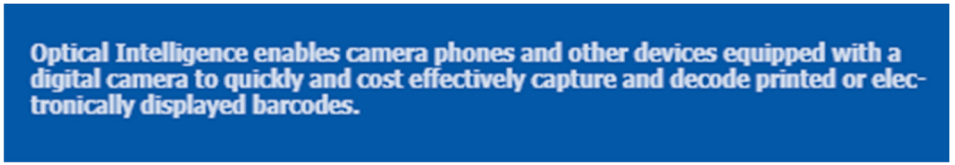
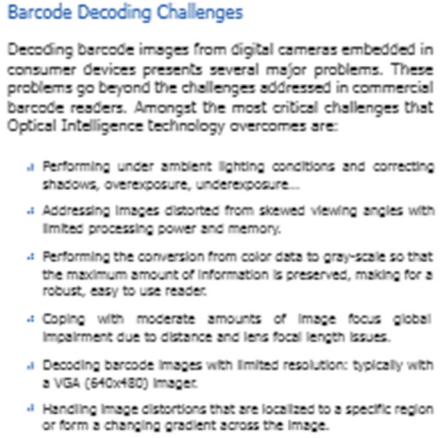
Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

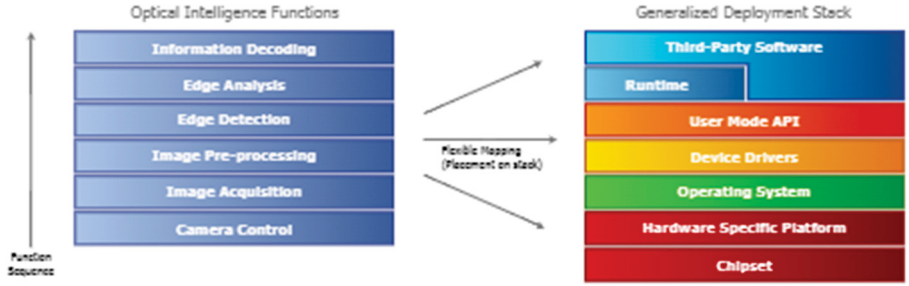
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

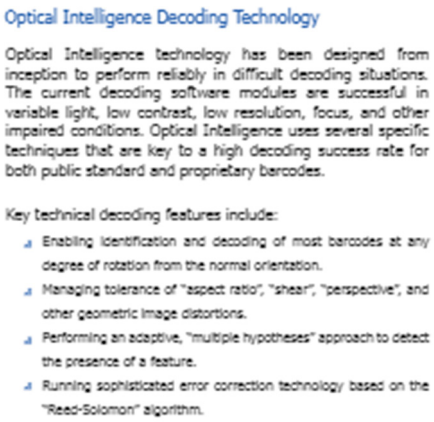
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

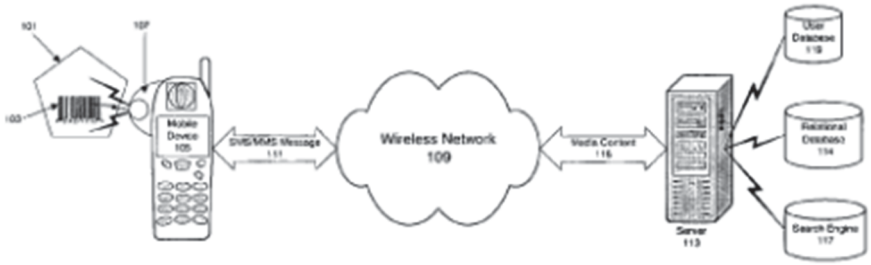
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE**  ScanZoom (Optical Intelligence) at 2 **OPERATING SYSTEMS SUPPORTED:** • Symbian 6.x/7.x • Microsoft Pocket PC with Windows CE .NET 4.x • JSR-135 MIDP support for Java version of application

Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. ScanZoom (Trifold) at 1  Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 1 Supported software and operating system platforms: - Symbian 6.x / 7.x - Microsoft Pocket PC 2000 and above - Microsoft Windows CE .NET 4.x - Microsoft Windows 98/2000/XP - Java with MMAPI support (JSR-135, MIDP 1.0/2.0) - BREW (to be released Q2 2004) - PALM v5.0 (to be released Q2 2004)

Claims	Prior Art
	ScanZoom (Trifold) at 2  Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2  Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes. ScanZoom (Trifold) at 2  Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image.

Claims	Prior Art
	ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack. ScanZoom (Trifold) at 2 

Claims	Prior Art
	ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitations 1[j], 1[m], 1[o]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
8. The system of claim 1, wherein the wireless network is a cellular network.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 1, wherein the wireless network is a cellular network." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device.

Claims	Prior Art
	ScanZoom (Attia) at FIG. 1  FIG. 1 ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants ("PDAs"), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist. ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial

Claims	Prior Art
	products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the

Claims	Prior Art
	cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol ("WAP"), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom. Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 3:53–67 If ScanZoom sends a MMS message to the server, it launches the MMS Application Id, composes the appropriate message on the fly, and then sends the message to the SMS/MMS server. On the server side, a global system for mobile communications ("GSM") modem connected to the server has the appropriate security identity module ("SIM") card and takes the services from any mobile service provider. The server fetches the MMS message from the GSM modem queue and performs appropriate action depending upon the message. The server can then send back a simple SMS message or can send back a multimedia message service ("MMS") message which can launch a WAP browser on the mobile device and direct it to the appropriate website, or send back information to the user through any other existing wireless protocol. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera

Claims	Prior Art
	connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be

Claims	Prior Art
	redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209. ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of

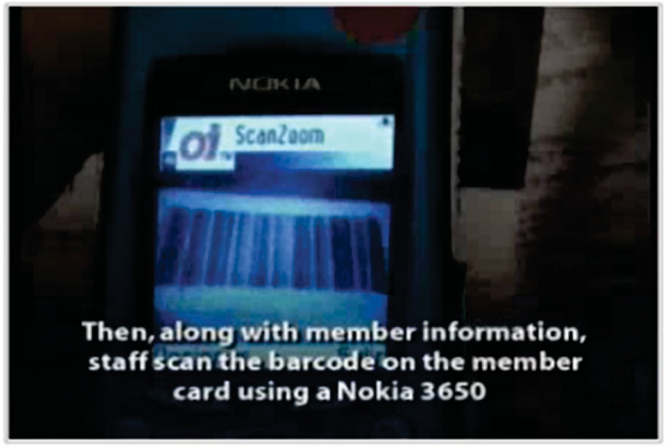
Claims	Prior Art
	mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface ("API") 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a "viewfinder" window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for "on-the-fly" decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated.

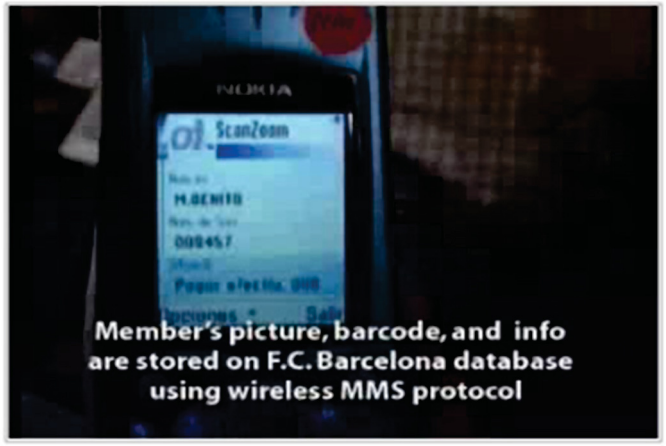
Claims	Prior Art
	ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Brochure) at 1  Various Possible Applications ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes

Claims	Prior Art
	ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products. ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games.

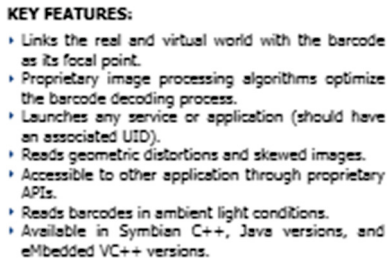
Claims	Prior Art
	ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says. ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process.

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:01–0:00:05  ScanZoom (Interview Video) at 0:00:07–0:00:11 

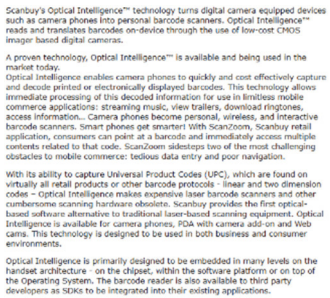
Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55  ScanZoom (Interview Video) at 0:00:55–0:01:25 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:25–0:01:33  ScanZoom (Interview Video) at 0:01:33–0:01:46 

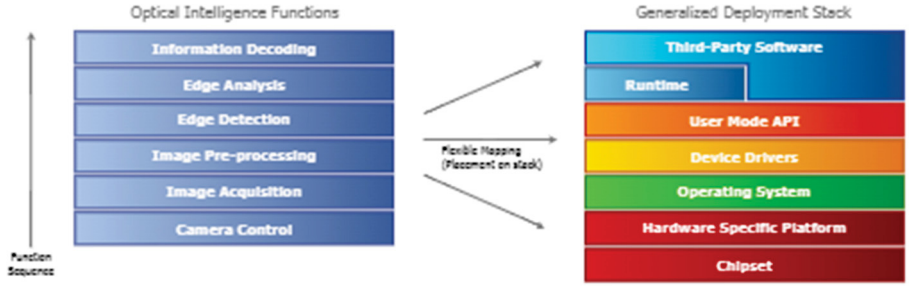
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched.

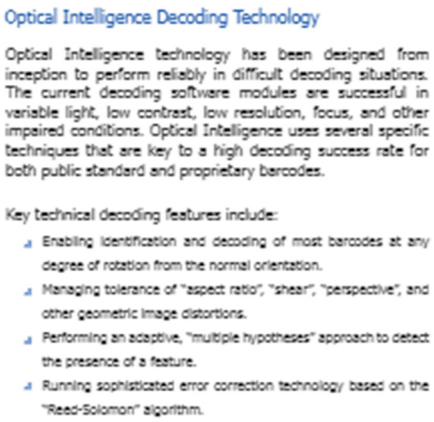
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1  **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned. ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices**

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application**: On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application**: You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services**: You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application**: If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing**: You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order. ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2  ScanZoom (Optical Intelligence Summary) at 1  Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes – Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1  What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.

Claims	Prior Art
	ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms. ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image.

Claims	Prior Art
	ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack. ScanZoom (Trifold) at 2 

Claims	Prior Art
	ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See also* limitation 1[j]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
9[pre]. A system enabling mobile check deposit auto-capture functionality via video frame processing, the system comprising:	To the extent the preamble is limiting, ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[a] system enabling mobile check deposit auto-capture functionality via video frame processing, the system." For example: *See* limitation 1[pre]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9a] a mobile device of a user, the user's mobile device including a camera, a processor, and a memory coupled to the processor, the memory storing a downloaded app, the downloaded app associated with a bank to control check	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a mobile device of a user, the user's mobile device including a camera, a processor, and a memory coupled to the processor, the memory storing a downloaded app, the downloaded app associated with a bank to control check deposit by controlling the camera, the system being configured to perform operations including." For example: *See* limitations 1[a], 1[c].

Claims	Prior Art
deposit by controlling the camera, the system being configured to perform operations including:	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9b] providing Instructions to the user for capturing an image of a check;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "providing Instructions to the user for capturing an image of a check." For example: *See* limitation 1[d]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9c] generating a live video of the check in a field of view of the camera, the downloaded app causing the live video to be generated by controlling the camera;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "generating a live video of the check in a field of view of the camera, the downloaded app causing the live video to be generated by controlling the camera." For example: *See* limitation 1[e]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9d] overlaying an alignment guide on the live video of the check in the field of view of the camera;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "overlaying an alignment guide on the live video of the check in the field of view of the camera." For example: *See* limitation 1[f]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9e] monitoring the live video of the check in the field of view of the camera with respect to at least one monitoring criterion;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "monitoring the live video of the check in the field of view of the camera with respect to at least one monitoring criterion." For example: *See* limitation 1[g].

Claims	Prior Art
	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9f] determining that a video frame of the live video of the check satisfies the at least one monitoring criterion and then automatically capturing the video frame;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "determining that a video frame of the live video of the check satisfies the at least one monitoring criterion and then automatically capturing the video frame." For example: *See* limitation 1[h]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9g] when the video frame of the live video of the check in the field of view of the camera is determined to satisfy the at least one monitoring criterion, providing feedback advising the user that the check has been captured;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "when the video frame of the live video of the check in the field of view of the camera is determined to satisfy the at least one monitoring criterion, providing feedback advising the user that the check has been captured." For example: *See* limitation 1[i]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9h] using a wireless network, transmitting a digital image of the check from the user's mobile device and submitting the check for mobile check deposit in the bank after automatically capturing the video frame, the digital image of the check being the captured video frame or being based on the captured video frame;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "using a wireless network, transmitting a digital image of the check from the user's mobile device and submitting the check for mobile check deposit in the bank after automatically capturing the video frame, the digital image of the check being the captured video frame or being based on the captured video frame." For example: *See* limitation 1[j]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.

Claims	Prior Art
[9i] processing the digital image of the check Including performing optical character recognition and verifying that the digital image of the check Is acceptable for mobile check deposit; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "processing the digital image of the check Including performing optical character recognition and verifying that the digital image of the check Is acceptable for mobile check deposit." For example: *See* limitation 1[l], 1[n]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9j] confirming that the mobile check deposit can go forward after optical character recognition is performed on the check in the digital image, a magnetic ink character recognition (MICR) line on the check in the digital image is recognized, and an amount payable on the check in the digital image is validated; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "confirming that the mobile check deposit can go forward after optical character recognition is performed on the check in the digital image, a magnetic ink character recognition (MICR) line on the check in the digital image is recognized, and an amount payable on the check in the digital image is validated." For example: *See* limitation 1[k]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[9k] a bank computer programmed to update a balance of an account at a financial institution of the user to reflect an amount of funds associated with the check submitted for mobile check deposit by the user's mobile device, after the check is submitted for mobile check deposit in the bank, confirming that the mobile check deposit can go forward, and verifying that the digital image of the check is acceptable for mobile check deposit.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a bank computer programmed to update a balance of an account at a financial institution of the user to reflect an amount of funds associated with the check submitted for mobile check deposit by the user's mobile device, after the check is submitted for mobile check deposit in the bank, confirming that the mobile check deposit can go forward, and verifying that the digital image of the check is acceptable for mobile check deposit." For example: *See* limitation 1[o]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.

Claims	Prior Art
10[pre]. The system of claim 9, wherein the system is configured to perform additional operations including:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 9, wherein the system is configured to perform additional operations including." For example: *See* limitation 2[pre]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[10a] before determining that the video frame of the live video of the check satisfies the at least one monitoring criterion, determining that a different video frame of the live video of the check does not satisfy the at least one monitoring criterion; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "before determining that the video frame of the live video of the check satisfies the at least one monitoring criterion, determining that a different video frame of the live video of the check does not satisfy the at least one monitoring criterion." For example: *See* limitation 2[a]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[10b] after determining that the different video frame of the live video of the check does not satisfy the at least one monitoring criterion, providing feedback to the user.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "after determining that the different video frame of the live video of the check does not satisfy the at least one monitoring criterion, providing feedback to the user." For example: *See* limitation 2[b]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
11. The system of claim 9, further comprising one or more computers programmed to perform operations comprising the monitoring, the determining, or both the monitoring and the determining.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 9, further comprising one or more computers programmed to perform operations comprising the monitoring, the determining, or both the monitoring and the determining." For example: *See* limitations 9[a], 9[e], 9[f].

Claims	Prior Art
	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
12. The system of claim 9, wherein the at least one monitoring criterion is a plurality of monitoring criteria based on two or more selected from a group consisting of light contrast, light brightness, check positioning, check dimensions, character spacing, skewing, warping, corner detection, edge detection, and magnetic ink character recognition (MICR) line detection.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 9, wherein the at least one monitoring criterion is a plurality of monitoring criteria based on two or more selected from a group consisting of light contrast, light brightness, check positioning, check dimensions, character spacing, skewing, warping, corner detection, edge detection, and magnetic ink character recognition (MICR) line detection." For example: *See* claim 3. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
13. The system of claim 12, wherein the plurality of monitoring criteria Includes criteria based on light brightness, skewing, and warping.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 12, wherein the plurality of monitoring criteria Includes criteria based on light brightness, skewing, and warping." For example: *See* claim 5. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
14. The system of claim 9, wherein the confirming that the mobile check deposit can go forward is performed after the transmitting the digital image of the check from the user's mobile device.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 9, wherein the confirming that the mobile check deposit can go forward is performed after the transmitting the digital image of the check from the user's mobile device." For example: *See* claim 6. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.

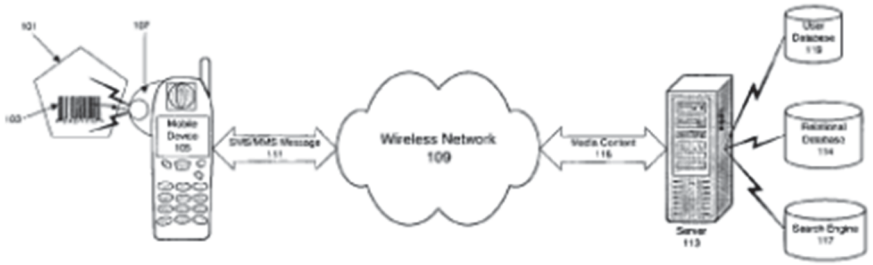
Claims	Prior Art
15. The system of claim 14, wherein the user's mobile device receives an Indication of a result of the processing the digital image of the check before the confirming step.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 14, wherein the user's mobile device receives an Indication of a result of the processing the digital image of the check before the confirming step." For example: *See* limitations 1[n], 9[i], 9[j]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
16. The system of claim 11, wherein the one or more computers include the bank computer.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 11, wherein the one or more computers include the bank computer." For example: *See* limitations 9[a], 9[e], 9f], claim 11. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
17. The system of claim 9, wherein the wireless network is a cellular network.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 9, wherein the wireless network is a cellular network." For example: *See* limitation 9[h]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
18[pre]. A system enabling mobile check deposit auto-capture functionality via video frame processing, the system comprising:	To the extent the preamble is limiting, ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[a] system enabling mobile check deposit auto-capture functionality via video frame processing, the system." For example: *See* limitation 1[pre]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.

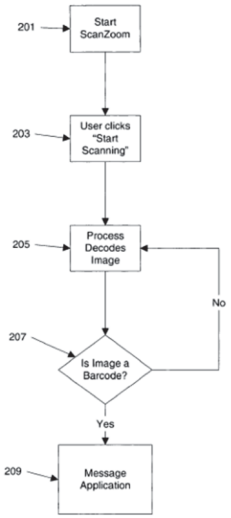
Claims	Prior Art
[18a] a mobile device of a user, the user's mobile device including a camera, a processor, and a memory coupled to the processor, the memory storing:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a mobile device of a user, the user's mobile device including a camera, a processor, and a memory coupled to the processor, the memory storing." For example: *See* limitation 1[a]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18b] a software abstraction layer, the software abstraction layer comprising Instructions that, when executed by the processor, control the camera; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a software abstraction layer, the software abstraction layer comprising Instructions that, when executed by the processor, control the camera." For example: *See* limitation 1[b]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18c] a downloaded app, the downloaded app associated with a bank to control check deposit by controlling the camera through the software abstraction layer, the downloaded app comprising Instructions that, when executed by the processor, cause the user's mobile device to perform operations including:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a downloaded app, the downloaded app associated with a bank to control check deposit by controlling the camera through the software abstraction layer, the downloaded app comprising Instructions that, when executed by the processor, cause the user's mobile device to perform operations including." For example: *See* limitation 1[c]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18d] providing Instructions to the user for capturing an image of a check;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "providing Instructions to the user for capturing an image of a check." For example: *See* limitation 1[d].

Claims	Prior Art
	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18e] generating a live video of the check in a field of view of the camera, the downloaded app causing the live video to be generated by controlling the camera through the software abstraction layer;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "generating a live video of the check in a field of view of the camera, the downloaded app causing the live video to be generated by controlling the camera through the software abstraction layer." For example: *See* limitation 1[e]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18f] monitoring the live video of the check in the field of view of the camera with respect to at least one monitoring criterion;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "monitoring the live video of the check in the field of view of the camera with respect to at least one monitoring criterion." For example: *See* limitation 1[g]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18g] determining that a video frame of the live video of the check satisfies the at least one monitoring criterion and then automatically capturing the video frame;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "determining that a video frame of the live video of the check satisfies the at least one monitoring criterion and then automatically capturing the video frame." For example: *See* limitation 1[h]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18h] when the video frame of the live video of the check in the field of view of the camera is determined to satisfy the at least	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "when the video frame of the live video of the check in the field of view of the camera is determined to satisfy the at least one monitoring criterion, providing feedback advising the user that the check has been captured." For example:

Claims	Prior Art
one monitoring criterion, providing feedback advising the user that the check has been captured;	*See* limitation 1[i]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18i] using a wireless network, transmitting a digital image of the check from the user's mobile device and submitting the check for mobile check deposit in the bank after automatically capturing the video frame, wherein the digital image is the captured video frame or is based on the captured video frame; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "using a wireless network, transmitting a digital image of the check from the user's mobile device and submitting the check for mobile check deposit in the bank after automatically capturing the video frame, wherein the digital image is the captured video frame or is based on the captured video frame." For example: *See* limitation 1[j]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18j] confirming that the mobile check deposit can go forward after optical character recognition is performed on the check, a magnetic ink character recognition (MICR) line on the check is recognized, and an amount payable on the check is validated; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "confirming that the mobile check deposit can go forward after optical character recognition is performed on the check, a magnetic ink character recognition (MICR) line on the check is recognized, and an amount payable on the check is validated." For example: *See* limitation 1[k]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[18k] a computer comprising a processor coupled to a memory storing Instructions that, when executed by the processor, cause the computer to update a balance of an account at a financial institution of the user to reflect an amount of funds associated with the check submitted for mobile	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a computer comprising a processor coupled to a memory storing Instructions that, when executed by the processor, cause the computer to update a balance of an account at a financial institution of the user to reflect an amount of funds associated with the check submitted for mobile check deposit by the user's mobile device, after the submitting the check for mobile check deposit and the confirming that the mobile check deposit can go forward." For example: *See* limitation 1[o].

Claims	Prior Art
check deposit by the user's mobile device, after the submitting the check for mobile check deposit and the confirming that the mobile check deposit can go forward.	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
19[pre]. The system of claim 18, wherein the downloaded app causes the user's mobile device to perform additional operations including:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 18, wherein the downloaded app causes the user's mobile device to perform additional operations including." For example: *See* limitation 2[pre]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[19a] before determining that the video frame of the live video of the check satisfies the at least one monitoring criterion, determining that a different video frame of the live video of the check does not satisfy the at least one monitoring criterion; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "before determining that the video frame of the live video of the check satisfies the at least one monitoring criterion, determining that a different video frame of the live video of the check does not satisfy the at least one monitoring criterion." For example: *See* limitation 2[a]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[19b] after determining that the different video frame of the live video of the check does not satisfy the at least one monitoring criterion, providing feedback to the user.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "after determining that the different video frame of the live video of the check does not satisfy the at least one monitoring criterion, providing feedback to the user." For example: *See* limitation 2[b]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
20. The system of claim 18, wherein the at least one monitoring	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 18, wherein the at least one monitoring criterion is a plurality of monitoring criteria based on

Claims	Prior Art
criterion is a plurality of monitoring criteria based on two or more selected from a group consisting of light contrast, light brightness, check positioning, check dimensions, character spacing, skewing, warping, corner detection, edge detection, and magnetic ink character recognition (MICR) line detection.	two or more selected from a group consisting of light contrast, light brightness, check positioning, check dimensions, character spacing, skewing, warping, corner detection, edge detection, and magnetic ink character recognition (MICR) line detection." For example: *See* claim 3. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
21. The system of claim 20, wherein the plurality of monitoring criteria being based on magnetic ink character recognition (MICR) line detection and one or both of corner detection and edge detection.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 20, wherein the plurality of monitoring criteria being based on magnetic ink character recognition (MICR) line detection and one or both of corner detection and edge detection." For example: ScanZoom (Attia) at Abstract The present invention discloses a system and method for decoding barcodes using mobile device. Generally, the barcode image is acquired via a digital camera attached to the mobile device. After the barcode image has been acquired, software located on the mobile device enhances the barcode image and subsequently decodes the barcode information. The barcode information is then transmitted to a server via a wireless network. The server processes the barcode information and transmits media content related to the barcode back to the mobile device. ScanZoom (Attia) at FIG. 1  FIG. 1

Claims	Prior Art
	ScanZoom (Attia) at FIG. 2A  FIG. 2A ScanZoom (Attia) at 1:20–43 Barcodes have been utilized for identifying and pricing objects for more than thirty years. Most typically, barcodes are used in retail to identify the item of merchandise. For example, a gallon of milk may contain a barcode that, when scanned, will notify the cashier of the price of the milk. Yet in recent years, barcodes have acquired new purposes as computers and barcode scanners have become more portable. The circuitry required to scan a conventional one-dimensional barcode can now be housed in a device as small as a typical keychain. As a result, many mobile telephones, personal digital assistants ("PDAs"), and pagers can be retrofitted with or connected to a laser-based scanning device. This allows the mobile device to function as a scanner capable of storing hundreds or thousands of scanned barcodes. Mobile devices with attached scanners have allowed for the development of a new niche in the wireless electronics business. Some companies have developed software and hardware which allows a user to scan any barcode and be redirected to media information (e.g., a website, product description, price, etc.) about the scanned product. These programs provide a link between the physical and online world which previously did not exist.

Claims	Prior Art
	ScanZoom (Attia) at 1:53–67 Currently, many cell phones and mobile devices are available with built-in cameras. The explosion of the availability of affordable digital cameras and their inclusion into mobile devices is driven by several factors. One of the most important is the recent availability of inexpensive image sensors based on CMOS technology. The cameras on these devices provide a means for capturing the barcode information which was previously only accessible via a laser-based scanner. Decoding barcode images from digital cameras included in mobile devices presents several difficult problems. These problems go well beyond the challenges addressed in commercial barcode readers. Barcode decoding algorithms from commercial products will not consistently decode images from a consumer portable device. Some of these problems are addressed below: ScanZoom (Attia) at 2:1–10 Lighting: Most mobile devices with integrated digital cameras do not have built-in flashes and rely solely on the ambient light for illumination. Using highly variable ambient light makes pattern recognition much more difficult. Shadows, shading across the length of a barcode, overexposure, underexposure, and similar problems that are typical of any camera not utilizing a flash can foil traditional barcode decoding algorithms that are designed for highly controlled lighting environments. ScanZoom (Attia) at 2:12–16 Size: The distance between a digital camera and its target object is not usually rigidly controlled. This translates into a large range of possible sizes (magnifications) that a barcode can have on a fixed size image sensor. ScanZoom (Attia) at 2:18–31 Skew: As any photographer knows, taking pictures at an angle changes the apparent shape of the object to a viewer. A barcode with a rectangular shape, when viewed straight-on, can look like a trapezoid (or irregular quadrilateral) when viewed from an angle. The location and addressing of image pixels for a barcode change dramatically when viewed from the side, or tilted. Algorithms to decode barcodes from digital images must be able to address images distorted from skewed viewing angles, but must do so within the constraints of limited hardware, processing power, and memory typically found in mobile devices such as PDAs and handsets.

Claims	Prior Art
	ScanZoom (Attia) at 2:42–51 Consumer oriented devices such as mobile handsets generally are designed with color image sensors. However, barcode scanning typically operates best with gray-scale information. Color data typically requires three times the amount of storage and handling required by gray-scale. Data needs to be transferred through the camera's CPU and memory to be processed. For color imagers, specific image processing algorithms are required in order to avoid problematic image artifacts during the translation from color to grayscale. ScanZoom (Attia) at 2:54–59 Digital cameras for portable devices are usually designed to work at a variety of distances. The need for a wider range of focus in cameras results in a trade off between the cost of the lens component and the sharpness of a typical image. Decoding algorithms for embedded digital cameras must be able to cope with a moderate degree of focus problems. ScanZoom (Attia) at 3:14–20 Based on the aforementioned described problems with mobile digital imaging, there clearly exists a need for a system capable of capturing, decoding, and analyzing barcode information obtained from a digital camera enabled mobile device. Such a system would enable the average mobile device user to accurately and reliably scan and decode any barcode available. ScanZoom (Attia) at 3:24–33 The present invention provides a software application and system (hereinafter referred to as “ScanZoom”) designed to successfully process and decode barcodes acquired via digital imaging techniques. ScanZoom software empowers a user to use a cell-phone or PDA equipped with a digital camera as a scanner of barcodes (one-dimensional and two-dimensional) or any other similar machine-readable code. It seamlessly integrates the barcode scanning technology with the digital camera (built-in or attached) of the cell phones/PDAs/Pocket PCs. ScanZoom (Attia) at 3:34–43 To utilize the ScanZoom software, a user downloads the ScanZoom onto his/her cell phone or PDA through wireless access protocol (“WAP”), infrared, or Bluetooth® connectivity. However, any protocol which allows a user to download a program to a mobile device may be utilized to download ScanZoom.

Claims	Prior Art
	Once the user has downloaded ScanZoom, the user launches the application. This causes ScanZoom to properly initialize the digital camera coupled to the mobile device to accept input. It starts the digital camera by calling its Application identification. ScanZoom (Attia) at 3:45–52 The user then takes a picture of the barcode using the digital camera. As soon as the barcode is captured, the ScanZoom software decodes the barcode utilizing a decoding engine integral to the ScanZoom software. Alternatively, the Scanzoom software may send the image of the barcode to a central server for decoding by sending a multimedia message service ("MMS") message to the server containing the barcode image. ScanZoom (Attia) at 4:1–7 The location of the decoding depends entirely upon the processing capabilities of the mobile device utilized. For example, if the ScanZoom software is operating on a mobile device with lower system capabilities, such as a first generation camera phone, the mobile device will automatically send the digital image of the barcode to a server for decoding. ScanZoom (Attia) at 4:8–12 The barcode decoding engine continuously runs in a loop until it's able to decode the image taken by the digital camera into a barcode. If the barcode cannot be properly resolved, the user is prompted to take another picture of the desired barcode. ScanZoom (Attia) at 4:13–18 Additionally, the barcode decoding may also be performed in real time. The ScanZoom software accomplishes this by constantly capturing and processing the image of the barcode until it is correctly decoded. This eliminates the extra step of the user having to press a button to capture an image of the barcode. ScanZoom (Attia) at 4:19–29 After the barcode has been correctly resolved either by the mobile device or the server, the mobile device displays the appropriate media content to the user. The media content displayed to the user depends entirely on the barcode scanned. For example, if a user scans a barcode on a compact disc, the ScanZoom

Claims	Prior Art
	application may launch a WAP browser and direct the user to a site which allows the user to purchase the compact disc electronically. As another example, if a user scans a barcode located on a food item, the server may return a SMS message to the mobile device indicating the nutritional contents of the scanned item. ScanZoom (Attia) at 4:30–34 Therefore, it is an object of the present invention to provide a software application and system capable of accurately and reliably decoding barcodes and other machine-readable codes acquired via a digital camera connected to a mobile device. ScanZoom (Attia) at 5:58–67 To scan barcode 103, a user utilizes mobile device 105 with attached or embedded digital camera 107. The user first launches the ScanZoom application on mobile device 105. If the ScanZoom software has not yet been loaded onto mobile device 105, a user may do so by downloading the program via WAP, Bluetooth, or infrared connectivity. Mobile device 105 may be any device capable of digitally imaging barcode 103 such as a camera phone, mobile phone with camera attachment, PDA, PDA with camera attachment, Pocket PC, Palm device, laptop, desktop, etc. ScanZoom (Attia) at 6:1–13 Once an image of barcode 103 has been acquired by mobile device 105, the ScanZoom software loaded on mobile device 105 decodes the barcode directly utilizing mobile device 105's internal circuitry. The ScanZoom software can be ported to most any mobile device operating system including, but not limited to, Symbian OS, Palm OS, Windows CE, Windows Mobile, and SmartPhone. The decoded barcode information is then sent to wireless network 109 via SMS/MMS message 111. Wireless network 109 routes SMS/MMS message 111 to the appropriate server 113. Server 113 then processes the received barcode information and relays the appropriate media content 115 to mobile device 105 via wireless network 109. ScanZoom (Attia) at 6:19–27 Yet in another embodiment, mobile device may scan barcode 103 in real time, thereby eliminating the step of capturing a photo of the barcode. In this embodiment, the ScanZoom software located on mobile device 105 constantly acquires images of barcode 103 and stores them in memory. Each of these images

Claims	Prior Art
	is subsequently processed until the barcode is correctly decoded. Once barcode 103 has been decoded, mobile device 105 stops acquiring images of barcode 103. ScanZoom (Attia) at 6:28–35 Server 113 may process SMS/MMS message 111 in many different ways. In a first embodiment, server 113 may use relational database 114 to pull up product information pertaining to product 101. The server would then forward the product information to mobile device 105 via a SMS/MMS message. If a MMS message is sent to mobile device 105, this may cause a WAP browser loaded on mobile device 105 to be redirected to the appropriate site. ScanZoom (Attia) at 6:36–44 In a second embodiment, server 113 may process SMS/MMS message 111 by using relational database 114 to pull up product information related to product 101 and then utilize search engine 117 to search for similar products or information pertaining to it. The results of the search would then be sent to mobile device 105 via a SMS/MMS message. As should be evident from these two described embodiments, the barcode information can be utilized in an almost limitless amount of ways. ScanZoom (Attia) at 6:51–7:6 Referring next to FIG. 2A, shown is the process utilized by ScanZoom to acquire and decode barcode 103 once the application has been launched. A user first launches the ScanZoom program on mobile device 105 by selecting its icon from a list of programs located on the device in step 201. Generally, this will initialize the camera and all the network resources needed by ScanZoom for the application to function properly. Once the user has started the program, a message appears directing the user to take a picture of barcode 103 in step 203. ScanZoom provides the user with a "preview" window which functions as a viewfinder, allowing the user to properly center and align the barcode before taking a picture. Once the barcode image has been acquired by digital camera 107, ScanZoom attempts to decode the barcode utilizing its proprietary barcode decoding algorithm in step 205. If the software cannot decode barcode 103 on a first attempt in step 205, the ScanZoom software attempts to decode the image a finite amount of times. The number of decoding attempts can either be fixed or able to be altered by the user. Once barcode 103 has been properly decoded as verified in step 207, mobile device 105 prepares the decoded information for transfer to server 113 to undergo further processing in step 209.

Claims	Prior Art
	ScanZoom (Attia) at 7:8–20 FIG. 2B depicts the process utilized by the ScanZoom software if the decoded barcode information is sent to server 113 via SMS/MMS message 111. In this scenario, mobile device 105 first encodes the decoded barcode information into SMS/MMS message 111 in step 221. SMS/MMS message 111 is then processed by server 113 in step 223. As previously discussed with respect to FIG. 1, server 113 may utilize any combination of relational database 114, search engine 117, or user database 119 to process the barcode information. Once the barcode has been processed in step 223, server 113 sends the resulting media content 115 back to mobile device 105 in step 225. Media content 115 is then displayed on the screen of mobile device 105 in step 227. ScanZoom (Attia) at 7:32–39 Turning next to FIG. 3A, shown is a schematic diagram depicting the product architecture of the ScanZoom software. The ScanZoom software is composed of three main modules: the application program interface (“API”) 301, decoding engine 303, and camera control module 305. API 301 is the interface which the user utilizes to interact with the ScanZoom software. API 301 guides the user through all the steps required to decode and process barcode 103. ScanZoom (Attia) at 7:40–48 The steps utilized to acquire the barcode image and prepare it for decoding are shown in greater detail in FIG. 3B. As shown, API 301 first directs camera control module 305 to initialize the application ID for digital camera 107 in step 351. This sets up digital camera 107 to accept input. Next, API 301 causes a “viewfinder” window to open on mobile device 105's display in step 353. This allows the user to make sure that barcode 103 is in proper focus and amply illuminated. ScanZoom (Attia) at 7:50–61 API 301 next processes the windows messages in step 355. Windows messages are messages from the camera that interrupt the ScanZoom program if certain events have occurred. For example, a windows message may indicate that a new SMS message has been received or there is an incoming telephone call. Once the windows messages have been properly processed, API 301 checks to see if the windows message loop is empty in step 357. If the windows message loop is not empty, camera control module 305 closes digital camera 107s application ID in step 359. All message and pictures are then cleared from the

Claims	Prior Art
	camera's active memory in step 361. ScanZoom (Attia) at 7:62–8:3 However, if the windows message loop is empty, the user is then directed to push a button on mobile device 105 to take an image of barcode 103 in step 363. Alternatively, the image may be acquired automatically by mobile device 105 for “on-the-fly” decoding. Camera control module 305 interacts directly with API 301 to perform this step since the user must physically push a button on mobile device 105 to take the image. Alternatively, this feature may be fully automated. ScanZoom (Attia) at 8:4–10 Once the image of barcode 103 has been acquired and stored in memory, the image undergoes exposure control in step 365 to correctly compensate for the illumination. More specifically, this step correctly adjusts camera features such as the shutter speed. For example, if the ambient light is low, exposure compensation step 365 may compensate for this by increasing the shutter speed. ScanZoom (Attia) at 8:11–20 At this point in the image acquisition process, the acquired image is displayed to the user for review in step 367. If the user chooses to accept the acquired image, camera control module 305 next converts the image to an eight-bit grayscale image in step 369. Camera control module 305 additionally removes artifacts from the image which are typical of digital images. The artifacts are removed using pattern recognition because barcodes have definite shapes and alien features may be easily eliminated using pattern recognition. ScanZoom (Attia) at 8:21–26 The processed image is then passed to decoding engine 303 for decoding. If the decoding is not successful, API 301 returns the user to step 355 so that a new image can be acquired. However, if decoding is successful, API 301 closes the camera in step 359 and clears the camera's memory in step 361. ScanZoom (Attia) at 11:30–47 Now referring back to FIG. 4A, decoding engine 303 applies an edge enhancement filter to the image in step 407. This further removes any image anomalies which may have occurred during imaging or

Claims	Prior Art
	conversion to black and white. Once the edges are enhanced, decoding engine 303 counts the number of edges which occur in the barcode image in step 409. An edge is a point in the image where there is a sudden change in the color values of the image. An edge that defines a transition from white to black (light to dark) is called a rising edge and an edge that defines the transition from black to white (dark to light) is called a falling edge. Since the quality of the image returned by the camera of the cell phone isn't of a very good quality, the edge detection process relies on the series of approximations and sub processes. Thus the edge detection of step 409 returns a collection of edges (i.e., points where it is believed that the value of the color changed from dark to light or light to dark). ScanZoom (Attia) at 11:48–55 If the number of detected edges is less than 25 as checked in step 411, decoding algorithm 303 attempts to adjust the barcode image again using a new set of assumptions in step 413. The image is then reprocessed using an unaltered version of the image stored in a buffer. If more than 25 edges are not detected after a number of iterations, the ScanZoom application informs the user that a barcode could not be located and the application terminates. ScanZoom (Attia) at 11:56–12:3 However, if the number of edges if found to be greater than or equal to 25, decoding engine 303 advances to the flowchart of FIG. 4B. As shown in the flowchart, decoding engine 303 loads a first symbology library in step 451. The symbology library may be UPN-A/E library 307, RSS library 309, OI library 311, PDF417 library 313, QR code library 315, Code 39 library 317, Code 128 library 319, EAN library 321, and JAN library 323 (see FIG. 3A). Decoding engine then compares the number of edges a barcode needs to be in this library to the number of edges detected in the actual scanned barcode in step 453. If the number of edges does not match, decoding engine 303 loads the next symbology library in step 455 and repeats the edge comparison with the new library. Detection engine 303 continues this comparison until a match is found. ScanZoom (Attia) at 12:4–11 When a match is found in step 453, detection engine 303 proceeds to decode the start character of the barcode from the barcode image in step 457. Typically, the first character in a barcode indicates the use of the code. For example, in UPC codes, if the start character is a six, it indicates that it the barcode is a standard UPC code. Detection engine 303 then decodes the middle characters of the barcode in step 459

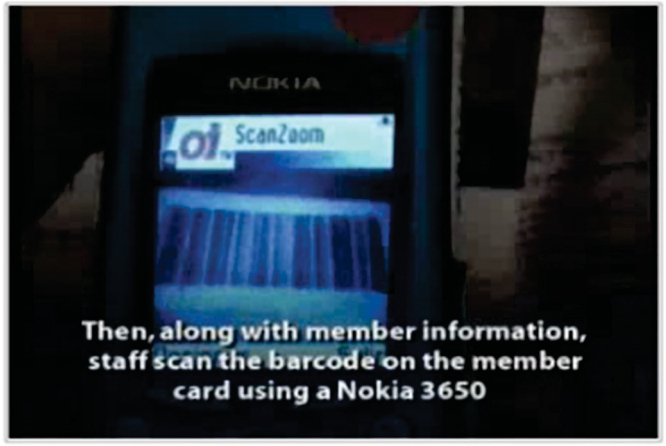
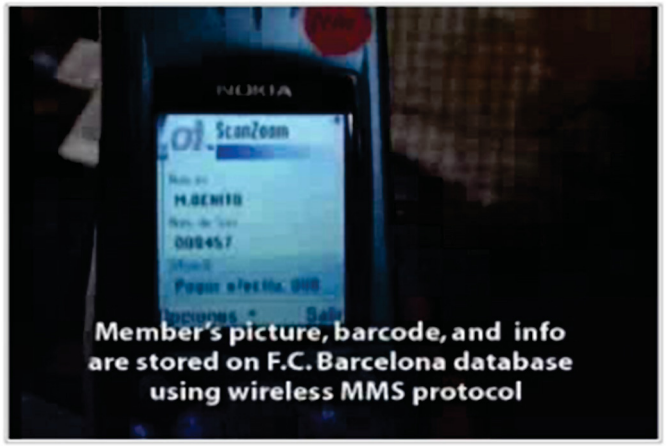
Claims	Prior Art
	and the stop character of the barcode in step 461. ScanZoom (Attia) at 12:12–23 Each barcode font relies on static tables of values to decode each character. These tables are designed using the bit patterns in the barcode font's specification. Each barcode consists of both dark and light elements. The combination of the dark and light elements and their thickness decides the value of the character. The difference of two consecutive edges provides the width of an element. The widths of the elements are then converted into bit patterns and mapped against the static tables to derive the character value. If a good value is returned then the next set of edges is passed. A bad value signifies that the barcode character could not be decoded. ScanZoom (Attia) at 12:24–32 In many barcode formats, the stop character is used as a check digit to ensure that the barcode has been decoded correctly. Detection engine 303 performs such an integrity check in step 463. If the integrity check fails, detection engine either loads another symbology library in step 455 or attempts to re-decode the image in step 457. If the integrity check is passed in step 463, decoding engine 303 is terminated in step 465 and the barcode data is forwarded to the messaging system (see FIG. 2A, step 209). ScanZoom (Brochure) at 1  Various Possible Applications

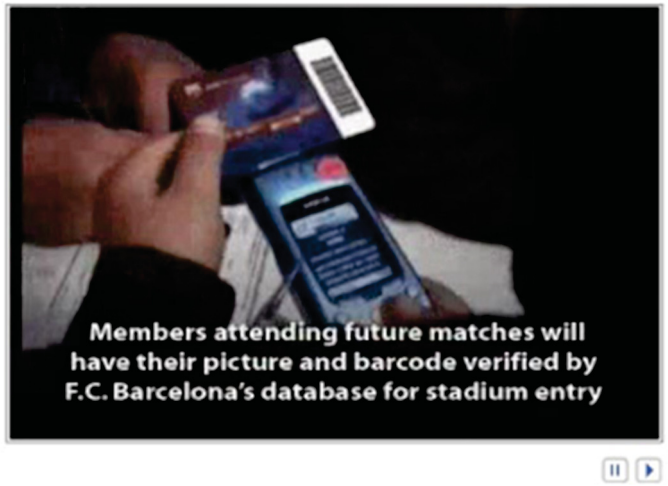
Claims	Prior Art
	ScanZoom (Forbes) at 1 New Technology Enables Camera Phones To Scan Bar Codes ScanZoom (Forbes) at 2 New York-based Scanbuy is one of those firms. The company's ScanZoom technology enables camera phone users to snap a picture of a bar code and then process that information from the bar code to either instruct the phone to launch certain applications or access specific information. For example, a shopper could take a picture of a bar code on the back of a book and then using ScanZoom software, go directly to Amazon.com and have the option of purchasing that book without ever entering any data. ScanZoom (Forbes) at 2 Similarly, on the enterprise side, a company could outfit employees with camera phones and use the devices similarly to a bar code reader and keep track of its inventory by ScanZoom (Forbes) at 2 Now some companies are looking at an innovative way to combine the rising popularity of camera phones with existing bar code scanning techniques to make data entry less cumbersome and open up the possibilities for mobile commerce applications. ScanZoom (Forbes) at 3 scanning bar codes on their products.

Claims	Prior Art
	ScanZoom (Forbes) at 3 Patents Pending Scanbuy executives say they have 14 patents pending on the ScanZoom technology, and the company recently purchased the intellectual property of International Wireless, which will allow Scanbuy to enhance its optical intelligence solutions. A Spanish operator is currently using ScanZoom technology to help manage ticket sales to high-profile soccer matches to keep season ticket holders from selling or giving their tickets to others. The soccer company sends its season ticket holders a notice in the mail with a bar code. The ticket holder brings the card to the stadium where ticket takers use Nokia 3650 handsets to scan the bar code from the card and take a photo of the ticket holder. This information is then sent to a server where a database is created with that ticket holder's information and photo and stored for future games. ScanZoom (Forbes) at 3 Of course, the success of using camera phones as bar code scanners relies upon the quality of the camera phone. According to Chai Outmezguine , director of business management at Scanbuy, many of the current camera phones take poor quality photos, making it difficult for the technology to read the bar code. To overcome that issue, the company has a process in which lower resolution photos taken by phones without an application programming interface are sent to the company's server. There, ScanZoom technology decodes the bar code and sends a link to the user via MMS or SMS. "Our technology is camera dependent. The better the camera, the easier the process," Outmezguine says.

Claims	Prior Art
	ScanZoom (Forbes) at 4 BREW Gets On board One big player that may give some life to this bar code scanning application is Qualcomm , with its BREW application platform. KDDI and Okinawa Cellular have launched the EZ Appli BREW application that allows subscribers to read two-dimensional codes on printed material. According to Ted Nozaki, senior manager of business development for Qualcomm Japan, many companies put bar codes on their executive business cards so that business people can scan the bar code and store the contact information in their devices. On the enterprise side, Nozaki says KDDI believes bar code scanning will have traction with applications such as logistics. ScanZoom (Forbes) at 4 Although the EZ Appli launched with the Kyocera A5502K handset, Qualcomm says that other handsets will follow. According to Mike Yuen, senior product manager with BREW developer relations at Qualcomm, because the EZ Appli is a BREW extension, any developer can take advantage of the technology and design applications for it. Likewise, any BREW camera phone could use the application, making EZ Appli's proliferation a fairly easy process. ScanZoom (Interview Video) at 0:00:01–0:00:05 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:07–0:00:11  ScanZoom (Interview Video) at 0:00:55 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:00:55–0:01:25  ScanZoom (Interview Video) at 0:01:25–0:01:33 

Claims	Prior Art
	ScanZoom (Interview Video) at 0:01:33–0:01:46  ScanZoom (Optical Intelligence) at 1 

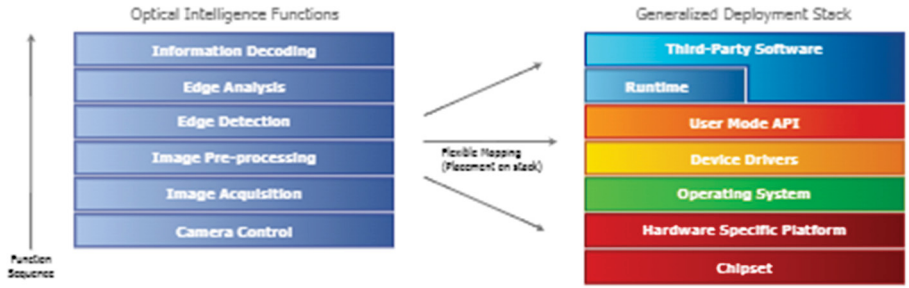
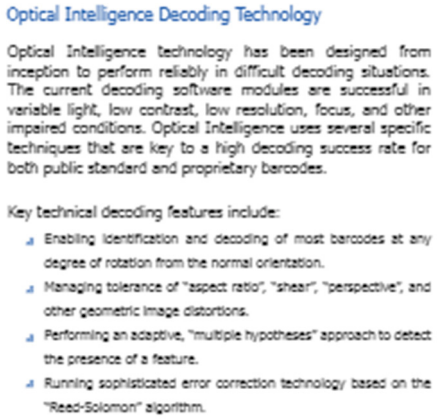
Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 ScanZoom enables users to launch applications and visit websites from mobile devices, such as cell phones, simply by pointing their digital camera equipped cell phones at or taking a snapshot of the barcode. This patent pending technology will open up new paradigms of business for OEM cell phone manufacturers, wireless carriers, and wireless application providers. ScanZoom is available on cellular phones, Pocket PCs and PDAs and is able to recognize multiple types of barcodes. With ScanZoom, consumers point at or take a snapshot of any barcode that could be displayed on products, catalogs, advertising, badges, business cards. ScanZoom decodes the barcode, and sends the information to the appropriate vendor. ScanZoom transforms camera phones and PDAs in personal Point of Sales or Internet Access Point. ScanZoom (Optical Intelligence) at 1 **USAGE:** • Users launch the application by clicking the Application icon. • User points the camera at the barcode. • Depending upon the version, decoding process begins as soon as application is launched or decoding process can be on user-initiated click. • The selected activity or application is launched. ScanZoom (Optical Intelligence) at 1 **KEY FEATURES:** • Links the real and virtual world with the barcode as its focal point. • Proprietary image processing algorithms optimize the barcode decoding process. • Launches any service or application (should have an associated UID). • Reads geometric distortions and skewed images. • Accessible to other application through proprietary APIs. • Reads barcodes in ambient light conditions. • Available in Symbian C++, Java versions, and eMbedded VC++ versions. ScanZoom (Optical Intelligence) at 1 **WHAT IS OPTICAL INTELLIGENCE?** Optical Intelligence enables camera equipped cell phones and other mobile devices with barcode-reading functionality. This technology will drastically change use of cell phones as we know it today as the biggest problem with the cell phones, namely the input mechanisms, is now solved. With the new generation of devices, ScanZoom will allow to send an email, give a call, access a website, download music or purchase items according to the data scanned.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 1 **Optical Intelligence for Mobile Devices** ScanZoom (Optical Intelligence) at 2 **POSSIBLE APPLICATIONS:** With these Optical Intelligence enabled camera phones, a consumer will be able to access information, communicate, or make a purchase. Following are a few examples of this robust technology: **Music Application** — On your newspaper, there is an advertisement announcing the release of the new record of your favorite singer and you want to hear their new single. On the bottom of the advertisement there is a barcode which will bring you to a specific website where the music can be downloaded to your so you can listen to it. If you like it you have the possibility to purchase the record. **Exhibition Application** — You go to an exhibition and you meet someone showing interest in your business. He gives you a business card with a printed barcode, or you just scan his barcoded badge. In this embedded barcode, you will have all his personal and business information. You will be able to download his information into contact list on your mobile device. **Information Services** — You find an interesting article in a magazine. You want to know more about the same subject, and you want to send the link to a friend. A barcode in the article will bring you to related articles; you can now access the related articles with your cell phone, and forward the link to your friend. **Dietary Application** — If you follow a diet, you must carefully select the ailments you buy. Therefore you scan the product barcodes, which will be mapped with your registered personal profile. According to your diet, the application will send you a warning message if needed before the purchase. **Ticketing** — You want to buy tickets to a Broadway show. You find barcodes on advertisements, or on Broadway's brochures. You scan the barcode which will take you to a website where you will find some reviews relating to the show you want to see and give you the opportunity to place your order.

Claims	Prior Art
	ScanZoom (Optical Intelligence) at 2 **ABOUT SCANBUY, INC:** Scanbuy's core expertise lies in web-based application development, allowing users to upload barcode data from a scanner (handheld scanner, PDA or cell phone, camera or scanner equipped device) to dedicated applications for processing sale orders, returning products, managing inventory, retrieving leads during exhibitions, controlling prescriptions, etc. Scanbuy's solutions enable companies to cut costs, improve customer service, bolster sales, and bring order to sprawling web sites with endless online information. Solutions are designed to be easily integrated within existing websites or e-business platforms of Scanbuy's customers. Scanbuy's solutions provide any user (procurement or inventory managers, physicians, exhibitors, etc.) with an intuitive graphic interface. In addition, no software installation on the user's computer is required. ScanZoom (Optical Intelligence) at 2 **OPTICAL INTELLIGENCE** 

Claims	Prior Art
	ScanZoom (Optical Intelligence Summary) at 1 Scanbuy's Optical Intelligence™ technology turns digital camera equipped devices such as camera phones into personal barcode scanners. Optical Intelligence™ reads and translates barcodes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today. Optical Intelligence enables camera phones to quickly and cost effectively capture and decode printed or electronically displayed barcodes. This technology allows immediate processing of this decoded information for use in limitless mobile commerce applications: streaming music, view trailers, download ringtones, access information... Camera phones become personal, wireless, and interactive barcode scanners. Smart phones get smarter! With ScanZoom, Scanbuy retail application, consumers can point at a barcode and immediately access multiple contents related to that code. ScanZoom sidesteps two of the most challenging obstacles to mobile commerce: tedious data entry and poor navigation. With its ability to capture Universal Product Codes (UPC), which are found on virtually all retail products or other barcode protocols - linear and two dimension codes - Optical Intelligence makes expensive laser barcode scanners and other cumbersome scanning hardware obsolete. Scanbuy provides the first optical-based software alternative to traditional laser-based scanning equipment. Optical Intelligence is available for camera phones, PDA with camera add-on and Web cams. This technology is designed to be used in both business and consumer environments. Optical Intelligence is primarily designed to be embedded in many levels on the handset architecture - on the chipset, within the software platform or on top of the Operating System. The barcode reader is also available to third party developers as SDKs to be integrated into their existing applications. ScanZoom (Trifold) at 1 What is Optical Intelligence? Scanbuy's Optical Intelligence™ technology enables camera-equipped mobile devices such as cell phones and PDAs with barcode reading functionality. Optical Intelligence™ reads and translates codes on-device through the use of low-cost CMOS imager based digital cameras. A proven technology, Optical Intelligence™ is available and being used in the market today.  ScanZoom (Trifold) at 1 Technical Summary: - Small-footprint barcode decoding engine - Time and memory efficient - Decode most linear and 2 dimensional barcodes - Support various image formats: BMP, PNG, JPG, YUV ScanZoom (Trifold) at 2 Deployment Options Optical Intelligence™ technology is designed to be embedded in many levels on the handset architecture or integrated within Scanbuy or third party developers' mobile applications. Primarily written in ANSI C, the decoding engine is also available in C++ or Java, and therefore can be ported to a wide variety of platforms.

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	ScanZoom (Trifold) at 2 **Optical Intelligence enables camera phones and other devices equipped with a digital camera to quickly and cost effectively capture and decode printed or electronically displayed barcodes.** ScanZoom (Trifold) at 2 Barcode Decoding Challenges Decoding barcode images from digital cameras embedded in consumer devices presents several major problems. These problems go beyond the challenges addressed in commercial barcode readers. Amongst the most critical challenges that Optical Intelligence technology overcomes are: - Performing under ambient lighting conditions and correcting shadows, overexposure, underexposure... - Addressing images distorted from skewed viewing angles with limited processing power and memory. - Performing the conversion from color data to gray-scale so that the maximum amount of information is preserved, making for a robust, easy to use reader. - Coping with moderate amounts of image focus global impairment due to distance and lens focal length issues. - Decoding barcode images with limited resolution: typically with a VGA (640x480) imager. - Handling image distortions that are localized to a specific region or form a changing gradient across the image. ScanZoom (Trifold) at 2 Product Architecture Scanbuy's Optical Intelligence technology has been designed to be highly portable on many different hardware orientations. One way this is achieved is through the particularly small footprint of the application – only 20 kB for its basic module! In addition, through the use of Optical Intelligence APIs, many different applications will be able to utilize the technology. It has been designed with a clear perspective regarding both functionality and its position within the hardware device architecture and software stack. This flexibility and strategy has enabled Optical Intelligence technology to exist in many different scenarios within the general device stack (hardware and software). It can be included on the chipset level, all the way up to separately installed software. The diagram below depicts both the technology functions and the general stack.

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	ScanZoom (Trifold) at 2  ScanZoom (Trifold) at 2  Optical Intelligence Decoding Technology Optical Intelligence technology has been designed from inception to perform reliably in difficult decoding situations. The current decoding software modules are successful in variable light, low contrast, low resolution, focus, and other impaired conditions. Optical Intelligence uses several specific techniques that are key to a high decoding success rate for both public standard and proprietary barcodes. Key technical decoding features include: • Enabling identification and decoding of most barcodes at any degree of rotation from the normal orientation. • Managing tolerance of "aspect ratio", "shear", "perspective", and other geometric image distortions. • Performing an adaptive, "multiple hypotheses" approach to detect the presence of a feature. • Running sophisticated error correction technology based on the "Reed-Solomon" algorithm. *See* claims 3, 4, 20. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
22. The system of claim 20, wherein the plurality of monitoring criteria Includes criteria based on light brightness, skewing, and warping.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 20, wherein the plurality of monitoring criteria Includes criteria based on light brightness, skewing, and warping." For example: *See* claim 5.

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	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
23. The system of claim 18, wherein the confirming that the mobile check deposit can go forward is performed after the transmitting the digital image of the check from the user's mobile device.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 18, wherein the confirming that the mobile check deposit can go forward is performed after the transmitting the digital image of the check from the user's mobile device." For example: *See* claim 6. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
24. The system of claim 18, wherein the digital image is a modified version of the captured video frame.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 18, wherein the digital image is a modified version of the captured video frame." For example: *See* claim 7. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
25. The system of claim 18, wherein the wireless network is a cellular network.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 18, wherein the wireless network is a cellular network." For example: *See* claim 8. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
26[pre]. A system enabling mobile check deposit auto-capture functionality via video frame processing, the system comprising:	To the extent the preamble is limiting, ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[a] system enabling mobile check deposit auto-capture functionality via video frame processing, the system." For example: *See* limitation 1[pre].

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	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26a] a mobile device of a user, the user's mobile device including a camera, a processor, and a memory coupled to the processor, the memory storing:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a mobile device of a user, the user's mobile device including a camera, a processor, and a memory coupled to the processor, the memory storing." For example: *See* limitation 1[a]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26b] a software abstraction layer, the software abstraction layer comprising Instructions that, when executed by the processor, control the camera; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a software abstraction layer, the software abstraction layer comprising Instructions that, when executed by the processor, control the camera." For example: *See* limitation 1[b]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26c] a downloaded app, the downloaded app associated with a bank to control check deposit by controlling the camera through the software abstraction layer, the downloaded app comprising Instructions that, when executed by the processor, cause the user's mobile device to perform operations including:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a downloaded app, the downloaded app associated with a bank to control check deposit by controlling the camera through the software abstraction layer, the downloaded app comprising Instructions that, when executed by the processor, cause the user's mobile device to perform operations including." For example: *See* limitation 1[c]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26d] providing Instructions to the user for capturing a check;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "providing Instructions to the user for capturing a check." For example:

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	See limitation 1[d]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26e] generating a live video of the check in a field of view of the camera, the downloaded app causing the live video to be generated by controlling the camera through the software abstraction layer;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "generating a live video of the check in a field of view of the camera, the downloaded app causing the live video to be generated by controlling the camera through the software abstraction layer." For example: *See* limitation 1[e]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26f] monitoring the live video of the check in the field of view of the camera with respect to at least one monitoring criterion;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "monitoring the live video of the check in the field of view of the camera with respect to at least one monitoring criterion." For example: *See* limitation 1[g]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26g] determining that a video frame of the live video of the check satisfies the at least one monitoring criterion and then automatically capturing the video frame;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "determining that a video frame of the live video of the check satisfies the at least one monitoring criterion and then automatically capturing the video frame." For example: *See* limitation 1[h]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26h] when the video frame of the live video of the check in the field of view of the camera is	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "when the video frame of the live video of the check in the field of view of the camera is determined to satisfy the at

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determined to satisfy the at least one monitoring criterion, providing feedback advising the user that the check has been captured;	least one monitoring criterion, providing feedback advising the user that the check has been captured." For example: *See* limitation 1[i]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26i] using a wireless network, transmitting a digital image of the check from the user's mobile device and submitting the check for mobile check deposit in the bank after automatically capturing the video frame, wherein the digital image is the captured video frame or is based on the captured video frame; and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "using a wireless network, transmitting a digital image of the check from the user's mobile device and submitting the check for mobile check deposit in the bank after automatically capturing the video frame, wherein the digital image is the captured video frame or is based on the captured video frame." For example: *See* limitation 1[j]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26j] confirming that the mobile check deposit can go forward after optical character recognition is performed on the check, a magnetic ink character recognition (MICR) line on the check is recognized, and an amount payable on the check is validated;	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "confirming that the mobile check deposit can go forward after optical character recognition is performed on the check, a magnetic ink character recognition (MICR) line on the check is recognized, and an amount payable on the check is validated." For example: *See* limitation 18[j]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26k] the system configured to perform image processing operations on an image of the check, the image processing operations including performing optical character recognition and	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "the system configured to perform image processing operations on an image of the check, the image processing operations including performing optical character recognition and verifying that the image of the check is acceptable for mobile check deposit, wherein the image of the check is the digital image transmitted by the user's mobile device or is based on the digital image transmitted by the user's mobile device." For example: *See* limitations 1[j], 1[n].

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verifying that the image of the check is acceptable for mobile check deposit, wherein the image of the check is the digital image transmitted by the user's mobile device or is based on the digital image transmitted by the user's mobile device; and	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[26l] a computer programmed to update a balance of an account at a financial Institution of the user to reflect an amount of funds associated with the check submitted for mobile check deposit by the user's mobile device, after the submitting the check for mobile check deposit in the bank, the confirming that the mobile check deposit can go forward, and the verifying that the image of the check is acceptable for mobile check deposit.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "a computer programmed to update a balance of an account at a financial Institution of the user to reflect an amount of funds associated with the check submitted for mobile check deposit by the user's mobile device, after the submitting the check for mobile check deposit in the bank, the confirming that the mobile check deposit can go forward, and the verifying that the image of the check is acceptable for mobile check deposit." For example: *See* limitation 1[o]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
27[pre]. The system of claim 26, wherein the downloaded app causes the user's mobile device to perform additional operations including:	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 26, wherein the downloaded app causes the user's mobile device to perform additional operations including." For example: *See* limitation 2[pre]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[27a] before determining that the video frame of the live video of the	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "before determining that the video frame of the live video of the check satisfies the at least one monitoring criterion,

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check satisfies the at least one monitoring criterion, determining that a different video frame of the live video of the check does not satisfy the at least one monitoring criterion; and	determining that a different video frame of the live video of the check does not satisfy the at least one monitoring criterion." For example: *See* limitation 2[a]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
[27b] after determining that the different video frame of the live video of the check does not satisfy the at least one monitoring criterion, providing feedback to the user.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "after determining that the different video frame of the live video of the check does not satisfy the at least one monitoring criterion, providing feedback to the user." For example: *See* limitation 2[b]. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
28. The system of claim 26, wherein the at least one monitoring criterion is a plurality of monitoring criteria based on two or more selected from a group consisting of light contrast, light brightness, check positioning, check dimensions, character spacing, skewing, warping, corner detection, edge detection, and magnetic ink character recognition (MICR) line detection.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 26, wherein the at least one monitoring criterion is a plurality of monitoring criteria based on two or more selected from a group consisting of light contrast, light brightness, check positioning, check dimensions, character spacing, skewing, warping, corner detection, edge detection, and magnetic ink character recognition (MICR) line detection." For example: *See* claim 3. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
29. The system of claim 28, wherein the plurality of monitoring criteria Includes a criterion based on magnetic ink character recognition (MICR) line detection.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 28, wherein the plurality of monitoring criteria Includes a criterion based on magnetic ink character recognition (MICR) line detection." For example: *See* claim 4.

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	This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.
30. The system of claim 26, wherein the wireless network is a cellular network.	ScanZoom discloses and/or renders obvious, at least under USAA's apparent infringement theories, "[t]he system of claim 26, wherein the wireless network is a cellular network." For example: *See* claim 8. This limitation also would have been obvious to a person of ordinary skill in the art based on (1) ScanZoom alone; (2) ScanZoom in combination with the general knowledge of a person of ordinary skill in the art; and/or (3) Regions' other invalidity charts and cover pleading.