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(54) **APPARATUS AND ASSOCIATED METHOD FOR DOWNLOADING AN APPLICATION WITH A VARIABLE LIFETIME TO A MOBILE TERMINAL**

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USPC **709/217**; 709/203; 705/54; 705/59; 707/959; 707/999.202; 707/999.203

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,757,533	A	7/1988	Allen et al.
4,893,248	A	1/1990	Pitts et al.
5,548,645	A	8/1996	Ananda
5,615,373	A	3/1997	Ho
5,649,187	A	7/1997	Hornbuckle

(Continued)

FOREIGN PATENT DOCUMENTS

EP	0778512 A	6/1997
EP	0 809 221	11/1997

(Continued)

OTHER PUBLICATIONS

Communication dated Apr. 4, 2007 for EP 00 660 234.6-1245.

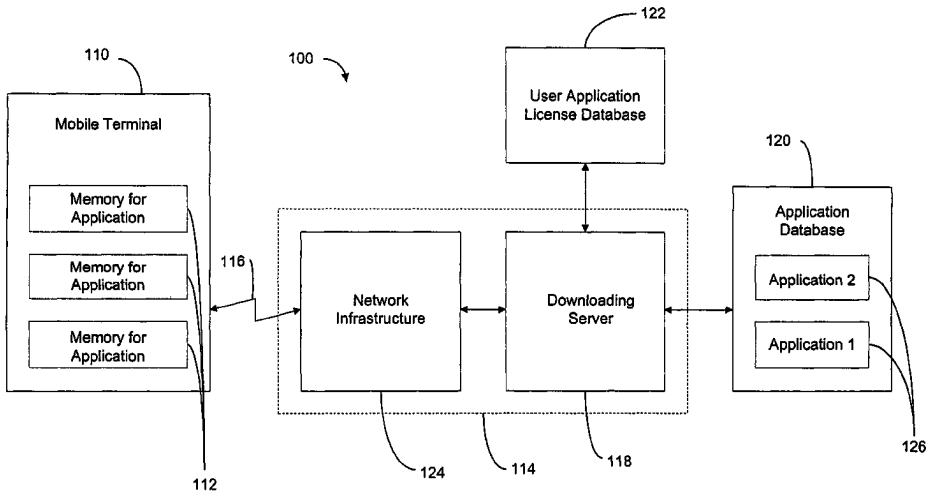
(Continued)

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(57) **ABSTRACT**

Apparatus, and associated method, provides for downloading an application with a selectable lifetime from an application database to a mobile terminal. The mobile terminal user's identification information and the selected lifetime for the application are stored in an application-license database. When the user seeks to download the same application on a subsequent occasion the user is able to download that application for a reduced fee if lifetime remains from when the application was first downloaded. In addition, the application may be configured to delete or uninstall itself from the mobile terminal when the selected lifetime for the application expires.

78 Claims, 4 Drawing Sheets



Geotab Exhibit 1056
Geotab v. Omega

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,652,613	A *	7/1997	Lazarus et al.	725/50
5,689,560	A	11/1997	Cooper et al.	
5,715,403	A *	2/1998	Stefik	705/44
5,790,664	A *	8/1998	Coley et al.	709/203
5,857,020	A	1/1999	Peterson, Jr.	
5,940,504	A *	8/1999	Griswold	705/59
5,953,005	A	9/1999	Liu	
6,005,938	A	12/1999	Banker et al.	
6,008,737	A	12/1999	Deluca et al.	
6,009,401	A	12/1999	Horstmann	
6,021,492	A	2/2000	May	
6,026,375	A	2/2000	Hall et al.	
6,034,621	A	3/2000	Kaufman	
6,075,862	A	6/2000	Yoshida et al.	
6,134,593	A	10/2000	Alexander et al.	
6,154,745	A	11/2000	Kari et al.	
6,173,446	B1 *	1/2001	Khan et al.	717/127
6,272,333	B1	8/2001	Smith	
6,343,280	B2 *	1/2002	Clark	705/55
6,349,257	B1	2/2002	Liu et al.	
6,356,543	B2	3/2002	Hall et al.	
6,360,255	B1 *	3/2002	McCormack et al.	709/221
6,366,791	B1 *	4/2002	Lin et al.	455/567
6,381,742	B2 *	4/2002	Forbes et al.	717/176
6,385,591	B1 *	5/2002	Mankoff	705/14.26
6,502,124	B1 *	12/2002	Shimakawa et al.	709/203
6,512,919	B2	1/2003	Ogasawara	
6,522,875	B1	2/2003	Dowling et al.	
6,546,002	B1 *	4/2003	Kim	370/351
6,574,239	B1	6/2003	Dowling et al.	
6,615,248	B1 *	9/2003	Smith	709/217
6,795,925	B2	9/2004	Colvin	
6,829,593	B1	12/2004	Ritter et al.	
6,832,230	B1 *	12/2004	Zilliacus et al.	707/203
6,898,708	B2	5/2005	Hori	
6,947,535	B2	9/2005	Ginzboorg et al.	
7,080,051	B1	7/2006	Crawford	
2001/0011253	A1 *	8/2001	Coley et al.	705/59
2002/0002042	A1 *	1/2002	Ishida	455/412
2003/0088516	A1 *	5/2003	Remer et al.	705/59
2004/0117664	A1	6/2004	Colvin	
2004/0243610	A1	12/2004	Ishiguro	
2005/0081042	A1	4/2005	Venkatesan et al.	
2005/0188228	A1	8/2005	DeMello et al.	

FOREIGN PATENT DOCUMENTS

EP	0817103	A2	1/1998
EP	0836132	A	4/1998
GB	2332126		6/1999
JP	10143357	A	5/1998
WO	WO93/01550	A	1/1993
WO	WO98/42098	A	9/1998
WO	9957875		11/1999

OTHER PUBLICATIONS

EP Search Report of EP 00660234 dated Nov. 22, 2005.

Kiniry, et al., "A Hands-on Look at Java Mobile Agents", IEEE 1997, pp. 21-30.

European Search Report for Application Serial No. 00660234.6-1245, dated Mar. 18, 2009.

* cited by examiner

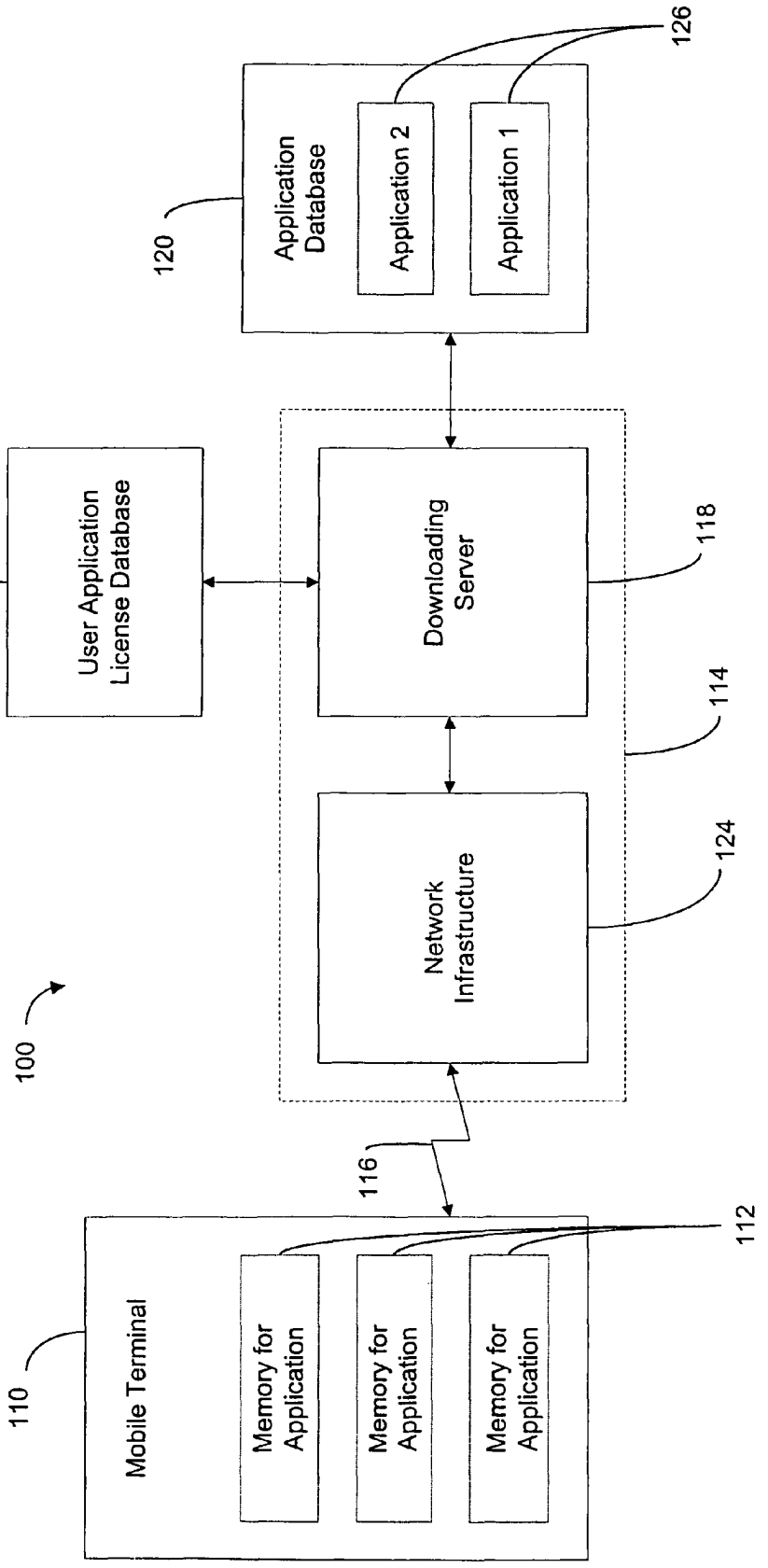

126
Application Database
Application 2
Application 1
120
122
User Application License Database
Downloading Server
118
114
Network Infrastructure
124
100
116
112
Mobile Terminal
Memory for Application
Memory for Application
Memory for Application
110

Figure 1

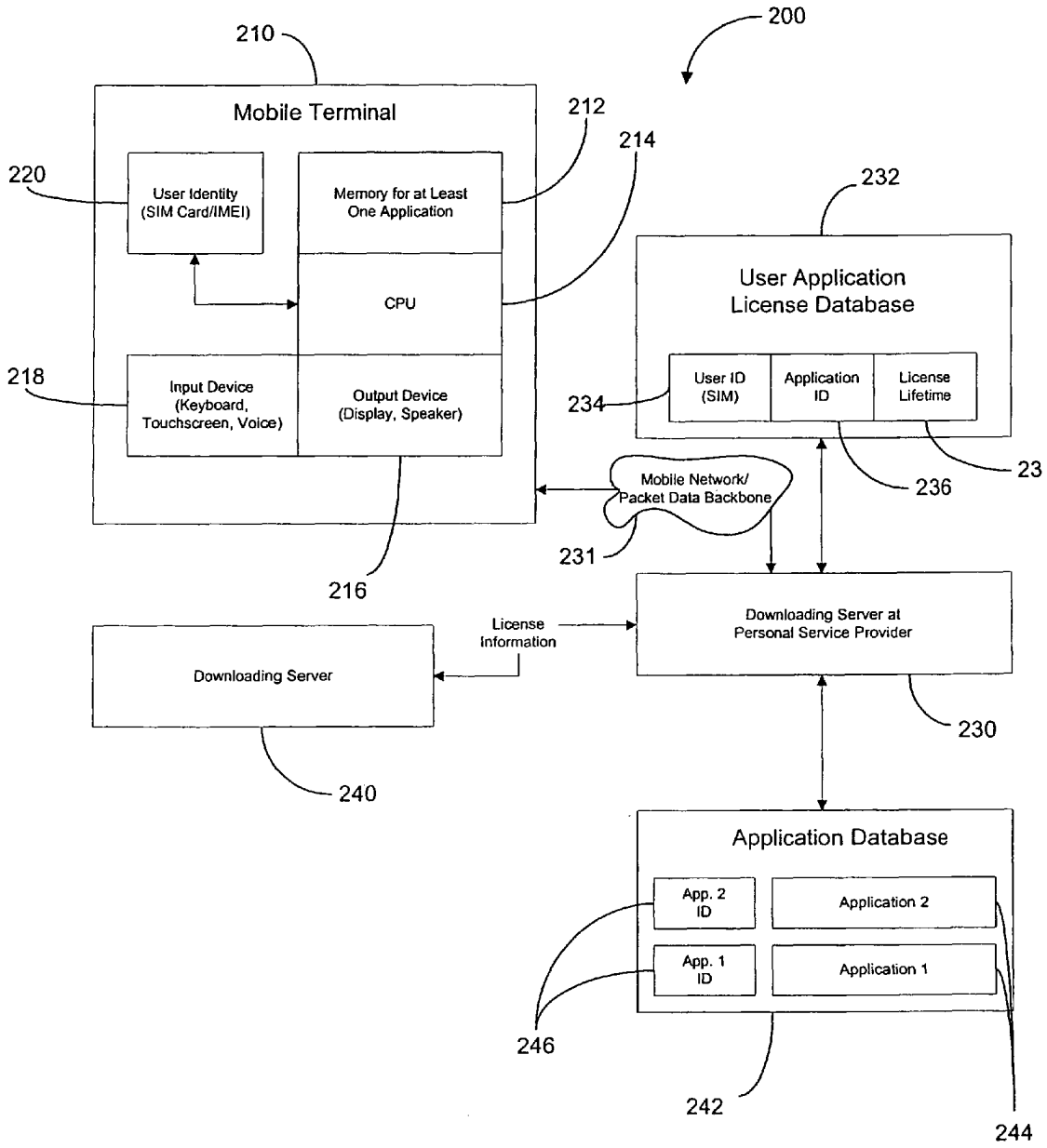

200
210
Mobile Terminal
212
214
220
User Identity (SIM Card/IMEI)
Memory for at Least One Application
CPU
218
Input Device (Keyboard, Touchscreen, Voice)
Output Device (Display, Speaker)
216
232
User Application License Database
User ID (SIM)
Application ID
License Lifetime
234
236
23
Mobile Network/ Packet Data Backbone
231
Downloading Server at Personal Service Provider
License Information
Downloading Server
230
240
Application Database
App. 2 ID
Application 2
App. 1 ID
Application 1
246
242
244

Figure 2

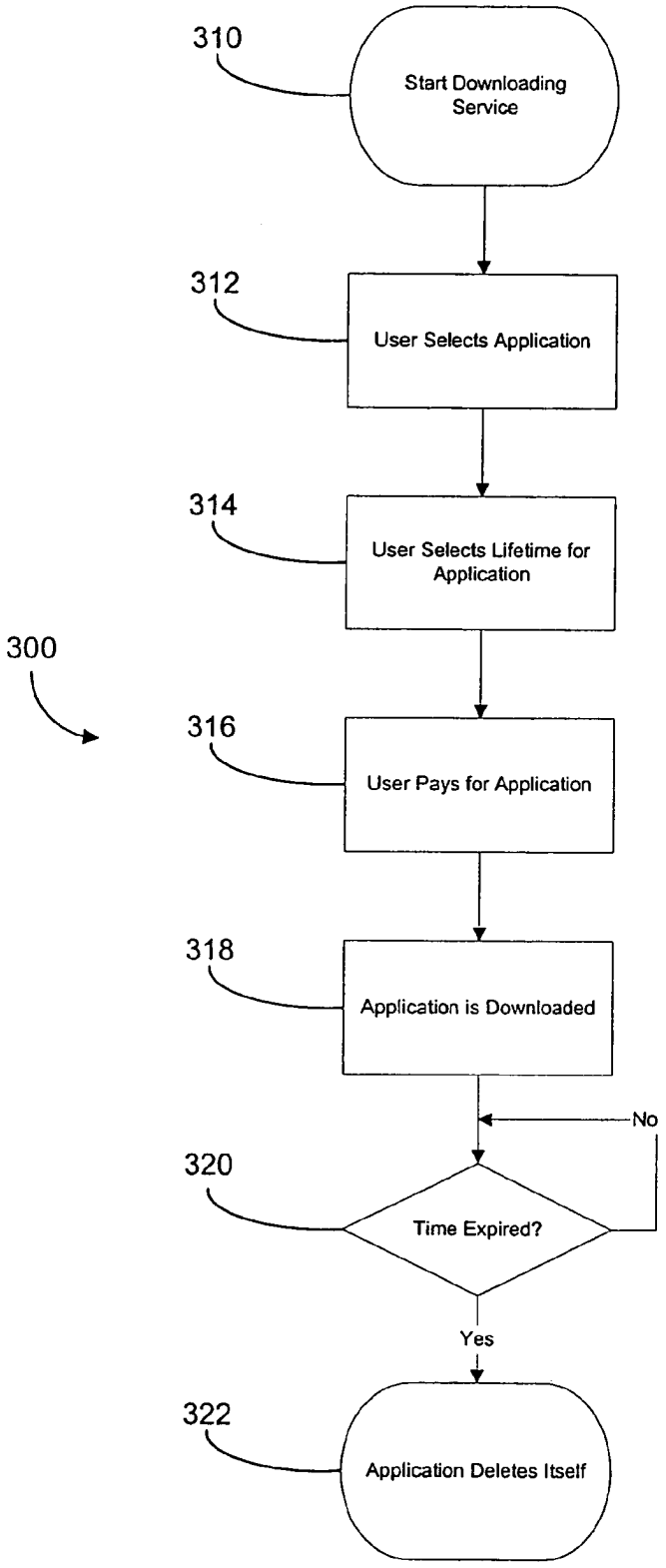

300
310
Start Downloading Service
312
User Selects Application
314
User Selects Lifetime for Application
316
User Pays for Application
318
Application is Downloaded
320
Time Expired?
No
Yes
322
Application Deletes Itself

Figure 3

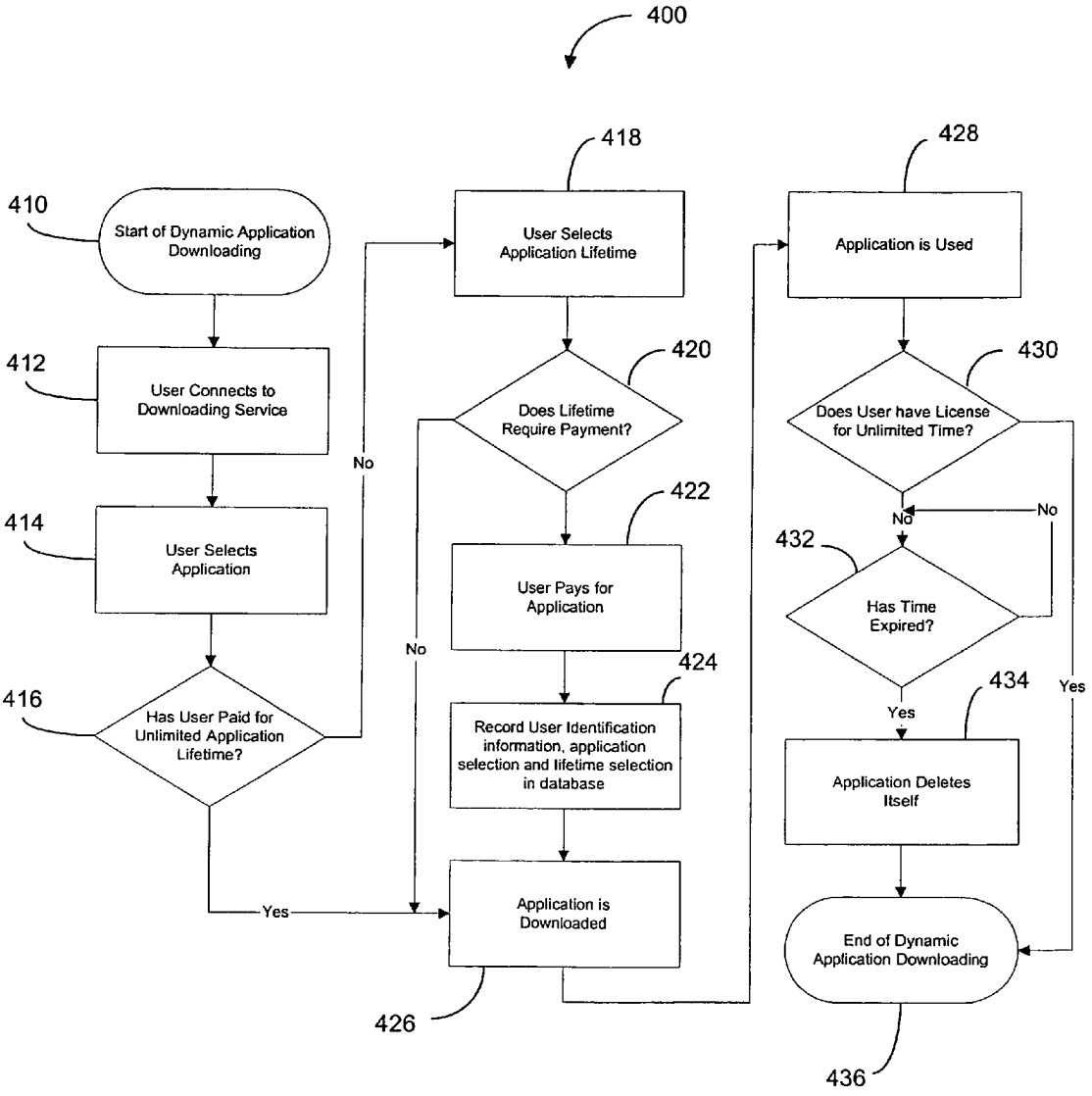

400
410
Start of Dynamic Application Downloading
412
User Connects to Downloading Service
414
User Selects Application
416
Has User Paid for Unlimited Application Lifetime?
No
Yes
418
User Selects Application Lifetime
420
Does Lifetime Require Payment?
No
422
User Pays for Application
424
Record User Identification information, application selection and lifetime selection in database
426
Application is Downloaded
428
Application is Used
430
Does User have License for Unlimited Time?
No
No
432
Has Time Expired?
Yes
434
Application Deletes Itself
Yes
End of Dynamic Application Downloading
436

Figure 4

APPARATUS AND ASSOCIATED METHOD FOR DOWNLOADING AN APPLICATION WITH A VARIABLE LIFETIME TO A MOBILE TERMINAL

Cross-Reference to Related Application

This Application is a continuation of U.S. patent application Ser. No. 09/470,303 filed on Dec. 22, 1999 now U.S. Pat. No. 6,832,230.

FIELD OF THE INVENTION

This invention relates to an apparatus and method for downloading content to a mobile terminal with communication capabilities.

BACKGROUND OF THE INVENTION

Recent years have witnessed the emergence and proliferation of the Internet, the World Wide Web ("WWW"), mobile communication technologies and mobile computing devices. As technology advances, telecommunications and computing are converging. Convergence is producing devices that communicate over networks and integrate media, telephony and computing.

Cellular communication networks, for example, allow subscribers to communicate both voice and nonvoice data. Typically, a subscriber pays a fee to obtain a subscription to a cellular network allowing the subscriber to use the network. The subscriber uses a mobile terminal to communicate on the cellular network. As technology advances, mobile terminals are increasingly constructed to be contained in smaller packages and also to provide greater functionality. One example, of a "mobile terminal" is the rapidly proliferating "cell phone."

The same technological advances that have fostered the proliferation of the cell phone have also fostered great advancements in computing devices. Computing devices are becoming increasingly smaller, faster, and more mobile. Technological advancement in computing devices and mobile terminals is blurring the line between them. Mobile terminals are integrating more and more capability typically associated with conventional computing devices. For example, cell phones are now able to run software applications and provide Internet access. Accordingly, the term "mobile terminal" shall herein refer to a broad range of devices (e.g. Personal Digital Assistants ("PDA"), Communicators, Smart Phones, and Personal Computers ("PC")) and not solely devices operable merely to communicate in a cellular communication system.

Mobile terminals utilize a range of processing circuitry to perform the functions described herein. The processing circuitry is generally capable of running, i.e., executing, content, also referred to herein as an application program. The terms content and application programs shall be used interchangeably herein and shall each refer to digital information. Content, executable or otherwise usable by the processing circuitry is typically stored at a memory device which is accessible by the processing circuitry. Downloading content to a mobile terminal is regularly performed. Oftentimes content is downloaded to a mobile terminal directly or indirectly utilizing the WWW. If an application is downloaded directly the mobile terminal has the capability to connect directly to the WWW. Whereas, if content is downloaded to a mobile terminal indirectly an intermediate device such as a PC is used. A Nokia 9000 Series™, for example, permits the downloading of content thereto by way of a cable or infrared connection from a source, such as a personal computer.

As noted above, existing mobile terminals are capable of receiving content downloaded thereto. Increased amounts of, and types of, content shall likely be available to be downloadable to a mobile terminal in the future. Some, and perhaps much, of such content is private-domain content. That is to say, an owner, or other entity, has property rights in such content, and is entitled to payment for use of such content. Convenient manners by which to market, distribute and pay for such content are needed.

Software application providers are using numerous pricing models to provide applications over the WWW to PC users. These models range from providing applications at no cost to full cost. "Freeware," as the term implies, refers to an application that a PC user is able to obtain without any payment. With freeware the user has full rights to the software, including the source code. Linux is an example of a freeware product. Some application providers do sell freeware, typically on a Compact Disk Read Only Memory ("CD-ROM"). However, the freeware is bundled with installation help programs and additional software. It is the packaging and additional software that is being paid for, not the freeware itself which is free by default.

"Shareware" is a term that refers to applications that PC users have full rights to at a low price. Typically, however, the payment is voluntary and sent directly to the developers of the application. In addition to freeware and shareware, some applications are simply sold at full price. Full price applications, are purchased by credit card or other money transaction and are fully functional from the start. The application is normally downloaded after the payment transaction has been processed.

In addition to the various pricing models discussed above for users to obtain applications, the functionality of downloaded applications can be restricted in several ways. "Time limited" applications are applications that are only usable for a certain time after which they become non-functional. Time limited applications generally are associated with an unlocking code wherein the user obtains the code when the purchase price is paid for and is then able to unlock the application, making it functional for a determined time. Transaction limited applications, are only functional for a set number of uses or starts. Like time limited applications, transaction limited operations generally operate with an unlocking code.

In contrast to time limited and transaction limited applications, limited functionality applications are first obtained for free or for a low price by a user with some key functions disabled. After paying the full price the disabled functions may be enabled or the fully functional application downloaded from the WWW. Limited dataset applications contain an incomplete dataset. Games are often available in a limited dataset where only the first level is available to the user. The limited dataset application is generally freeware, however, use of the complete dataset—the additional levels—requires payment of the purchase price.

In the environment of mobile terminals as compared to PC's unique problems are encountered with downloading applications that require new solutions. Ease of payment and user satisfaction are key considerations when determining how best to provide downloadable applications to mobile terminals. Possible payment methods include charging for the application along with the monthly bill, electronic cash, credit card charge and monthly membership fee. These payment methods along with those described herein for PC users

(i.e. freeware, shareware, full-price, and time-limited applications) present special problems when implemented for mobile terminals.

The various methods of distributing applications to PC users discussed above were developed in the PC environment. Mobile terminals, however, provide unique problems not encountered with traditional PCs. For example, current mobile terminals typically have less memory available for applications than current PCs. Current mobile terminal applications such as downloadable ringing tones are much less complex than typical PC applications. Accordingly, a mobile phone application cannot typically motivate a user to pay a price anywhere near PC application prices.

With any application PC, Mobile terminator otherwise, consumers would enjoy the ability to test or try out a new application without paying full price. Accordingly, a manner by which to permit a user to download and application for a limited time, pay a small price, and test or try out the application is desirable. In addition, mobile terminals generally have much less memory capacity, at the current time, than PC applications. Because of limited memory capacity, a user or the mobile terminal itself may have to eliminate an old application in memory to make room for a new application in memory. If a consumer has paid full price for several applications that do not fit in the memory of the users mobile terminal that user will not be willing to pay for the applications that do not fit. Therefore, a manner by which to permit a user to pay for an application once but be able to download that application on subsequent occasions for a reduced fee or at no cost would be desirable. Moreover, the installing and deinstalling of applications should be as simple and or automatic as possible providing the mobile terminal with an uncomplicated seamless experience. Accordingly, there is a need for new manners by which to provide applications to mobile terminals. The invention herein solves these problems.

SUMMARY OF THE INVENTION

An embodiment of the present invention provides a method that records user identity when downloading an application from a server to a mobile phone so that application later can be downloaded again without separate charge. An embodiment of the present invention also provides a method by which an application with limited lifetime on the mobile phone can uninstall itself and thus free memory space for new applications. The terms delete and uninstall are used interchangeably herein.

One embodiment of the present invention is an apparatus for a communication system. The communication system comprises a mobile terminal capable of communicating by way of a radio link with network infrastructure. The mobile terminal comprises memory for at least one application. The apparatus comprises an application database, a detector and an application-license database. The application database is coupled to the network infrastructure and contains at least a first application downloadable to the mobile terminal. The application(s) in the application database have a selectable lifetime during which the application is executable. In addition, the applications may be configured to delete or uninstall themselves from memory of the mobile terminal when their lifetime expires. The applications may be preprogrammed to delete themselves according to a preset lifetime or configured to delete themselves after the lifetime is selected. The lifetime may be calculated on time or transaction basis.

The detector is coupled to the network infrastructure and detects requests generated by the mobile terminal for downloading an application to the mobile terminal for a selected lifetime. The application-license database is also coupled to the network infrastructure and is configured to store the selected lifetime for the application. By storing the selected lifetime in the application-license database the user may download the same application at a later time for a lesser fee than originally paid for the application, if the lifetime for the application has not expired. The lesser fee includes paying no fee for subsequent downloads.

Another embodiment of the present invention is a method for downloading an application to a mobile terminal from an application database containing at least a first application. The application has a selectable lifetime during which the application is executable. The lifetime may be preprogrammed in the application or programmed in the application after the lifetime is selected. When the user of the mobile terminal chooses an application to download, the user also selects the lifetime for that application during which the application is executable. The lifetime may be determined on a transaction or time basis. The application is then downloaded to the mobile terminal from an application database. The user's identification and lifetime selection is also stored in an application-license database.

When the application is downloaded to the mobile terminal it may be configured to delete itself or uninstall itself from memory of the mobile terminal when the lifetime expires. In addition, the user may be required to pay a fee for the application when it is first downloaded. However, because the user selects, and may pay for, a lifetime and that lifetime is stored in the application-license database the user is able to download the same application at a later time for a reduced fee or no fee depending on the lifetime remaining for the application.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a functional block diagram comprising the devices and modules of a communication system in which an embodiment of the present invention is operable;

FIG. **2** illustrates another functional block diagram of the communication system shown in FIG. **1** here further illustrating the devices and modules used during operation of an embodiment of the present invention;

FIG. **3** illustrates a flowchart describing the operation of an embodiment of the present invention; and

FIG. **4** illustrates another flowchart describing the operation of a further embodiment of the present invention.

DETAILED DESCRIPTION

Referring first to FIG. **1**, a communication system, shown generally at **100**, provides for communications with a mobile terminal **110**. Within the mobile terminal **110** is at least one memory unit **112** for storing an application. The mobile terminal **110** is connected to a network **114** by way of communication path, here a radio link **116**. The network **114** comprises network infrastructure **124** and a downloading server **118**. The network infrastructure **124** comprises various hardware devices and associated software for receiving and processing signals transmitted upon the radio link **116** by the mobile terminal. In the exemplary implementation in which the network **114** is a cellular communication network, the signals form electromagnetic signals.

The network infrastructure **124** is connected to a downloading server **118**. The downloading server **118** and, in turn, the network infrastructure **124** is connected to both an application database **120** and an application-license database **122**. The application-license database **122** comprises data about

each mobile terminal users application licenses. The application-license database **122** is accessible by the downloading server **118** whenever a mobile terminal user attempts to download an application. The application-license database **122** stores individual mobile terminal users' application licensing information including lifetime selections. The lifetime selections are discussed below along with FIGS. **3** and **4**.

The application database **120** stores various applications **126**. The applications **126** are available for downloading to the mobile terminal **110** via the downloading server **118** and other necessary network infrastructure **114**.

Referring to FIG. **2**, a communication system, here shown generally at **200**, again provides for communications with a mobile terminal, here mobile terminal **210**. The mobile terminal **210** comprises an input device **218**, an output device **216**, a Central Processing Unit ("CPU") **214**, memory for at least one application **212** and a user identity module **220**. The range of possible input devices **218** includes, e.g., a keyboard, a touchscreen and a voice recognition module. The range of possible output devices **216** includes, e.g., a display screen and a speaker.

The user identity module **220**, in the exemplary implementation, is formed of a Subscriber Identity Module ("SIM") at which an International Mobile Equipment Identity ("IMEI") is stored. Both the SIM and the IMEI are specified in the Global System for Mobile Communication ("GSM") technical standards. Although this specification refers to GSM devices, it is not intended to be limited to GSM devices. In a GSM network the user's subscription identity to the network is contained in the SIM. The SIM allows the GSM network to identify the mobile terminal user. The SIM is linked to a user's subscription to the GSM network and not a particular mobile terminal and therefore may be used with different mobile terminals. A GSM mobile terminal is identified by the IMEI. An IMEI is a unique 15-digit number. The SIM in conjunction with the IMEI identify the user and the user's mobile terminal to the GSM network.

The mobile terminal **210** is able to communicate with a downloading server **230** at the personal service provider by way of a mobile network and packet data backbone **231**. The server **230** is linked to an application-license database **232** and an application database **242**. The application-license database comprises user identification information **234**, user application selections **236** and application lifetime information **238**. The user identification information **234** may comprise both SIM and IMEI information. The application selections **236** may comprise both current and past application selections. The application lifetime information **238** is discussed further below along with FIGS. **3** and **4**.

The application database **242** contains the applications available for downloading to the mobile terminal. The application database **242** comprises at least one application **244** and an application identifier **246** associated with the application. Two applications, application **1** and application **2**, are shown in the FIGS. **1** and **2** for purposes of example.

In the case of a mobile terminal user having a subscription to a particular cellular network, that user communicates by way of the mobile network, as part of the subscription, and the packet data backbone **231**. The user, however, may communicate over other networks for a fee or change subscriptions. Moreover, a user may desire to download applications while using another network. Accordingly, in the exemplary implementation, the packet data backbone portion of the mobile network and backbone **231** is a public backbone, such as the Internet backbone so that the license information stored in the user application database **232** is accessible in other manners through the public backbone.

Referring to FIG. **3**, a flowchart, shown generally at **300**, illustrates operation of one embodiment of the present invention. At block **310** a mobile terminal user starts a downloading service. A downloading service provides applications for mobile terminals. The downloading service may be accessed directly by the mobile terminal, indirectly from a PC or otherwise. A downloading service is oftentimes implemented in the form of a website, either commercial or non commercial. The website provides links to various applications available for download. If the downloading service is run indirectly on a PC, the application is first downloaded to the PC. The mobile terminal must then allow the downloading of the application from the PC to the mobile terminal. Downloading from a PC to a mobile terminal, for example, is implemented in a Nokia 9000 Series™ mobile terminal by way of a cable or infrared connection.

At block **312**, the user chooses an application. Choosing an application, in the case of a website implemented downloading service, may be achieved by selecting the link to that application. After clicking the link to an application, at block **314** the user selects a lifetime for the application. The lifetime represents the time during which the application will be executable and/or the time during which the application will reside in the memory of the mobile terminal. The application chosen is automatically configured, before downloading, to cease functioning or delete itself from the memory of the mobile terminal after the selected lifetime expires.

The user, at block **314** has a plurality of choices for lifetimes. The price of the application, at block **316**, may be dependent on the selected lifetime. For example, use of the application three times may be free, use of the application ten times or for one week may be $2.00, use of the application 100 times or for a month may be $5.00 and use of the application for an unlimited amount of time may be $10.00.

At block **316**, the user pays for the application. The payment price may be dependent on the selected lifetime. For example, if the user selects a lifetime of one week the user pays $2.00. After the application is paid for, the application is downloaded to the mobile terminal at block **318**. The lifetime of the application may be tracked by the application itself, by the downloading service or otherwise. If the application tracks its own lifetime, the application is automatically configured at downloading to delete itself according to the user's selected lifetime. In the example above the application would automatically delete itself after one week. If the user had selected ten uses instead of one week, the application would automatically delete itself after ten uses.

Deletion comprises freeing all memory space used by the application and corresponding data or only freeing some specified portion of the memory space used by the application. For example, when the lifetime expires the application deletes its own executable code, however, the application's corresponding data and libraries are not deleted. If the application is customized by the mobile terminal user, the customized settings are retained even after the application deletes itself. Accordingly, if the same application is downloaded on a subsequent occasion the user's customized settings are retained.

At block **320**, the application determines if it's lifetime has expired. If so, the application deletes itself at block **322**. If not, the application does not delete itself and allows the user to continue using the application.

Referring to FIG. **4**, reference numeral **400** refers to another flowchart illustrating further operation of an embodiment of the present invention. At block **410** a dynamic application downloading sequence is started. The first operation is connecting to a downloading service at block **412**. As men-

tioned earlier in conjunction with the description of FIG. **3**, the downloading service may run directly on the user's mobile terminal, indirectly on a PC or otherwise. The downloading service may be accessed through a website. The website provides links to various applications available for download. If the downloading service is run indirectly on a PC, the mobile terminal must allow the downloading of the application from the PC to the mobile terminal. This may be achieved by way of a cable or infrared connection between the PC and the mobile terminal.

The user's identity information (e.g. SIM and IMEI information) is also supplied to the downloading service. If the downloading service is run directly on the mobile terminal, the user's identity information SIM information and IMEI information is automatically transmitted to the downloading service. If the downloading service is run directly on the mobile terminal, the user's identity information is automatically transmitted to the downloading service. The user identity information is then stored in the application-license database **122** or **232**, referring to FIGS. **1** and **2** respectively.

At block **414**, the user selects an application. If the downloading service is implemented in a website, the user selects the link to that application. The downloading service then determines if the user has previously paid for an unlimited application lifetime at block **416**. For example, referring to FIG. **2**, the downloading service through the downloading server **230** will compare the user's identity **220** to user identification information **234** in the application-license database **232**. If there is a match between the current user identity **220** and user identity information **234** in the database, a further comparison is made to determine the licensing information **236**, **238** for the user. The license-database **232** keeps track of a particular users current and past application selections and the lifetime for those applications. If the user previously paid for an unlimited application lifetime the license-database **232** will contain that information. If the user has previously paid for an unlimited lifetime the application is downloaded at block **426** without a reduced fee or without a fee for the application. Note, because the user has paid for an unlimited lifetime the user may be able to download the application to multiple mobile terminals—wherever he or she has plugged in their SIM card.

Block **416** may be modified to determine if the user has lifetime remaining from a previously paid for application, even if the user has not paid for an unlimited application lifetime. This is especially important in current mobile terminals with little memory available for applications. If a user needs to download an application to his or her mobile terminal when there is no memory available to store the application, the user will have to delete an existing application or an application may be deleted automatically to make room for the new application. The deleted application may have lifetime remaining. Accordingly, the license-database **232** stores the application lifetimes **238** for each application a particular user has selected. If at block **416** the downloading service determines that life remains from a previous selection of the application, the application is downloaded to the user's mobile terminal **110** at block **426** and stored in a memory element **112**. When an application is downloaded to a mobile terminal **110** at block **416** with lifetime remaining, the application is configured to automatically delete itself from the memory **112** of the mobile terminal **110** when the remaining lifetime expires.

If the user has not paid for an unlimited lifetime on a previous occasion or does not have lifetime remaining from a previous selection, the user must now select the desired lifetime for the application at block **418**. Available lifetimes correspond to different payment requirements. At block **420** the downloading service determines if the selected lifetime requires payment. For example, use of the application three times or for a week may be free whereas use of the application ten times or for a month may be $2.00. If the lifetime selected does not require payment the application is downloaded to the user's mobile terminal **110** at block **426** and stored in memory **112**. If the application does require payment the user pays for the application at block **422**. Payment methods include credit card charging, electronic cash, monthly fee or membership, and charging along with network subscription and use payments (e.g. the cell phone bill). The application, before downloading at block **426**, is automatically configured to delete itself when the selected lifetime **418** expires.

At block **424** the downloading service records the user's identification information in the application-license database **232**. As discussed earlier, the user identification information includes the application selection, and application lifetime selection for the user. In a GSM network, the user identification information will also include SIM and IMEI information. After the user has paid for the application at block **422** and the user's information is recorded at block **424**, the selected application is downloaded to the user's mobile terminal **110** and stored in memory **112** at block **426**. Downloading may occur directly to the mobile terminal or indirectly to a PC or otherwise. If indirectly, the application must then be downloaded from the PC to the mobile terminal using some type of link such as an infrared connection or a cable.

If during the selection process and downloading process represented by blocks **412** through **426**, it is determined that there is insufficient memory for a new application there are several possible results. First, the downloading operation may be cancelled either automatically or manually by the user. Second, the user may choose to remove an existing application from his or her mobile terminal. In the latter case, if the user has selected to remove an application with lifetime remaining the user can later download this application at a reduced cost or at no cost if the user does so while lifetime remains for the deleted application. The ability to download an application with remaining lifetime is discussed above in reference to block **416**.

Once the application is downloaded at block **426** the user may use the application **428**. Each time the user subsequently attempts to use the application, the application queries itself to determine if it has an unlimited lifetime **430**. If the application determines that it doesn't have an unlimited lifetime, the application determines if its lifetime has expired at block **432**. If the lifetime has not expired, the user may use the application. If the lifetime has expired, the application automatically deletes itself at block **434**.

The apparatus and method described herein provides a manner by which a mobile terminal user may download an application to a mobile terminal and select a lifetime for that application. By storing the user's identity, application selection and lifetime selection in a license-database that is accessible by a downloading service, the user is able to download the same application to a mobile terminal on subsequent occasions for a reduced fee. Moreover, the application deletes itself automatically from the mobile terminals memory after its lifetime expires. The features of this invention provide a convenient manner by which to obtain applications and try applications for a limited time. Moreover, the features of this invention provide a convenient manner by which to free-up memory in a mobile terminal by deleting an application and then obtaining the deleted application later on without having to pay twice for the application.

The invention also provides a convenient manner by which to obtain applications on an as needed basis. The user can then effectively use many more applications than would otherwise be possible if the applications had to permanently reside in the mobile terminal memory or be paid for every time they were downloaded to the mobile terminal. This feature is especially important given the portable nature of mobile terminals.

The previous descriptions are of preferred examples for implementing the invention, and the scope of the invention should not necessarily be limited to this description. The scope of the invention is defined by the following claims:

The invention claimed is:

1. A method comprising:

connecting a first mobile terminal to an application database through a cellular communication network, the application database containing at least one application having a variable selectable lifetime;

receiving a user-specified choice of a chosen application from the at least one application for downloading to the first mobile terminal;

providing the application database with information identifying a user of the first mobile terminal;

receiving a user-specified selection of a variable lifetime for the chosen application, during which lifetime the chosen application is executable;

downloading the chosen application from said application database to the first mobile terminal; and

storing indicia of the selected lifetime for the chosen application and of the information identifying the user, wherein the indicia corresponds to the selected lifetime for the chosen application during which the chosen application is further executable at mobile terminals accessible by the user.

2. The method of claim **1**, wherein the step of downloading the chosen application is performed over a wireless connection.

3. The method of claim **2**, wherein the step of downloading over a wireless connection is performed through the cellular communication network.

4. The method of claim **2**, wherein the step of downloading over a wireless connection is achieved by way of a short-range connection.

5. The method of claim **4**, wherein the short-range connection is an infrared connection.

6. The method of claim **1**, wherein the indicia is stored in an application-license database in connection with the application database.

7. The method of claim **1**, wherein the information identifying the user is based on Subscriber Identity Module (SIM) information.

8. The method of claim **1**, further comprising the steps of:

receiving in the application database a request from the user for a subsequent downloading of a previously-downloaded application;

determining whether lifetime remains by reference to stored indicia of a selected lifetime for a previously-downloaded application for the user; and

downloading the previously-downloaded application a subsequent time, if it is determined that at least a portion remains of the selected lifetime for the previously-downloaded application for the user.

9. The method of claim **8**, wherein the request is received from a second mobile terminal.

10. The method of claim **8**, wherein the subsequent downloading comprises downloading the previously-downloaded application to a second mobile terminal.

11. The method of claim **8**, further comprising the step of refusing the request for the subsequent downloading if a determination indicates that lifetime has expired in the stored indicia of the selected lifetime for the previously-downloaded application for the user.

12. The method of claim **8**, wherein the step of downloading the previously-downloaded application the subsequent time is performed over a wireless connection.

13. The method of claim **12**, wherein the step of downloading the previously-downloaded application the subsequent time over the wireless connection is performed through the cellular communication network.

14. The method of claim **12**, wherein the step of downloading the previously-downloaded application the subsequent time over the wireless connection is achieved by way of a short-range connection.

15. The method of claim **14**, wherein the short-range connection is an infrared connection.

16. The method of claim **1**, wherein the lifetime is a period of time measured from a predetermined starting time.

17. The method of claim **16**, wherein the predetermined starting time is the time of downloading the chosen application.

18. The method of claim **1**, wherein the lifetime is a predetermined number of downloads.

19. Apparatus comprising:

a network infrastructure configured to communicate with at least one mobile terminal;

an application database containing at least one downloadable application, the at least one downloadable application having a user-selectable variable lifetime during which the application is permitted to remain executable by an identified user;

a downloading server configured to communicate through the network infrastructure and configured to detect a request containing information identifying a user to download a chosen application of the at least one downloadable application contained in the application database, the downloading server being further configured to obtain the chosen application from the application database, and to download the chosen application to the at least one mobile terminal; and

an application-license database coupled to the downloading server, the application-license database configured to store a selected variable lifetime and the user-identifying information for the chosen application;

wherein the downloading server is configured to compare the download request to the selected variable lifetime and the user-identifying information stored in the application-license database for the chosen application, wherein the downloading server is further configured to download the chosen application if the user has application lifetime remaining for the chosen application.

20. The apparatus of claim **19** wherein said chosen application is preprogrammed with the selected variable lifetime, wherein the chosen application is configured to delete itself from the at least one mobile terminal when the selected variable lifetime expires.

21. The apparatus of claim **19**, wherein the selected variable lifetime expires as a function of a selected number of transactions.

22. The apparatus of claim **19**, wherein the selected variable lifetime expires as a function of a selected time.

23. Apparatus comprising:

a central processing unit (CPU);

a memory unit coupled with the CPU and configured to store at least one application;

an application requestor coupled with the CPU and configured to generate requests to download a variable-lifetime application from an application database;

a lifetime selector coupled with the CPU and configured to select a variable lifetime applicable to a downloaded application;

a lifetime determiner coupled with the CPU and configured to determine a remaining portion of the variable lifetime applicable with the downloaded application; and

an application disabler coupled with the CPU and configured to disable an application;

wherein the apparatus is operable to receive and store the downloaded application and to permit the downloaded application to be executed at the mobile terminal as long as a portion of its applicable variable lifetime remains.

24. The apparatus of claim **23**, wherein the application disabler is configured to disable an application when the associated lifetime has expired.

25. The apparatus of claim **23**, wherein the application disabler is configured to delete an application with lifetime remaining in order to free storage space in the memory unit.

26. The apparatus of claim **23**, wherein the application requester is operable to request a previously-downloaded application for which at least a portion of the associated lifetime remains.

27. The apparatus of claim **23**, wherein the memory unit also stores lifetime indicia associated with downloaded applications.

28. A method comprising:

receiving a selected choice of a first application from a mobile terminal, the first application being one of a plurality of applications; and

receiving the first application via a wireless network, the first application being configured to become unavailable for use on the mobile terminal upon either

expiration of a time period selectable by a user of the mobile terminal, or

use of the first application a number of times selectable by a user of the mobile terminal.

29. The method of claim **28**, wherein the wireless network is a cellular communication network.

30. The method of claim **28**, wherein the wireless network comprises short-range wireless communication.

31. The method of claim **30**, wherein the short-range wireless communication comprises an infrared connection.

32. The method of claim **28**, further comprising receiving a user-selected time period for the first application from the mobile terminal.

33. The method of claim **28**, further comprising receiving a user-selected number of times the first application may be used from the mobile terminal.

34. The method of claim **28**, wherein the first application is configured to become unavailable by becoming non-functional.

35. The method of claim **28**, wherein the first application is configured to become unavailable by automatically deleting at least a portion of itself.

36. The method of claim **35**, wherein the first application is configured to delete only executable code.

37. The method of claim **35**, wherein the first application is configured to retain customized settings in the mobile terminal.

38. The method of claim **28**, further comprising:

subsequently receiving a re-selected choice of the first application; and

again receiving the first application if time remains in the time period.

39. The method of claim **28**, further comprising:

subsequently receiving a re-selected choice of the first application; and

again receiving the first application if the first application has been used less than the number of times.

40. The method of claim **28**, further comprising:

paying for the first application, wherein an amount of said paying is based on either the time period or the number of times.

41. The method of claim **28**, further comprising:

making an initial payment for the first application;

subsequently receiving another selection of the first application;

again receiving the first application if there is time remaining in the time period; and

making additional payment for said again receiving the first application, wherein an amount of said additional payment is reduced from an amount of the initial payment.

42. The method of claim **28**, further comprising:

making an initial payment for the first application;

subsequently receiving another selection of the first application;

again receiving the first application if the first application has been used less than the number of times; and

making additional payment for said again receiving the first application, wherein an amount of said additional payment is reduced from an amount of the initial payment.

43. The method of claim **28**, further comprising:

determining, at each attempt to use the first application, whether time remains in the time period, and

deleting the first application if time does not remain in the time period.

44. The method of claim **28**, further comprising:

determining, at each attempt to use the first application, whether the first application has been used less than the number of times, and

deleting the first application if the first application has been used the number of times.

45. The method of claim **28**, wherein said receiving a selected choice comprises selecting a link at a website.

46. The method of claim **28**, further comprising deleting a pre-existing application to create memory space for the first application.

47. The method of claim **28**, wherein the first application is a game.

48. The method of claim **28**, wherein the first application contains executable digital information.

49. A method comprising steps of:

receiving a choice of a first ringing tone at a mobile terminal, the first ringing tone being one of a plurality of ringing tones; and

receiving the first ringing tone via a wireless network, the first ringing tone being configured to become unavailable for use on the mobile terminal upon either

expiration of a user-selectable time period, or

use of the first ringing tone a user-selectable number of times.

50. The method of claim **49**, wherein the wireless network is a cellular network.

51. The method of claim **49**, wherein the wireless network comprises short-range wireless communication.

52. The method of claim **51**, wherein the short-range wireless communication comprises an infrared connection.

53. The method of claim 49, further comprising receiving at the mobile terminal the user-selectable time period for the first ringing tone.

54. The method of claim 49, further comprising receiving at the mobile terminal the user-selectable number of times the first ringing tone may be used.

55. The method of claim 49, further comprising:

subsequently receiving a re-selection of the first ringing tone; and

again receiving the first ringing tone if there is time remaining in the user-selectable time period.

56. The method of claim 49, further comprising:

subsequently receiving a re-selection of the first ringing tone; and

again receiving the first ringing tone if the first ringing tone has been used less than the user-selectable number of times.

57. The method of claim 49, further comprising:

paying for the first ringing tone, wherein the amount of said payment is based on either the user-selectable time period or the user-selectable number of times.

58. The method of claim 49, further comprising:

making an initial payment for the first ringing tone;

subsequently receiving a re-selection of the first ringing tone;

again receiving the first ringing if there is time remaining in the user-selectable time period; and

making additional payment for said again receiving the first ringing tone, wherein an amount of said additional payment is reduced from an amount of the first payment.

59. The method of claim 49, further comprising:

making an initial payment for the first ringing tone;

subsequently receiving a re-selection of the first ringing tone;

again receiving the first ringing tone if the first ringing tone has been used less than the user-selectable number of times; and

making additional payment for said again receiving the first ringing tone, wherein an amount of said additional payment is reduced from an amount of the first payment.

60. The method of claim 49, wherein said receiving a choice comprises selecting a link at a website.

61. Apparatus comprising:

a memory; and

a central processing unit (CPU), wherein the apparatus is configured to perform

transmitting over a wireless communication network a choice of a first application, the first application being one of a plurality of applications,

receiving the first application via the wireless network, the first application being configured to become unavailable for use on the apparatus upon either

expiration of a user-selectable time period, or

use of the first application a user-selectable number of times, and

storing the first application in the memory.

62. The apparatus of claim 61, wherein the wireless network is a cellular communication network.

63. The apparatus of claim 61, wherein the wireless network comprises short-range wireless communication.

64. The apparatus of claim 63, wherein the short-range wireless communication comprises an infrared connection.

65. The apparatus of claim 61, wherein the mobile terminal is further configured to transmit a selection of the user-selectable time period for the first application.

66. The apparatus of claim 61, wherein the mobile terminal is further configured to transmit a selection of the user-selectable number of times the first application may be used.

67. The apparatus of claim 61, wherein the first application is configured to become unavailable by becoming non-functional.

68. The apparatus of claim 61, wherein the first application is configured to become unavailable by automatically deleting at least a portion of itself.

69. The apparatus of claim 68, wherein the first application is configured to delete only executable code.

70. The apparatus of claim 68, wherein the first application is configured to retain customized settings in the apparatus.

71. The apparatus of claim 61, wherein the apparatus is further configured to

transmit a subsequent re-choice of the first application, and

again receive the first application if time remains in the user-selectable time period.

72. The apparatus of claim 61, wherein the apparatus is further configured to

transmit a subsequent re-choice of the first application; and

again receive the first application if the first application has been used less than the user-selectable number of times.

73. The apparatus claim 61, wherein the apparatus is further configured to

determine, at each attempt to use the first application, whether time remains in the user-selectable time period, and

delete the first application if time does not remain in the user-selectable time period.

74. The apparatus of claim 61, wherein the apparatus is further configured to

determine, at each attempt to use the first application, whether the first application has been used less than the user-selectable number of times, and

delete the first application if the first application has been used the user-selectable number of times.

75. The apparatus of claim 61, wherein said transmitting a choice comprises transmitting a selection of a link at a website.

76. The apparatus of claim 61, wherein the first application is a ringing tone.

77. The apparatus of claim 61, wherein the first application is a game.

78. The apparatus of claim 61, wherein the first application contains executable digital information.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO.	: 8,856,266 B2
APPLICATION NO.	: 10/777284
DATED	: October 7, 2014
INVENTOR(S)	: Zilliacus et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims

In Column 14, Claim 73, Line 33

Please delete "apparatus claim" and replace with --apparatus of claim--.

Signed and Sealed this
Twenty-first Day of April, 2015

Michelle K. Lee

Michelle K. Lee
Director of the United States Patent and Trademark Office