

Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

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Title of Invention

COMPLETE VEHICLE ECOSYSTEM

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Entity Status

Applicant claims small entity status under 37 CFR 1.27

- ☐ Yes, applicant qualifies for small entity status under 37 CFR 1.27
- ☒ No

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Signature	/Douglas W. Swartz/			Date (YYYY-MM-DD)	2012-06-22
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COMPLETE VEHICLE ECOSYSTEM

BACKGROUND

[0001] Whether using private, commercial, or public transport, the movement of people and/or cargo has become a major industry. In today's interconnected world daily travel is essential to engaging in commerce. Commuting to and from work can account for a large portion of a traveler's day. As a result, vehicle manufacturers have begun to focus on making this commute, and other journeys, more enjoyable.

[0002] Currently, vehicle manufacturers attempt to entice travelers to use a specific conveyance based on any number of features. Most of these features focus on vehicle safety, or efficiency. From the addition of safety-restraints, air-bags, and warning systems to more efficient engines, motors, and designs, the vehicle industry has worked to appease the supposed needs of the traveler. Recently, however, vehicle manufactures have shifted their focus to user and passenger comfort as a primary concern. Making an individual more comfortable while traveling instills confidence and pleasure in using a given vehicle, increasing an individual's preference for a given manufacturer and/or vehicle type.

[0003] One way to instill comfort in a vehicle is to create an environment within the vehicle similar to that of an individual's home or place of comfort. Integrating features in a vehicle that are associated with comfort found in an individual's home can ease a traveler's transition from home to vehicle. Several manufacturers have added comfort features in vehicles such as the following: leather seats, adaptive and/or personal climate control systems, music and media players, ergonomic controls, and in some cases Internet connectivity. However, because these manufacturers have added features to a conveyance, they have built comfort around a vehicle and failed to build a vehicle around comfort.

SUMMARY

[0004] There is a need for a vehicle ecosystem that can integrate both physical and mental comforts while seamlessly operating with current electronic devices to result in a totally intuitive and immersive user experience. These and other needs are addressed by the various aspects, embodiments, and/or configurations of the present disclosure. Also, while the disclosure is presented in terms of exemplary embodiments, it should be appreciated that individual aspects of the disclosure can be separately claimed.

[0005] The present disclosure can provide a number of advantages depending on the particular aspect, embodiment, and/or configuration. Currently, the vehicle industry is dominated by conveyances offering a separate comfort experience from a home, work, or other aspect of a traveler's life. Unfortunately, current vehicles include a series of separate devices that work together while an individual or individuals are associated with the vehicle. Technology areas and devices such as user interfaces, applications, tracking capabilities, hardware, and/or location-based communications, could be combined together, or used separately, to form a complete vehicle ecosystem. This ecosystem can provide a connected and intuitive user experience for any traveler.

[0006] At least one embodiment of the present disclosure describes using a series of devices associated with a vehicle along with other devices to form a complete and familiar user experience. In particular, the devices, applications, interfaces, hardware, and software may combine to form a user-friendly environment while traveling or otherwise moving from one location to another and/or when a vehicle is at rest. Moreover, aspects of the present disclosure may provide communication between the vehicle and a user at any given time. Specifically, communication between a vehicle and another device may also relay information to an individual and/or group of individuals. This communication between a vehicle and at least one other device may include, but is not limited to, communication between a vehicle and: 1) at least one mobile device, 2) at least one other vehicle, 3) another system/group of devices, 4) a non-mobile device, and 5) combinations thereof. These and other advantages will be apparent from the disclosure.

[0007] The phrases "at least one", "one or more", and "and/or" are open-ended expressions that are both conjunctive and disjunctive in operation. For example, each of the expressions "at least one of A, B and C", "at least one of A, B, or C", "one or more of A, B, and C", "one or more of A, B, or C" and "A, B, and/or C" means A alone, B alone, C alone, A and B together, A and C together, B and C together, or A, B and C together.

[0008] The term "a" or "an" entity refers to one or more of that entity. As such, the terms "a" (or "an"), "one or more" and "at least one" can be used interchangeably herein. It is also to be noted that the terms "comprising", "including", and "having" can be used interchangeably.

[0009] The term "automatic" and variations thereof, as used herein, refers to any process or operation done without material human input when the process or operation is performed.

However, a process or operation can be automatic, even though performance of the process or operation uses material or immaterial human input, if the input is received before performance of the process or operation. Human input is deemed to be material if such input influences how the process or operation will be performed. Human input that consents to the performance of the process or operation is not deemed to be “material”.

[0010] The term “computer-readable medium” as used herein refers to any tangible storage and/or transmission medium that participate in providing instructions to a processor for execution. Such a medium may take many forms, including but not limited to, non-volatile media, volatile media, and transmission media. Non-volatile media includes, for example, NVRAM, or magnetic or optical disks. Volatile media includes dynamic memory, such as main memory. Common forms of computer-readable media include, for example, a floppy disk, a flexible disk, hard disk, magnetic tape, or any other magnetic medium, magneto-optical medium, a CD-ROM, any other optical medium, punch cards, paper tape, any other physical medium with patterns of holes, a RAM, a PROM, and EPROM, a FLASH-EPROM, a solid state medium like a memory card, any other memory chip or cartridge, a carrier wave as described hereinafter, or any other medium from which a computer can read. A digital file attachment to e-mail or other self-contained information archive or set of archives is considered a distribution medium equivalent to a tangible storage medium. When the computer-readable media is configured as a database, it is to be understood that the database may be any type of database, such as relational, hierarchical, object-oriented, and/or the like. Accordingly, the disclosure is considered to include a tangible storage medium or distribution medium and prior art-recognized equivalents and successor media, in which the software implementations of the present disclosure are stored.

[0011] The term “desktop” refers to a metaphor used to portray systems. A desktop is generally considered a “surface” that typically includes pictures, called icons, widgets, folders, etc. that can activate show applications, windows, cabinets, files, folders, documents, and other graphical items. The icons are generally selectable to initiate a task through user interface interaction to allow a user to execute applications or conduct other operations.

[0012] The term “display” refers to a portion of a screen used to display the output of a computer to a user.

[0013] The term “displayed image” refers to an image produced on the display. A typical displayed image is a window or desktop. The displayed image may occupy all or a portion of the display.

[0014] The term “display orientation” refers to the way in which a rectangular display is oriented by a user for viewing. The two most common types of display orientation are portrait and landscape. In landscape mode, the display is oriented such that the width of the display is greater than the height of the display (such as a 4:3 ratio, which is 4 units wide and 3 units tall, or a 16:9 ratio, which is 16 units wide and 9 units tall). Stated differently, the longer dimension of the display is oriented substantially horizontal in landscape mode while the shorter dimension of the display is oriented substantially vertical. In the portrait mode, by contrast, the display is oriented such that the width of the display is less than the height of the display. Stated differently, the shorter dimension of the display is oriented substantially horizontal in the portrait mode while the longer dimension of the display is oriented substantially vertical. The multi-screen display can have one composite display that encompasses all the screens. The composite display can have different display characteristics based on the various orientations of the device.

[0015] The term “gesture” refers to a user action that expresses an intended idea, action, meaning, result, and/or outcome. The user action can include manipulating a device (e.g., opening or closing a device, changing a device orientation, moving a trackball or wheel, etc.), movement of a body part in relation to the device, movement of an implement or tool in relation to the device, audio inputs, etc. A gesture may be made on a device (such as on the screen) or with the device to interact with the device.

[0016] The term “module” as used herein refers to any known or later developed hardware, software, firmware, artificial intelligence, fuzzy logic, or combination of hardware and software that is capable of performing the functionality associated with that element.

[0017] The term “gesture capture” refers to a sense or otherwise a detection of an instance and/or type of user gesture. The gesture capture can occur in one or more areas of the screen. A gesture region can be on the display, where it may be referred to as a touch sensitive display or off the display where it may be referred to as a gesture capture area.

[0018] A “multi-screen application” refers to an application that is capable of producing one or more windows that may simultaneously occupy multiple screens. A multi-screen application commonly can operate in single-screen mode in which one or more windows of the application

are displayed only on one screen or in multi-screen mode in which one or more windows are displayed simultaneously on multiple screens.

[0019] A “single-screen application” refers to an application that is capable of producing one or more windows that may occupy only a single screen at a time.

[0020] The term “screen,” “touch screen,” or “touchscreen” refers to a physical structure that enables the user to interact with the computer by touching areas on the screen and provides information to a user through a display. The touch screen may sense user contact in a number of different ways, such as by a change in an electrical parameter (e.g., resistance or capacitance), acoustic wave variations, infrared radiation proximity detection, light variation detection, and the like. In a resistive touch screen, for example, normally separated conductive and resistive metallic layers in the screen pass an electrical current. When a user touches the screen, the two layers make contact in the contacted location, whereby a change in electrical field is noted and the coordinates of the contacted location calculated. In a capacitive touch screen, a capacitive layer stores electrical charge, which is discharged to the user upon contact with the touch screen, causing a decrease in the charge of the capacitive layer. The decrease is measured, and the contacted location coordinates determined. In a surface acoustic wave touch screen, an acoustic wave is transmitted through the screen, and the acoustic wave is disturbed by user contact. A receiving transducer detects the user contact instance and determines the contacted location coordinates.

[0021] The term “window” refers to a, typically rectangular, displayed image on at least part of a display that contains or provides content different from the rest of the screen. The window may obscure the desktop.

[0022] The terms “determine,” “calculate” and “compute,” and variations thereof, as used herein, are used interchangeably and include any type of methodology, process, mathematical operation or technique.

[0023] It shall be understood that the term “means” as used herein shall be given its broadest possible interpretation in accordance with 35 U.S.C., Section 112, Paragraph 6. Accordingly, a claim incorporating the term “means” shall cover all structures, materials, or acts set forth herein, and all of the equivalents thereof. Further, the structures, materials or acts and the equivalents thereof shall include all those described in the summary of the invention, brief description of the drawings, detailed description, abstract, and claims themselves.

[0024] The term “vehicle” as used herein includes any conveyance, or model of a conveyance, where the conveyance was originally designed for the purpose of moving one or more tangible objects, such as people, animals, cargo, and the like. The term “vehicle” does not require that a conveyance moves or is capable of movement. Typical vehicles may include but are in no way limited to cars, trucks, motorcycles, busses, automobiles, trains, railed conveyances, boats, ships, marine conveyances, submarine conveyances, airplanes, space craft, flying machines, human-powered conveyances, and the like.

[0025] The preceding is a simplified summary of the disclosure to provide an understanding of some aspects of the disclosure. This summary is neither an extensive nor exhaustive overview of the disclosure and its various aspects, embodiments, and/or configurations. It is intended neither to identify key or critical elements of the disclosure nor to delineate the scope of the disclosure but to present selected concepts of the disclosure in a simplified form as an introduction to the more detailed description presented below. As will be appreciated, other aspects, embodiments, and/or configurations of the disclosure are possible utilizing, alone or in combination, one or more of the features set forth above or described in detail below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] Fig. 1A depicts a configurable console in accordance with one embodiment of the present disclosure;

[0027] Fig. 1B depicts a configurable console in accordance with another embodiment of the present disclosure;

[0028] Fig. 2 illustrates a configurable dash display in accordance with embodiments of the present disclosure;

[0029] Fig. 3 depicts a configurable heads-up display in accordance with embodiments of the present disclosure;

[0030] Fig. 4 depicts a user-configurable device in accordance with embodiments of the present disclosure;

[0031] Fig. 5 depicts a gesture recognition aspect of interfacing with the vehicle ecosystem in accordance with the present disclosure;

[0032] Fig. 6 depicts an application store and interface with a vehicle in accordance with the present disclosure;

- [0033] Fig. 7 shows a device sharing an application and/or media with a vehicle console in accordance with an embodiment of the present disclosure;
- [0034] Fig. 8 shows an in-cloud and push connection for vehicle multimedia in accordance with at least one embodiment of the present disclosure;
- [0035] Fig. 9 depicts a music streaming application in accordance with embodiments of the present disclosure;
- [0036] Fig. 10 illustrates a vehicle system where the activation of mobile phone and other connected device features is dependent on specific laws in accordance with embodiments of the present disclosure;
- [0037] Fig. 11 illustrates an insurance tracking system in accordance with embodiments of the present disclosure;
- [0038] Fig. 12 shows a law enforcement monitoring system in accordance with embodiments of the present disclosure;
- [0039] Fig. 13 depicts an etiquette suggestion application in accordance with embodiments of the present disclosure;
- [0040] Fig. 14 depicts a parking space finder in accordance with embodiments of the present disclosure;
- [0041] Fig. 15 depicts a parking meter status application and associated devices in accordance with embodiments of the present disclosure;
- [0042] Fig. 16 depicts an object sensing system in accordance with embodiments of the present disclosure;
- [0043] Fig. 17 depicts a proximity warning system to determine and alert the presence of adjacent vehicles in accordance with embodiments of the present disclosure;
- [0044] Fig. 18 illustrates a sensing method where elements and usage may be controlled based on environmental factors in accordance with embodiments of the present disclosure;
- [0045] Fig. 19 shows a system that may be used to determine an accurate location of a vehicle in accordance with embodiments of the present disclosure;
- [0046] Fig. 20 shows a universal bus for a vehicle communication system in accordance with embodiments of the present disclosure;
- [0047] Fig. 21 depicts a mobile network of a vehicle in accordance with embodiments of the present disclosure;

[0048] Fig. 22 depicts a universal console chassis in accordance with embodiments of the present disclosure;

[0049] Fig. 23 depicts a central repository for vehicle information in accordance with embodiments of the present disclosure;

[0050] Fig. 24 depicts a real-time traffic system in accordance with embodiments of the present disclosure ;

[0051] Fig. 25 depicts a system where map data is updated from vehicles and associated devices according to embodiments of the present disclosure;

[0052] Fig. 26 depicts a vehicle ecosystem capable of providing accurate indications for purposes of service and maintenance in accordance with embodiments of the present disclosure; and

[0053] Fig. 27 depicts a vehicle ecosystem capable of exchanging information with public records databases for the purposes of general awareness in accordance with embodiments of the present disclosure.

[0054] In the appended figures, similar components and/or features may have the same reference label. Further, various components of the same type may be distinguished by following the reference label by a letter that distinguishes among the similar components. If only the first reference label is used in the specification, the description is applicable to any one of the similar components having the same first reference label irrespective of the second reference label.

DETAILED DESCRIPTION

[0055] Presented herein are embodiments of a complete vehicle ecosystem. The ecosystem can comprise single devices or a compilation of devices. This device, or these devices, may be capable of communicating with other devices and/or to an individual or group of individuals. Further, this device, or these devices, can receive user input in unique ways. The overall design and functionality of each device provides for an enhanced user experience making the device more useful and more efficient. As described herein, the device(s) may be electrical, mechanical, electro-mechanical, software-based, and/or combinations thereof.

[0056] User Interface:

[0057] Fig. 1A depicts a configurable vehicle console in accordance with embodiments of the present disclosure. In the prior art vehicle consoles are known to include physical and/or

electrical controls for the manipulation of certain vehicle features. For example, vehicles may include climate control, audio control, and other preferences available from a main console. The adjustment of these controls may be achieved through physical and/or touch-screen manipulation of dials, knobs, switches, keys, buttons, and the like. Custom configurability of the controls is limited on current touch-screen consoles and virtually impossible on physical consoles. In both touch-screen and physical consoles, the console remains permanently hard-wired to the vehicle.

[0058] In one embodiment of the present disclosure a removable console is described. Specifically, the present disclosure is directed to a console that can be simply and repeatably detached and reattached. In some cases, a console of a vehicle may span across, or be separated into, one or more individual screens. The present disclosure anticipates detaching at least one of these console screens. This detachable console screen may have its own processor, memory, and power source. Furthermore, the detachable console screen may be operated as a tablet or portable computing platform. Alternatively, the device may be tethered to the vehicle for use inside a predefined area.

[0059] In some embodiments, the detachable console may interface with the vehicle, and/or other consoles, via an attachment point. The attachment point may include an electrical interface and a locking feature. This locking feature may allow removal and/or prevent removal of the detachable console based on specific rules. Furthermore, the locking feature may be configured to provide a rest portion where the detachable console may reside during a connected operation with the vehicle.

[0060] It is one aspect of the present disclosure the detachable console may provide its location to the vehicle and/or other associated device. For instance, if the detachable console is removed from an area adjacent to the vehicle, an alert may indicate its removal from the predefined area. This alert may be sent to a mobile device (e.g., text message). Additionally, the alert may be an audible and/or visual alert to those adjacent to the vehicle. Moreover, the detachable console may provide a signal that can be analyzed to determine location. This signal may be continuously and/or selectively sent according to specific rules.

[0061] Referring now to Fig. 1B, a configurable vehicle console is illustrated in accordance with embodiments of the present disclosure. Specifically, the configurable console is shown to incorporate various features and controls. These controls and/or features may be selectively and adjustably moved, sized, and/or otherwise adjusted on the console to display to suit a user's

desires. It is one aspect of the present disclosure to allow for the integration of custom designed templates of standard console layouts that users may manipulate and/or modify. These modifications may be saved and stored.

[0062] Further, users may select certain controls and/or features to display in any given position on the console. For example, if a user wishes to have constant access to the climate-control settings of a vehicle, the user may place a “climate-control” module on the configurable console. The position and/or features of this module may be adjusted according to rules and its position may be arranged as desired by the user. It is anticipated that recommended positions for the module, or modules, could be provided by the vehicle console system. If a user wishes to add a “music control” module to the console the user can similarly select position, size, and/or other features associated with the module to best suit the user’s needs. A user may access a respective or selected console display configuration from among a plurality of different console display configurations by inputting a code or identifier. The result is that different users of a common vehicle or common make, year, and model can have differently configured console displays.

[0063] In some embodiments, these modules may be programmed to disappear, dim, or exhibit other functions in response to some type of stimulus. For example, the user may want one or more control modules to dim upon driving. Alternatively, the user may want one or more modules to disappear according to a timer or other stimulus. It is anticipated that the stimulus may include user input, timers, sensors, programmed conditions, and the like.

[0064] For example, in the event of an accident, access to a vehicle’s music, climate control and/or other non-essential modules is of little benefit. In an emergency scenario, the console may use one or more sensors, possibly including vehicle sensor (e.g., air bag sensor, gyroscope, or accelerometer), to detect the accident and provide emergency features to a user via the console. These features may replace the standard modules arranged on the console (e.g., the music and climate modules are minimized or removed, replaced by one or more emergency modules). A large “hazard” light module may be created. Additionally or alternatively, an emergency contact module may be provided to allow the user easy access to an emergency communication channel. Contacting the emergency channel could be left to the discretion of the user. As can be appreciated by one skilled in the art, these emergency modules may

automatically contact an emergency channel and/or use timers and other sensors to determine whether to initiate contact with the emergency channel.

[0065] In accordance with the present disclosure, it is anticipated that the vehicle may use sensors in an individual's phone or other device to detect a specific user's heartbeat and/or monitor a user's other vital signs. These vital signs could be relayed to an emergency contact to aid in possible treatment and/or evaluate a necessary emergency response. Using a phone's, or other device's, gyroscope and/or accelerometer to detect a user's heartbeat could be achieved via storing conditions at a time prior to an accident and comparing the stored conditions to those obtained during the emergency. In the event that a user has associated his or her phone and/or device with the vehicle console, this process of monitoring, sending, and using the vital sign information could be achieved automatically by the console and/or vehicle.

[0066] Fig. 2 illustrates a configurable dash display in accordance with embodiments of the present disclosure. Currently, the layouts of most vehicle dashboard displays are static in nature. Specifically, users have limited access to modifying the appearance of their vehicle's instrument panel or dashboard. Typically, these users have access to only adjust the light intensity and in some instances background/foreground colors of a dashboard or instrument panel display. In other words, users cannot fully configure a dashboard or its display.

[0067] It is one embodiment of the present disclosure to provide a totally configurable dashboard display. In some embodiments, instruments and information such as readouts, indicators, gauges, and the like can be chosen to appear on the dashboard. These instruments may be digital, analog, simulated analog, simulated digital, or other output capable of being displayed to the dashboard. It is further anticipated that the scale of these instruments can be customized to meet a user's preferences. For example, a simulated analog speedometer may be chosen because of its design aesthetic and adjusted to read miles-per-hour or kilometers-per-hour in a given range. If the user wishes to have a more accurately displayed simulated-analog output the user may wish to set the maximum value displayed on the speedometer to a lower number (e.g., 75 mph).

[0068] It is anticipated that some embodiments of the configurable dashboard may employ the emergency features described above in the configurable console. In some embodiments the configurable dashboard may share features with the configurable console and vice versa.

Additionally, these units may be one or more displays that communicate with each other to form a part of the complete vehicle ecosystem

[0069] When at least one instrument is chosen for the configurable dashboard, it may be moved into a user-desired position on or off the dash panel. Alternatively, the dashboard may provide an automatic arrangement feature to automatically position at least one chose instrument in a predefined or recommended position on the dash panel.

[0070] In accordance with the present disclosure, specific gauges may be hidden, deleted, or programmed to hide/disappear after start-up or some other predetermined input; however, the system may prevent certain gauges from being hidden/deleted. Preventing the hiding of gauges may depend on country, federal, state, local, or other laws. For example, the vehicle may determine that it is within a specific jurisdiction and therefore may require certain gauges be shown at all times. This jurisdiction determination may be made by the vehicle ecosystem using location-based features, such as GPS, WiFi access points, cell tower signals, and the like. Further, a vehicle's location may be determined by another device associated with the vehicle, one that is not necessarily part of the vehicle. In an embodiment, the location of a vehicle may be determined from the location-based features available on a user's mobile phone, or other location-aware device.

[0071] In the event that a user has customized a dashboard, and crosses a defined legal boundary (like a state or country border) the current location of the vehicle will define the laws to which the vehicle and associated devices and capabilities must adhere. The original, and other, configuration preferences of a user may be stored in memory. Once the user returns to a geographical location that allows the preset configuration preferences, the configurable dashboard can access the stored memory and may return the dashboard to the preset configuration. It is anticipated that specific geographical location laws could be preprogrammed into a device with which the vehicle communicates, whether the device is on-board or remotely located from the vehicle.

[0072] As can be appreciated, traveling across different legal boundaries and/or geographical locations, where certain instruments may be required and consequently appear and disappear from a dashboard may cause confusion to a user. It is an embodiment of the present disclosure to provide an indication to the user that a specific instrument is required in the given location and/or area. In some embodiments, the user may receive a notification upon crossing a legal

boundary. In yet another embodiment, where an instrument is required and added to the dashboard, the instrument itself may contain information that it is a required instrument in the territory in which the vehicle is located. For example, if territory "X" requires an odometer to be a part of the dashboard display, the odometer may appear on the dashboard with a highlighted or otherwise emphasized "X" marker to identify the requirement and the jurisdiction. Capabilities of the console may be enabled or disabled based on vehicle location. For example, communication modes, such as texting, tweeting, email, and the like may be enabled or disabled based on vehicle location. Vehicle location may be mapped against applicable laws of a governmental entity, such as a city, municipality, county, province, state, country, and the like. Alternatively, capabilities of the console may be enabled or disabled based on contract requirements, employer rules or policies, etc.

[0073] In some embodiments, the configurable dashboard, and/or console, preferences may be stored by the user. These preferences may be stored locally inside the vehicle. Alternatively, the preferences may be stored remotely from the vehicle. It is anticipated that at least one embodiment provides for the storing of preferences both remotely and locally. Additionally, the preferences may be linked to a user's key fob, which indicates a specific user and presets the layout. In some instances, preferences may be stored on a memory on the key fob and/or key.

[0074] Referring now to Fig. 3, an embodiment of a configurable heads-up display is depicted. It is at least one aspect of the present disclosure to allow at least one user to configure a heads-up display with instruments and other information to provide at least one user with an optimal view and function. In some embodiments, the configurable heads-up display may exhibit substantially similar behavioral features as the configurable dashboard and/or console described above. In addition, the configurable heads-up display may include features from the dashboard, the console, and/or other devices to display in a heads-up manner. In one embodiment, the heads-up display may include image-directing features to provide for the display of information on a surface in at least one individual's view. In the event that a vehicle operator wishes to display information pertinent to the act of travelling, the operator may customize the appearance of the displayed information by moving, adding, deleting, loading, and/or programming custom view layouts.

[0075] Fig. 4 depicts an embodiment of a user-configurable device. In accordance with embodiments of the present disclosure, a device is described that is capable of mimicking the

behavior of other devices based on a received stimulus. Specifically, the device may be the detachable console described above and/or it may be another user device.

[0076] In some embodiments, a user can provide the stimulus to initiate the mimicking process. This stimulus may also be provided electronically, by program, and/or output of another process or device. For example, a stimulus may direct the device to act as an eReader, and the device will reconfigure its display and functionality to behave like an eReader. In addition, the device may be switched from an eReader configuration to a Tablet, a vehicle console, a laptop, an iPad, cellular phone, smart phone, or other device mode. This multi-mode capability can use different operating systems for different device modes. The different operating systems can be effected by techniques, such as virtual machines and partitioning. Another technique is disclosed in U.S. Provisional Application Serial Nos. 61/389,000, filed October 1, 2010, entitled "DUAL DISPLAY WINDOWING SYSTEM"; 61/389,117, filed October 1, 2010, entitled "MULTI-OPERATING SYSTEM PORTABLE DOCKETING DEVICE"; 61/389,087, filed October 1, 2010, entitled "TABLET COMPUTING USER INTERFACE"; 61/507,199; 61/507,203; 61/507,206, which are all incorporated fully herein by this reference in their entirety for all that they teach and for all purposes. Console mode may be selectively enabled or disabled based on vehicle operating mode (e.g., parked, or in gear), GPS and/or location-based positioning (as noted above), and/or contract and/or rule or policy requirements. Providing this level of functionality allows a single device to have multiple personalities. These multiple personalities can be configured to mimic any number of specific devices.

[0077] Fig. 5 depicts a gesture recognition aspect of interfacing with the vehicle ecosystem in accordance with the present disclosure. It is anticipated that the gesture recognition system may include off-screen or off-display gestures (as described in U.S. Provisional Application Serial Nos. 61/389,000, filed October 1, 2010, entitled "DUAL DISPLAY WINDOWING SYSTEM"; 61/389,117, filed October 1, 2010, entitled "MULTI-OPERATING SYSTEM PORTABLE DOCKETING DEVICE"; 61/389,087, filed October 1, 2010, entitled "TABLET COMPUTING USER INTERFACE", the entire contents of which are hereby incorporated fully herein by reference) at a console, dashboard, or other interface. Moreover, the off-screen or off-display gestures may refer to the interpretation of hand, facial, body movements and/or combinations thereof by sensors, cameras, and the like.

[0078] In some embodiments, the vehicle ecosystem may include multiple cameras, sensors, and/or other detection devices to register and interpret at least one individual's movement. A particular body movement, and/or combinations of movements (e.g., hand gestures, and body), may correspond to features that control aspects associated with the vehicle. In accordance with the present disclosure, specific movements may be monitored by the gesture recognition device to provide assistance to a vehicle operator. For example, if at least one individual's facial expression is surprised or alarmed, the gesture recognition device may direct the vehicle to sample data, via sensors and other associated equipment, at a higher rate. If sampling data at "Y" times per second during normal operation, the interpretation of an individual's altered facial expression may direct the system to sample at a rate of "nY" times per second or greater, where "n" is a non-zero scalar value or mathematical function.

[0079] In some embodiments, the gesture recognition system may monitor an operator's eyes and/or head movements to detect drowsy behavior and respond accordingly. In particular, the gesture recognition system could determine if an operator's eyes are closed and initiate an alarm. This alarm may be audible, visual, and/or tactile. The gesture recognition system may start a timer after initiating the alarm to determine, among other things, whether to take emergency action. Additionally, the gesture recognition system may direct the vehicle to safely slow speed, and in some cases stop the vehicle. Other safety measures may be included in this application to provide for a safe emergency situation (e.g., hazard lights may be activated prior to, during, or after slowing and stopping the vehicle). At least one embodiment anticipates that the gesture recognition system may detect repeat events of drowsy and/or erratic behavior of an operator as a more serious condition. Detection of these repeat events may direct the vehicle to safely stop and place a call to emergency services.

[0080] It is an aspect of the present disclosure that the camera and/or sensors may detect head movement to determine a physiological state of one or more individual of a vehicle. For instance, if the gesture recognition system detects that an individual's head has moved from a specific position, or general location, it may indicate that the individual is not in a conscious, or aware, state. Additionally or alternatively, the individual's head may repeatedly move in a manner that suggests the operator is in a poor state of health. In response, the gesture recognition system may direct the vehicle to respond accordingly.

[0081] In some embodiments, the gesture recognition system may include one or more cameras, sensors (e.g., audible, visual, infrared, temperature, vehicle, human wearable, near-human, and the like), and/or other devices (“Detection Devices”), may be configured to register at least one physiological state of one or more operators and/or individuals associated with a vehicle. Upon detecting at least one physiological state, the gesture recognition system may respond at least partially based on the at least one physiological state of the one or more operators and/or individuals. For example, the one or more Detection Devices may register certain input as corresponding to an emergency and/or health condition of the operators and/or individuals of a vehicle.

[0082] In some embodiments, the gesture recognition system may monitor and record one or more input received from the one or more operators and/or individuals. This recorded information may be used to establish a baseline physiological state associated with the one or more operators and/or individuals. In some instances, the one or more operators’ and/or individuals’, temperature, heart-rate, breathing rate, anxiety level, state of awareness, consciousness may be measured with one or more of the various Detection Devices. These devices may include any and all mechanisms designed to take measurements. For instance, a pulse and/or temperature measuring device may be included in the steering wheel of a vehicle. Additionally or alternatively, the vehicle may include infrared cameras and/or sensors to detect at least one temperature of the one or more operators and/or individuals. As can be appreciated, the vehicle seat and/or seats may include sensors to determine movement, weight, and/or shifts of weight on or about the seat. Additionally or alternatively, the seat may include sensor to detect the presence of fluid (e.g., bodily fluids, drinks, oil, acid, and any other fluid) on or about the seat. The seat sensor may even detect one or more of the temperature, viscosity, electrical and mechanical properties of the fluid and may be configured to differentiate between bodily fluids and other fluids present on or about the seat.

[0083] It is anticipated that the gesture recognition system may include at least one audible monitor and/or speech recognition mechanism to receive and/or interpret audible signals from the one or more operators and/or individuals. For example, an operator and/or individual may be breathing heavier than a level established as a baseline associated with that individual, detected by audio microphone (or other device) which may cause a response by the gesture recognition system. Additionally or alternatively, an operator and/or individual may express some oral

statement that indicates a physiological state. For example, the operator and/or individual may state "I am in pain, and I think I am having a heart attack." It is anticipated that a user may establish one or more "code words" to initiate various levels of emergency response. In these instances, the gesture recognition system may compare the statement with one or more statements in memory to determine how to respond. For example, at a first level, a user may make statements like "I am tired" or "I am feeling pain" and in turn, the gesture recognition system may interpret the information and provide one or more location of the nearest accommodations or rest stop. At a second level, the gesture recognition system may direct the vehicle and its controls system to monitor traffic conditions and safely slow and even stop the vehicle. At a third level, the gesture recognition system may direct the vehicle to activate one or more emergency signals, lights, internal alarms, radio output, phone calls, and/or take immediate emergency action. It is anticipated that many levels and/or responses may be configured. In some embodiments, the gesture recognition system may be configured to respond based at least partially on the detected conditions and/or physiological state of the one or more operators and/or individuals. In addition to speech content, some embodiments anticipate using a pitch, tone, and/or volume associated with oral expressions to determine a level of response. For instance, a scream at high-volume may indicate severe pain of one or more operator and/or individual and may even indicate an emergency situation.

[0084] In some embodiments, the gesture recognition system may initiate one or more calls/notifications to at least one third party, police, fire, and/or medical personnel. This call may be used to provide assistance to the one or more operators and/or individuals. It is anticipated that the gesture recognition system may cause GPS, WiFi, and/or Cellular location information to be transmitted to the at least one third party. Additionally or alternatively, the gesture recognition system may cause the physiological state, and even recorded physiological data, to be transmitted to the at least one third party. In some embodiments, the gesture recognition system may cause vehicle information to be transmitted to the at least one third party.

[0085] As previously disclosed, some embodiments anticipate that the gesture recognition system may monitor input received at a steering wheel, or other-human machine interface, to detect a physiological state. For example the gesture recognition system may monitor a steering wheel for movement information. It may be determined by the gesture recognition system that jerky, sudden, and/or exaggerated movements are indicative of physiological state. This

physiological state, or assumption of state, can be determined by the gesture recognition system comparing the monitored movements with baseline data and/or programmed typical movements. Additionally or alternatively, the pressure of grip on the steering wheel may be monitored and determined by the gesture recognition system. In some instances high-pressure may indicate heart failure. In other cases, the detection of no pressure or “no hands” on the wheel may indicate blackout, seizure, and the like.

[0086] In some embodiments, the gesture recognition system may be configured to use one or more of the detection methods disclosed herein to determine a physiological state. For example a seizure may be detected by detecting weight shifts in the seat, no hands on the wheel, and/or slurred speech or oral statement made by one or more operator and/or individual. Among other things, the physiological state may correspond to one or more health level, condition, illness, and emergency.

[0087] It is anticipated that the gesture recognition system may make use of one or more of the aforementioned detection scenarios and/or Detection Devices to personalize vehicle and/or comfort settings for one or more individual of a vehicle. For instance, the temperature sensors and/or infrared sensors may detect that one or more individuals are running cool (e.g., below preset temperatures and/or baseline data collected for the one or more individuals). In response, the gesture recognition system may alter the temperature of the vehicle climate control system for one or more zones of the vehicle. In this case, altering the temperature may be activating an heater for the one or more zones. Additionally or alternatively the temperature sensors and/or infrared sensors may detect that one or more individuals are running hot (e.g., above preset temperatures and/or baseline data collected for the one or more individuals). In response, the gesture recognition system may alter the temperature of the vehicle climate control system for one or more zones of the vehicle. In this case, altering the temperature may be activating an air conditioner for the one or more zones. In some embodiments, the gesture recognition system may make adjustments to comfort setting based on other variables, including but not limited to ambient temperature, outside temperature, forecast temperatures, individual preferences, baseline data, and the like. In one embodiment, the gesture recognition system may recognize at least one individual and modify vehicle and/or comfort settings associated with that individual. In some embodiments, one or more individuals may be recognized based on at least one of the one or more individuals’ weight, temperature, heat signature, height, facial structure, voice, and

combinations thereof. In some embodiments, one or more individuals may be recognized by device and proximity of a device inside, near, adjacent to, or apart from a zone. It is anticipated that a vehicle may comprise one or more zones. In one embodiment, the one or more zones may be inside, adjacent to, or outside a vehicle.

[0088] Applications:

[0089] Referring now to Fig. 6 an embodiment of the present disclosure shows an application store and interface for a vehicle. Similar to application stores and interfaces for smart mobile phones and devices, the present disclosure is directed to an application store (a.k.a., app store) where various vehicular and other applications can be purchased and installed.

[0090] Specifically, the present disclosure is directed to an app store for automotive, and other, applications. In some embodiments a user may visit an app store and download custom designed applications directed to GPS/Location services, Computing (trip computers, car information and status reporting, maintenance, tire pressure and performance monitoring etc.), Graphical User Interface Displays (Customized Control Layouts - designed by industry leaders, Handicapped and Accessibility Interfaces – Larger controls/fonts/voice support), and other applications from a console and/or other device associated with the vehicle.

[0091] It is anticipated that the present disclosure may use a communications channel or multiple channels available to the vehicle to make an application store purchase and download. Moreover, this purchase and download could be effected through the use of at least one individual's phone associated with the vehicle.

[0092] Fig. 7 shows a device sharing an application and/or media with a vehicle console in accordance with an embodiment of the present disclosure. In some embodiments, a protocol for communicating to numerous devices and sharing data is disclosed. Specifically a phone and/or other device may share multiple applications, data, media, and the like that is exchanged through a recognized communication protocol. As can be appreciated by one skilled in the art, the seamless interaction between a vehicle console and a smart phone and/or other device provides greater integration with an individual.

[0093] Referring now to Fig. 8, an in-cloud and pull and/or push connection for vehicle multimedia is shown in accordance with at least one embodiment of the present disclosure. Described is a system directed to pushing information from a smart phone and/or other device to a vehicle console via a cloud-based (personal or service) connection. In particular, the

association between the smart phone and the vehicle enables information from the cloud to be pulled or pushed through the device to the vehicle console. It is anticipated that media may also be pushed from a device to the vehicle console regardless of cloud connection.

[0094] Typically, when music is purchased from iTunes, and/or other service, a device must be authorized or otherwise associated with a specific account in order to play content. This association was originally designed to limit fraudulent activity, but it consequently results in a limited number of devices that an individual may use to access content. An embodiment of the present disclosure is directed to using an already authorized device to push music and other content to a vehicle console or pull music and other content from the server to the console. This “push” type of communication and associated access of content conforms to the original intent of “device authorization,” while also providing convenience to an authorized user to play content without requiring additional and cumbersome “activate – deactivate” steps. In some embodiments, any number of devices may be associated with a vehicle and may push data to the vehicle console.

[0095] Fig. 9 depicts a music streaming application in accordance with embodiments of the present disclosure. Currently, a particular radio may have access to XM, AM, FM, and in some cases “Streaming Audio” capabilities through separate sources. However, it is necessary to change the input on a console to receive the information and music from a specific source.

[0096] It is an aspect of the present disclosure to provide a console capable of compiling and playing music and information by a general and/or specific category. It is anticipated that the console may adaptively select the source providing the content according to specific rules, such as music type. For example, the console may select the strongest signal, or highest quality of channel. Furthermore the data is collected regardless of the source and represented by icons (independent of source) on the console. These icons may be selected by the user to access content. In one configuration, the icon corresponds to a type of music. The music is band and/or communication mode independent. For example, a “classical music” icon indexes and/or links to all classical music channels, whether AM, FM, streaming, XM, etc.

[0097] In some cases, a user may be listening to one station/source while information is being received and cached from another station/source. In the event that the first signal is lost, the cached signal may play. Additionally, the system may adaptively “signal surf,” for a given category, to determine the best channel to receive the highest or best quality signal (e.g., S/N

ratio, stream or radio wave). Moreover, the system may be able to determine that a reception limit is being neared (by pilot signal back or GPS location) and may push delayed broadcast information or other content to a vehicle computer to be cached and listened to after coverage is lost.

[0098] Tracking:

[0099] In general, the present disclosure is directed to using devices, software, and/or systems for tracking at least one vehicle's behavior and analyzing this tracking information to provide data related to a vehicle's user. These data may be accessed by a user, individual, law enforcement agency, insurance company, and/or the vehicle to provide information dependent upon predefined rules.

[0100] Fig. 10 illustrates a vehicle system where the activation of mobile phone and other connected device features is dependent on specific laws in accordance with embodiments of the present disclosure. Currently, drivers and other vehicle operators can use their vehicles while texting, talking, surfing the Internet, streaming video, and generally using their mobile phones in contradiction of local, state, federal, and other laws. In addition, use of certain features may also be limited by specific employment contracts.

[0101] The present invention is directed to an intelligent system that recognizes when a vehicle operator is in motion and deactivates specific features on the mobile device accordingly. Additionally, it is anticipated that the vehicle may reactivate these deactivated features once the vehicle is in a state of rest and/or parked. For instance, the system may use the GPS/location information features alone or in conjunction with vehicle information (speed, parking sensors, transmission setting, etc.) to determine if a vehicle is in motion and may disallow or deactivate use of texting, video streaming, and other applications. Once the vehicle is determined to be in "Park" or otherwise in motion, the applications may be allowed and reactivated.

[0102] These features may be controlled in accordance with local, state, federal, and other laws as well as administrative agency laws and/or employment contracts. Laws can be interpreted by the geographical location of the vehicle. Geographical location may be determined by the device's location-based features, the vehicle's location-based features, a location signal, and/or combinations thereof. The location-based features may include a GPS, WiFi access point, cell tower, and the like.

[0103] Referring now to Fig. 11 an insurance tracking system is shown in accordance with at least one embodiment of the present disclosure. Currently, responsible drivers pay inflated insurance premiums because the insurance industry cannot guaranty a particular driver's adherence to the law or general driving behavior. To address this concern, current insurance companies may allow a driver to install a device in a vehicle to randomly monitor behavior. This device can only monitor certain functions and requires the installation of a device separate from the vehicle's ecosystem.

[0104] The present disclosure is directed to using various data compiled by the system to analyze factors contributing to an individual's driving behavior and/or habits. In the event that an individual wishes to receive better insurance rates for responsible driving, a lower quantity of driving, or other good driving indicators, the driver may agree to provide insurance tracking information. The insurance tracking system may consider GPS and other location-based information (to compare actual speed with speed limit data), g-force sensors (to detect rapid acceleration, hard turns, etc.), perimeter sensors (to detect close-calls, inattention while changing lanes, etc), in order to determine conformance with the good-driving terms established by an insurance company. Because the device may be integrated, and/or associated, with the vehicle's ecosystem total behavioral data may be recorded and sent in real-time to a receiving module. Moreover, the system may detect the user and provide accurate information for each user of a vehicle.

[0105] Fig. 12 shows a law enforcement monitoring system in accordance with embodiments of the present disclosure. Currently, those who break traffic laws are detected by combinations of video surveillance, radar/laser detection, and/or police officers actively monitoring traffic offenses.

[0106] The present disclosure is directed to a system where a police officer and/or rule trap sensor can "ping" an automobile for information relating to its speed and driving conditions. By comparing this received data from the automobile to known data relating to stop signs, speed limits, and the like, a decision can be made on whether the law has been broken. For example, the sensor itself may not necessarily determine the speed of a vehicle. The sensor asks the vehicle to respond to the sensor with the vehicle's speed and possibly other information. Therefore, the speed detection is achieved through responding to a sensor's question and the vehicle's answer. It is anticipated that a specific sensor may use alternate detection methods to

verify the accuracy of a received signal. For instance, if a vehicle is asked to respond with a current speed value, and does so, the sensor may send a radar signal to verify the response. If the response does not match the verification signal, a note is made of the anomaly and the data is recorded. This data may be used by law enforcement to later identify vehicles that are malfunctioning and/or have been compromised.

[0107] As can be appreciated, the applications disclosed herein may be affected by the geographical location and/or movement of a vehicle. In some embodiments, a vehicle may cross a jurisdictional line where different laws exist that concern behavior in or about vehicles. These laws may be stored in a database on-board and/or remotely accessible by the vehicle. A vehicle may use its location-based features to determine the appropriate applicable laws and enable or disable certain features to a user. For example, in the event that an individual crosses a state line where the local laws prohibit texting while driving, the vehicle may disable texting for the vehicle operator. This blocking would not prevent others in a vehicle from texting, and if allowed may provide for the operator to continue to send voice-activated texts, etc. Movement and location of the vehicle may be determined using location-based features as described herein. Moreover, to prevent false blocking of features, a specific user device position may be determined by sensors on the device, sensors in the vehicle, and/or combinations thereof. Although described with reference to blocking the texting ability of a specific user, it can be appreciated that the ability to surf the Internet, view photos, access streaming content, and other predetermined distractions may also be disabled.

[0108] Fig. 13 depicts an etiquette suggestion application in accordance with embodiments of the present disclosure. It is an aspect of the present disclosure to provide a system that is capable of analyzing all available information related to driving and vehicular operation etiquette and makes suggestions based on the outcome of the data analysis.

[0109] In some embodiments, if the vehicle is blocking faster traffic in the fast lane, the system may suggest to carefully change lanes. Additionally, if the user is known to not use turn signals, the system may remind a user during, after, and/or before a turn to use the signal. The system may also detect fast approaching vehicles and suggest changing lanes, increasing speed, etc. Data relating to driving behavior may be recorded at times and stored for use with this etiquette suggestion system.

[0110] Location-Based Communications:

[0111] The present disclosure is directed to vehicles that may make use of a plurality of sensors to achieve various functions. These sensors may make use of GPS, WiFi access points, cell towers, gyroscopes, accelerometers, RF, radar, light, temperature, pressure, sonic, ultrasonic, and the like to determine a number of conditions. It is anticipated that these sensors may exist as part of the vehicle, be attached to the vehicle, and/or be associated with a device separate from the vehicle. In some instances the sensors included with mobile devices that are associated with a vehicle may be used to provide information to the vehicle ecosystem.

[0112] Fig. 14 depicts a parking space finder in accordance with embodiments of the present disclosure. In some embodiments, parking meters may use a series of sensors to determine whether a spot associated with a meter is vacant or occupied. This data can be retrieved by certain phones and/or other devices and may be interpreted by a user to find open spots. Additionally, this data may be interpreted by at least one system associated with a vehicle. It is anticipated that one embodiment of the present invention is directed to reserving parking spaces through the service.

[0113] In some embodiments, parking lots and/or spaces may use a plurality of sensors to provide occupancy information. These sensors may include pavement sensors, solar, weight, magnetic, video, and other sensing elements to sense a vehicle's presence and/or lack thereof.

[0114] Referring to Fig. 15, a parking meter status application and associated devices are provided in accordance with embodiments of the present disclosure. In some embodiments, a parking meter may provide status information to a device when a device is "introduced," such as by a handshake, to the meter. Introduction of a device can be established via NFC, the Internet, text message, credit account association, Bluetooth, and/or other communication protocol. The user of a device may elect to receive alerts based on certain conditions. In some embodiments, these alerts may be automatically provided to the introduced device. The device and/or meter may be programmed to terminate communication upon some stimulus and/or a predefined condition.

[0115] It is a further aspect of the present disclosure to allow a user to a specific parking meter association and elect to receive alerts, pay the meter via cell phone and/or credit transaction, and monitor the status of the meter. A typical alert may be sent to a smart phone and/or other device to read as follows "Your meter will expire in X minutes." It is also anticipated that tickets may be automatically written and sent to the home address of the user who "introduced" the phone to

the meter. Furthermore, once a device has been introduced to a meter, the meter may respond to the phone with various information relating to the meter, parking time allowed, costs, ticket cost for nonpayment, and the like. The current meter display itself may be provided to the user's communication device. The parking meter itself may post its current status on the Internet or broadcast it to nearby vehicles to inform them that it is expired and potentially corresponds to an available parking space.

[0116] Fig. 16 depicts an object sensing system in accordance with embodiments of the present disclosure. The present disclosure describes a communication between a vehicle and a pedestrian, cyclist, and/or other vehicle user to determine presence. This communication may be based on information beyond vehicle proximity sensing. For example, a phone may use its location-based information and/or associated sensors to determine position and at least one travel vector. The phone may send a ping message asking if there is anyone adjacent to the vehicle. In response, nearby phones, devices, and/or vehicles may respond with a presence indication. It is anticipated that the vehicle could also send this ping message. In some embodiments, the presence indication may include, but is not limited to, information such as a device's location, travel vector, distance to response device, and device type.

[0117] Fig. 17 depicts a proximity warning system to determine and alert the presence of adjacent vehicles in accordance with embodiments of the present disclosure. In particular, the present disclosure allows a vehicle to communicate with vehicles in a determined proximity of the vehicle. Specifically, a vehicle may provide information to adjacent vehicles and can "daisy-chain" back to a given user to transmit general traffic information back up the chain. In one embodiment, each vehicle is a node in a network of vehicles. This network of vehicles may be self-configurable and self-healing. In other words, there is no central point of intelligence required because the nodes are distributed among different vehicles. It is anticipated that each vehicle only needs to know the information from surrounding and/or adjacent vehicles.

[0118] As can be appreciated, data relating to the presence of a vehicle may be obtained from a number of different systems in a number of different ways. For example, the system may use timed radio waves, poll various GPS units and information and perform calculations, of speed, location, direction, collision/safe stop, airbag status, to relay valuable information throughout the daisy-chain. As a further example, if at least one vehicle is traveling in the wrong direction, against the usual flow of traffic, other vehicles may be alerted by receiving information from the

at least one vehicle travelling in the wrong direction. In addition, information gleaned from the response and actions of other vehicles may be relayed to each vehicle. Therefore, if other vehicles are slowing, pulling-over, and even stopping, adjacent vehicles are alerted of these actions.

[0119] Fig. 18 illustrates a sensing method where elements and usage may be controlled based on environmental factors in accordance with embodiments of the present disclosure.

Specifically, an aspect of the present disclosure is directed to the control of vehicles sensors to conserve energy usage and data transfer based on multiple factors. In one embodiment, it is anticipated that certain sensors do not need to continually operate at times of the day and/or days where traffic is minimal. For example, the system may observe that traffic is extremely light in a given area, and/or because the car is in motion at a time of the day (e.g., 2:00 am) certain sensors may be controlled to sense, or sample, less frequently. It is further anticipated that certain sensors may be deactivated completely depending on the conditions. Factors contributing to this intelligent energy-saving feature may be based on sensed vehicle access, time of day, traffic info from a GPS service, reported conditions from other users, and the like.

[0120] In accordance with embodiments of the present disclosure, data obtained from the use of these sensors may be applied to map updates. Specifically, sensors may be directed to relay specific information during nonpeak times. This information may include map comparisons relating to road position, lane number, and size. It is anticipated that all of this data may be compiled with a combination of vehicle sensors. Additionally, sensors on lane dividers, signs, and other markings may communicate with a vehicle to provide more information relating to map, and other, data.

[0121] Fig. 19 shows a system that may be used to determine an accurate location of a vehicle in accordance with embodiments of the present disclosure. Currently, a smart phone may be used to record information relating to a parked vehicle. However, this information is typically input by a user and resides with a phone. It has not been disclosed heretofore that a vehicle provides information relating to its specific position using data in addition to that provided a GPS unit.

[0122] It is an aspect of one embodiment of the present disclosure that a vehicle may use multiple sensors to determine its current location and relay that position to a smart phone and/or other device. Specifically, in addition to providing GPS or other location information (via cell

towers, and/or WiFi access points, etc.) the vehicle may use temperature sensors, altitude sensors, barometric pressure sensors and the like to determine whether the vehicle is located in or near an underground structure, under a tree, or other landmark. An exemplary use of such a system may have application when parking a car at an airport or shopping area. If the vehicle is parked underground in the summer, the surrounding temperature may be cooler than ambient temperatures. This comparison may be made by comparing data obtained from vehicle sensors with data obtained regarding the local ambient temperature.

[0123] Hardware:

[0124] Referring now to Fig. 20 a universal bus is described in context of a vehicle communication system in accordance with embodiments of the present disclosure. The universal bus may have wired and wireless aspects that enable communication with multiple devices. Currently, a single user may pair a (smart) phone or other device with a vehicle via Bluetooth. Unfortunately, in the case of a vehicle that is enabled to share information between individuals through the interface of a vehicle console or other display it would be advantageous to connect more than one device via Bluetooth or other connection protocol.

[0125] In one embodiment the universal bus is directed to a protocol and procedure whereby a plurality of phones and/or devices can connect to the console and vehicle system via Bluetooth or other protocol. For example, if a user wishes to use the speakerphone capabilities of an automobile, the universal bus will allow multiple users to connect to the Bluetooth (or other connection protocol) connection and provide for functionality to a plurality of users. In addition to sharing functions associated with the automobile, the users may exchange information along the same universal bus.

[0126] In another embodiment, the universal bus may include hard-wired connections. These connections can be used in a similar manner to enable communications between multiple devices and a vehicle console and/or system. It is anticipated that the universal bus, in any embodiment, may allow for the sharing of data, media, and functionality of devices.

[0127] Fig. 21 depicts a mobile network of a vehicle in accordance with embodiments of the present disclosure. Currently, some vehicles provide for the ability to create one or more mobile hot spots. These hot spots allow individual users to connect to the Internet with a device of their own. However, these hot spots rely on the Internet to connect users and as such do not provide a network for individuals to communicate in the event of no Internet connectivity.

[0128] In some embodiments the present disclosure is directed to an internal automobile network created specifically created for users associated with a vehicle. It is anticipated that the network is not necessarily required to connect to the Internet. However, once an individual associates a device with the vehicle, the vehicle may create a local area network for associated devices. It is anticipated that devices can be selectively associated and disassociated through the vehicle and/or its console. Moreover, association with a specific device may be provided on a temporary and/or permanent basis. If temporary, the device association may timeout after a predetermined time period has passed.

[0129] Fig. 22 depicts a universal console chassis in accordance with embodiments of the present disclosure. In some embodiments, a console chassis is provided that is capable of receiving different inserts to provide functionality to the overall system. It is anticipated that the chassis may include a basic frame, rack slots, and common connection points. The frame may reside behind the console display or elsewhere in a vehicle. The rack slots may be sized to accommodate one or more inserts. In another embodiment, an insert may take up one or more rack slots. The connection points may include at least one locking feature, and an insert release feature. Additionally, the connection point may also include a standardized electrical and/or mechanical connection interface.

[0130] For example, a vehicle may not be originally specified with a GPS and/or location-based services, but a GPS/Location Services unit may be added to the console. Inserting a unit may be similar to inserting a blade into a server rack. The universal console chassis may be designed to hold any number of units that can be easily removed and reconfigured by plugging into the one or more rack slots that is part of the framework of the universal console.

[0131] Location-Based Communications:

[0132] Fig. 23 depicts a central repository for vehicle information in accordance with embodiments of the present disclosure. Currently, car drivers have the option to sign up for a service like General Motors OnStar® to remotely unlock cars, and provide other features such as remote start, tracking vehicles, and/or locking cars, etc.

[0133] In some embodiments, the present disclosure is directed to a central repository that can be used in conjunction with an individual vehicle. The central repository may be stored on-board the vehicle and/or remotely. In the event that the central repository is stored remotely, it may be supervised by a law enforcement agency, or secure administrative agency. It is anticipated that

strong security procedures may be employed to avoid hacker attacks, especially if stored at a remote central repository like the Department of Motor Vehicles (DMV), or other security-approved location. In the event that a vehicle is stolen, the true owner of a vehicle may prove ownership to the central repository and locate, lock, shutdown, etc. the vehicle.

[0134] In another embodiment, a police device may communicate to another vehicle to slowly reduce that vehicle's speed, shutdown the engine, cut power, etc. The communication can be securely effected using unique codes or other cryptographic techniques. Moreover, the communication may be through a server associated with a central repository. It is anticipated that the module controlling these functions is securely guarded and designed to prevent hacking attempts.

[0135] Fig. 24 depicts a real-time traffic system in accordance with embodiments of the present disclosure. Currently, vehicle operators, can receive general traffic information from a service like XM or Sirius radio. This service provides traffic information received and relayed from static monitors to an XM or Sirius device installed in an automobiles.

[0136] It is an aspect of the present disclosure to provide a central database (such as XM or Sirius traffic) with traffic information obtained from vehicles and associated devices. This information may then be relayed to vehicles in real-time. Data obtained from the operation of a vehicle may be used in determining traffic conditions (signal breaking, speed, etc.). Specifically, the daisy-chain network and sensors previously described can provide information to be used in interpreting the real-time traffic conditions. For example, several vehicles slowing to a stop could indicate an accident or emergency that could be relayed to the public. The real-time traffic system would then correlate the information and provide the collected and correlated traffic information to the public, such as by a broadcast or push or pull signaling mechanism.

[0137] Additionally, the availability of this data may be limited to dissemination to a select few. For example, those who contribute data relating to traffic may be those who can receive information relating to overall traffic conditions. Otherwise, the signal may be blocked to others, those who do not activate feature, and/or participate in the information collection, etc.

[0138] Fig. 25 depicts a system where map data is updated from vehicles and associated devices according to embodiments of the present disclosure. Currently, map data and directions may be provided to a vehicle by GPS units, map disks, or a GPS service. However, the data can become old and incorrect as time passes.

[0139] In accordance with the present disclosure, a system where map data is updated based on information provided by other users and vehicles is provided. Specifically, the system may get updates on mapped areas by receiving information provided by a plurality of devices.

Additionally, the system may make corrections to map data providing accurate data over time.

[0140] In some embodiments, the automobile may track where you are currently located. If the GPS unit provides specific directions to a vehicle and an individual takes a route that does not follow the directions provided, the area may be flagged for further investigation. The area would be flagged because failure to adhere to provided directions may indicate inaccurate directions and/or changed conditions. The flagged areas may then be compared to other users' behavior and travel patterns. This data may also be collected relating to other settings, including parking lots, store front locations, etc.

[0141] Furthermore, the map updating function may suggest alternate routes in addition to or alternatively to standard map routes. These alternate routes may be generated by: 1) the GPS unit, 2) past driver data, 3) compilation of data from other users/drivers, and 4) combinations thereof. These routes may also be coded according to the route suggestion type and source. For example, your current location, or source, is X, and you want to get to destination, Y; different routes are provided using a combination of GPS location and other data coded in alternate colors/numbers/or other identifiers.

[0142] It is an aspect of one embodiment of the present disclosure, to also measure standard travel times for routes and store them against specific days and times. If a vehicle travels to a location (e.g., work) at a specific time every day, it can determine traffic patterns, stoppage at traffic lights and stop signs, and the like. This data can be aggregated with multiple users' devices and vehicles to get and project more realistic arrival times and routes. Standard GPS units and services with "real-time" traffic cannot perform this function well. Using dates in the compilation of traffic data and predicted times is important because a specific date may provide a better prediction of traffic conditions. By cross-referencing a particular date against popular holiday and/or vacation months traffic conditions may be more accurately predicted. Further, the system may use the sensors associated with the vehicle to determine estimated traffic times based on current weather and/or road conditions. Alternatively, the weather conditions may be obtained by connecting to a source providing data from weather stations and sensors remote from the vehicle.

[0143] It is anticipated that a device associated with a vehicle may receive text alerts on the best time to leave, based on real-time traffic conditions and predictions. In one embodiment, the predicted traffic for at least one future time period may be provided to a device at a certain time. For example, a user with a device associated with a vehicle may receive an alert the night and/or day before traveling to provide traffic predictions by the hour, minute, or any fraction thereof. Additionally, a user may desire to receive an alert listing predicted traffic times for a given future time period. In one application, a user may receive a prediction schedule for the week ahead before venturing into traffic.

[0144] Fig. 26 depicts a vehicle ecosystem capable of providing accurate indications for purposes of service and maintenance in accordance with embodiments of the present disclosure. Currently, vehicles may offer a warning light and/or series of lights to provide information to a user regarding vehicle condition. These lights may have a multitude of meanings that may require further inspection by a mechanic or other qualified individual. In order to interpret and decode the meanings behind a light combination, the user is routinely required to consult the owner's manual, the Internet, or to call the dealer. In some cases, these lights are only maintenance reminders and need not be immediately addressed. However, in other cases, the lights are urgent and require immediate attention.

[0145] It is an aspect of one embodiment of the present disclosure to provide an Internet enabled car that is capable of transmitting vehicle codes, error code readings, and to remotely diagnose and display these codes to a user and/or a mechanic. This diagnostic information may be performed on-board or remotely. It is anticipated that the information may be accessed according to chosen preferences. Additionally, it is anticipated that based on the type of warning/error code, the system may suggest a recommended course of action. For example, if the error code indicates a severe or catastrophic failure the system may suggest to pull-over, stop the car, and proceed to a safe area away from the automobile.

[0146] In some embodiments, the system may provide "conversational" warnings to a user. These warnings and associated codes may also be simultaneously transmitted to a selected garage and/or postponed for approval to transmit to the nearest garage (either wired or wirelessly). In addition, the system may estimate an approximate time to fix (based on past garage fix times, garage inventory, severity of problem, combinations, etc.) and make appropriate suggestions. For example, the system may provide the conversational warning

“Please do not be alarmed, your engine is running slightly low on oil; there are four garages in the general area. You have time to get a cup of coffee while you wait; here are three coffee shops in the immediate location” and/or “It appears that the rear left suspension is malfunctioning and the upper strut will need to be replaced. It is noticed that you are greater than 80 miles from home, would you like to book a reservation at a local hotel? There are five hotels in the area rated three stars or above.”

[0147] Fig. 27 depicts a vehicle ecosystem capable of exchanging information with public records databases for the purposes of general awareness in accordance with embodiments of the present disclosure. Currently, sexual predators and other offenders must register with a “sexual predator database” or other database to alert the public of their home location. However, there is nothing that continually tracks a sexual predator or alerts others if a sexual predator is nearby in his/her car.

[0148] It is an aspect of one embodiment of the present disclosure that a system is capable of connecting to a sexual predator, and/or other, database and using patterns to determine predator whereabouts. Using information relating to a home position of a sexual predator and comparing that position to a given automobile’s repeated park position, the system may make a connection between a predator and a given vehicle. In the event that a vehicle is parked near a predator’s home location, recorded in the sexual predator database, the vehicle may associate itself with belonging to the sexual predator. Others may then be warned of the sexual predator’s location depending on the location of the associated vehicle.

[0149] Another embodiment anticipates using an additional check to verify that the predator’s home is truly associated with the appropriate vehicle. For example, if the sexual predator lives in an apartment building with multiple parking spaces, extra data points may be used to not falsely associate cars with sexual predators. In this instance, the system may record whether the automobile has parked near a known sexual predator’s work location as an extra factor to add to the accuracy of identifying the true sexual predator. Additionally, the vehicle ecosystem may make an assumed association and attempt to verify the information before making the information public by sending a verification request to a sexual predator registry and ask if the sexual predator is actually associated with the vehicle. Although described as relating to sexual predators, it can be appreciated by one skilled in the art that the application may also apply to

other known criminals, violent offenders, and other individuals who may be found in public record databases.

[0150] Additional Embodiments:

[0151] In accordance with embodiments of the present disclosure a driving reputation system is further disclosed. As a vehicle collects information from associated sensors and devices, data may be stored and related to a specific driver. This related data may correspond to a driving reputation. For instance, a vehicle operator may obtain a lower reputation if that vehicle operator is known to drive erratically, make sudden stops, avoid using signals, and/or constantly speed through school zones, and the like.

[0152] It is anticipated that reputation data may be compiled by the vehicle and/or associated systems. Alternatively, or additionally, vehicle operators may report on least one driver's behavior by sending a signal to a central repository. This central repository may analyze the reported data and cause at least one driver's behavior to be reflected in a reputation "grade." In some embodiments, vehicle operators may report good, bad, and/or both types of behavior. For example, if a driver yields to another driver, waives thank you, and/or provides another driver space to enter into a lane, the other driver may report good behavior about the driver. In addition to communicating reputation to a repository, it is anticipated that one vehicle may communicate with another to report and/or exchange information regarding vehicle operation reputation.

[0153] The Attachments

[0154] The above features of this disclosure and additional features and improvements to the disclosed features are discussed in the following attachments:

[0155] Exhibit "A" (4 pages);

[0156] Exhibit "B" (31 pages); and

[0157] Exhibit "C" (9 pages).

[0158] The exemplary systems and methods of this disclosure have been described in relation to an ecosystem for a vehicle. However, to avoid unnecessarily obscuring the present disclosure, the preceding description omits a number of known structures and devices. This omission is not to be construed as a limitation of the scopes of the claims. Specific details are set forth to provide an understanding of the present disclosure. It should however be appreciated that the present disclosure may be practiced in a variety of ways beyond the specific detail set forth herein

[0159] Furthermore, while the exemplary aspects, embodiments, and/or configurations illustrated herein show the various components of the system collocated, certain components of the system can be located remotely, at distant portions of a distributed network, such as a LAN and/or the Internet, or within a dedicated system. Thus, it should be appreciated, that the components of the system can be combined in to one or more devices, such as a Personal Computer (PC), laptop, netbook, smart phone, Personal Digital Assistant (PDA), tablet, etc., or collocated on a particular node of a distributed network, such as an analog and/or digital telecommunications network, a packet-switch network, or a circuit-switched network. It will be appreciated from the preceding description, and for reasons of computational efficiency, that the components of the system can be arranged at any location within a distributed network of components without affecting the operation of the system. For example, the various components can be located in a switch such as a PBX and media server, gateway, in one or more communications devices, at one or more users' premises, or some combination thereof. Similarly, one or more functional portions of the system could be distributed between a telecommunications device(s) and an associated computing device.

[0160] Furthermore, it should be appreciated that the various links connecting the elements can be wired or wireless links, or any combination thereof, or any other known or later developed element(s) that is capable of supplying and/or communicating data to and from the connected elements. These wired or wireless links can also be secure links and may be capable of communicating encrypted information. Transmission media used as links, for example, can be any suitable carrier for electrical signals, including coaxial cables, copper wire and fiber optics, and may take the form of acoustic or light waves, such as those generated during radio-wave and infra-red data communications.

[0161] Also, while the flowcharts have been discussed and illustrated in relation to a particular sequence of events, it should be appreciated that changes, additions, and omissions to this sequence can occur without materially affecting the operation of the disclosed embodiments, configuration, and aspects.

[0162] A number of variations and modifications of the disclosure can be used. It would be possible to provide for some features of the disclosure without providing others.

[0163] In some embodiments, the systems and methods of this disclosure can be implemented in conjunction with a special purpose computer, a programmed microprocessor or

microcontroller and peripheral integrated circuit element(s), an ASIC or other integrated circuit, a digital signal processor, a hard-wired electronic or logic circuit such as discrete element circuit, a programmable logic device or gate array such as PLD, PLA, FPGA, PAL, special purpose computer, any comparable means, or the like. In general, any device(s) or means capable of implementing the methodology illustrated herein can be used to implement the various aspects of this disclosure. Exemplary hardware that can be used for the disclosed embodiments, configurations and aspects includes computers, handheld devices, telephones (e.g., cellular, Internet enabled, digital, analog, hybrids, and others), and other hardware known in the art. Some of these devices include processors (e.g., a single or multiple microprocessors), memory, nonvolatile storage, input devices, and output devices. Furthermore, alternative software implementations including, but not limited to, distributed processing or component/object distributed processing, parallel processing, or virtual machine processing can also be constructed to implement the methods described herein.

[0164] In yet another embodiment, the disclosed methods may be readily implemented in conjunction with software using object or object-oriented software development environments that provide portable source code that can be used on a variety of computer or workstation platforms. Alternatively, the disclosed system may be implemented partially or fully in hardware using standard logic circuits or VLSI design. Whether software or hardware is used to implement the systems in accordance with this disclosure is dependent on the speed and/or efficiency requirements of the system, the particular function, and the particular software or hardware systems or microprocessor or microcomputer systems being utilized.

[0165] In yet another embodiment, the disclosed methods may be partially implemented in software that can be stored on a storage medium, executed on programmed general-purpose computer with the cooperation of a controller and memory, a special purpose computer, a microprocessor, or the like. In these instances, the systems and methods of this disclosure can be implemented as program embedded on personal computer such as an applet, JAVA® or CGI script, as a resource residing on a server or computer workstation, as a routine embedded in a dedicated measurement system, system component, or the like. The system can also be implemented by physically incorporating the system and/or method into a software and/or hardware system.

[0166] Although the present disclosure describes components and functions implemented in the aspects, embodiments, and/or configurations with reference to particular standards and protocols, the aspects, embodiments, and/or configurations are not limited to such standards and protocols. Other similar standards and protocols not mentioned herein are in existence and are considered to be included in the present disclosure. Moreover, the standards and protocols mentioned herein and other similar standards and protocols not mentioned herein are periodically superseded by faster or more effective equivalents having essentially the same functions. Such replacement standards and protocols having the same functions are considered equivalents included in the present disclosure.

[0167] The present disclosure, in various aspects, embodiments, and/or configurations, includes components, methods, processes, systems and/or apparatus substantially as depicted and described herein, including various aspects, embodiments, configurations embodiments, subcombinations, and/or subsets thereof. Those of skill in the art will understand how to make and use the disclosed aspects, embodiments, and/or configurations after understanding the present disclosure. The present disclosure, in various aspects, embodiments, and/or configurations, includes providing devices and processes in the absence of items not depicted and/or described herein or in various aspects, embodiments, and/or configurations hereof, including in the absence of such items as may have been used in previous devices or processes, e.g., for improving performance, achieving ease and/or reducing cost of implementation.

[0168] The foregoing discussion has been presented for purposes of illustration and description. The foregoing is not intended to limit the disclosure to the form or forms disclosed herein. In the foregoing Detailed Description for example, various features of the disclosure are grouped together in one or more aspects, embodiments, and/or configurations for the purpose of streamlining the disclosure. The features of the aspects, embodiments, and/or configurations of the disclosure may be combined in alternate aspects, embodiments, and/or configurations other than those discussed above. This method of disclosure is not to be interpreted as reflecting an intention that the claims require more features than are expressly recited in each claim. Rather, as the following claims reflect, inventive aspects lie in less than all features of a single foregoing disclosed aspect, embodiment, and/or configuration. Thus, the following claims are hereby incorporated into this Detailed Description, with each claim standing on its own as a separate preferred embodiment of the disclosure.

[0169] Moreover, though the description has included description of one or more aspects, embodiments, and/or configurations and certain variations and modifications, other variations, combinations, and modifications are within the scope of the disclosure, e.g., as may be within the skill and knowledge of those in the art, after understanding the present disclosure. It is intended to obtain rights which include alternative aspects, embodiments, and/or configurations to the extent permitted, including alternate, interchangeable and/or equivalent structures, functions, ranges or steps to those claimed, whether or not such alternate, interchangeable and/or equivalent structures, functions, ranges or steps are disclosed herein, and without intending to publicly dedicate any patentable subject matter.

ABSTRACT

Methods and systems for a complete vehicle ecosystem are provided. Specifically, systems that when taken alone, or together, provide an individual or group of individuals with an intuitive and comfortable vehicular environment. The present disclosure builds on integrating existing technology with new devices, methods, and systems to provide a complete vehicle ecosystem.

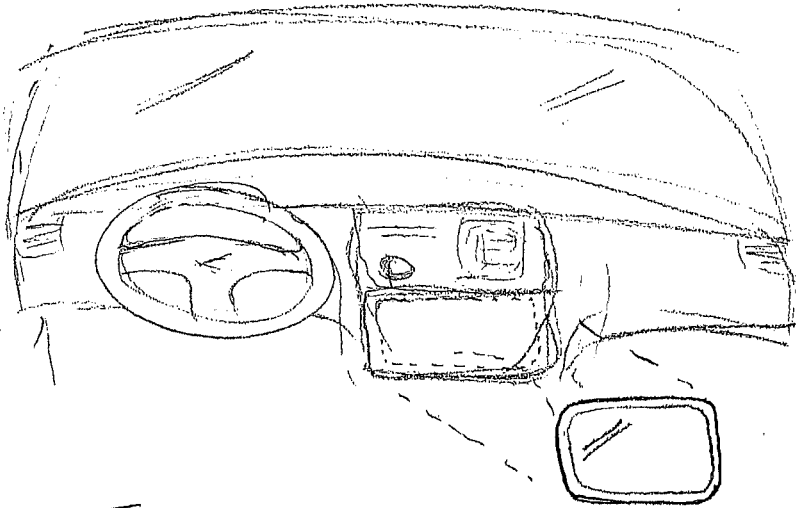


FIG. 1A

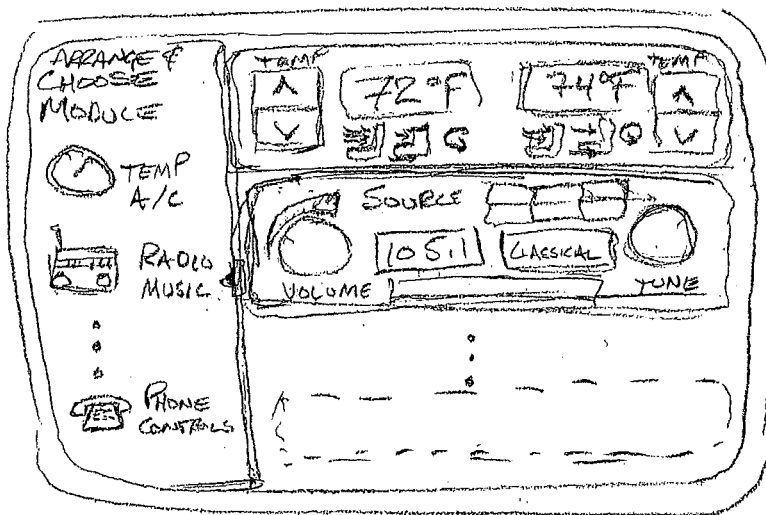


FIG. 1B

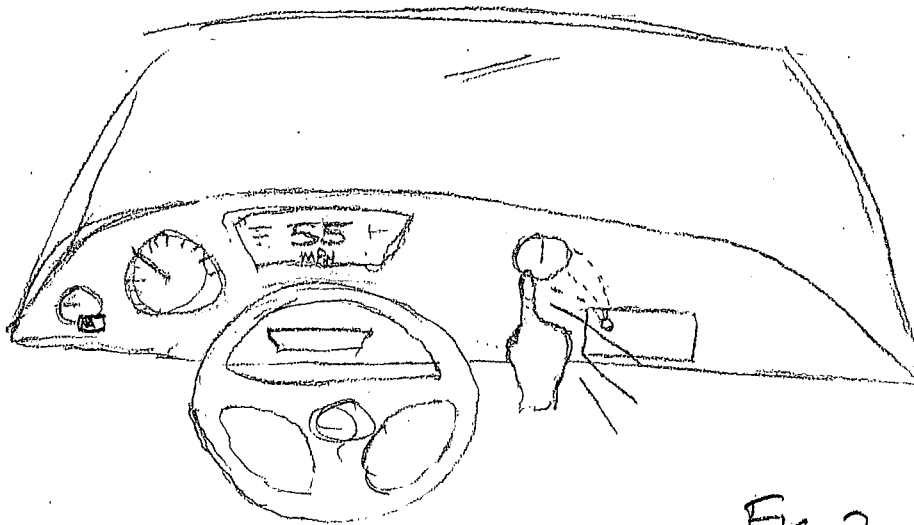


FIG. 2.

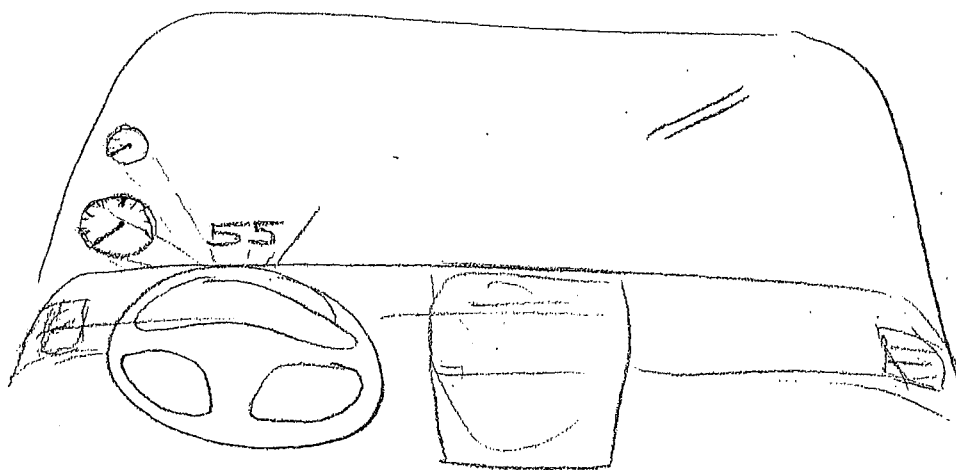


FIG. 3

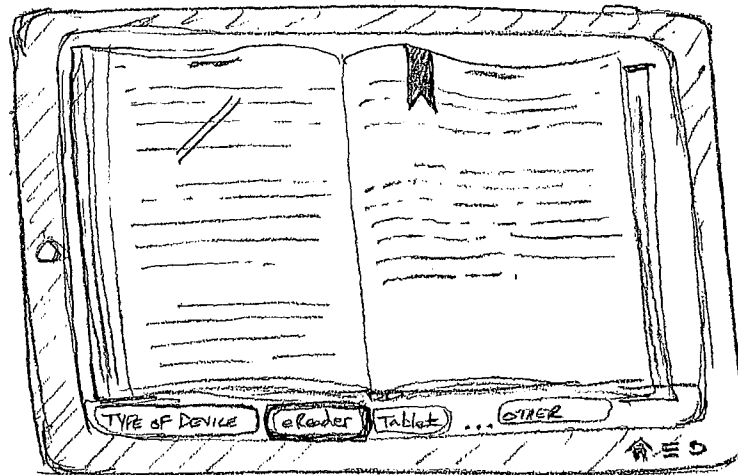


FIG. 4

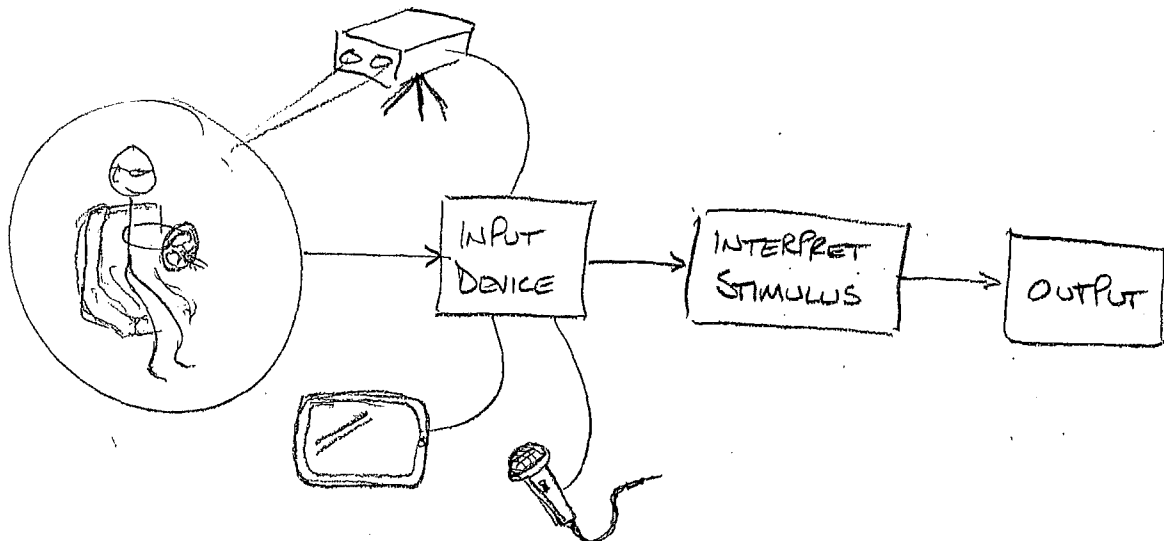


FIG. 5

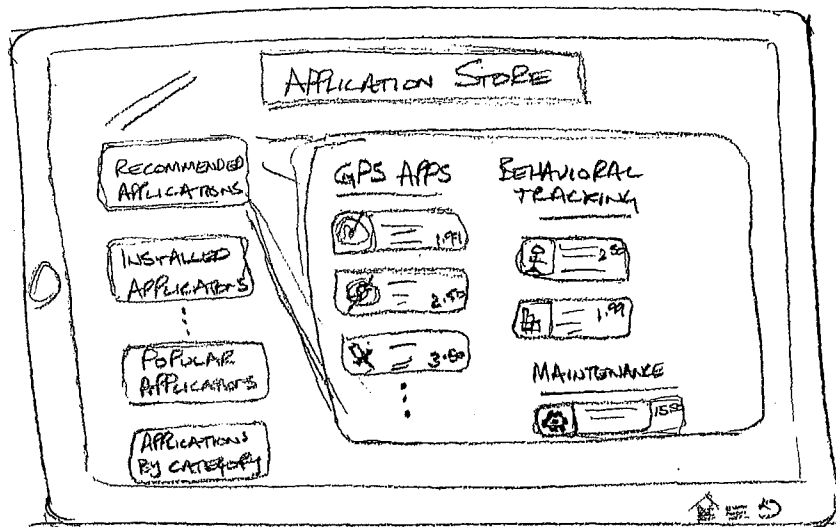


Fig. 6

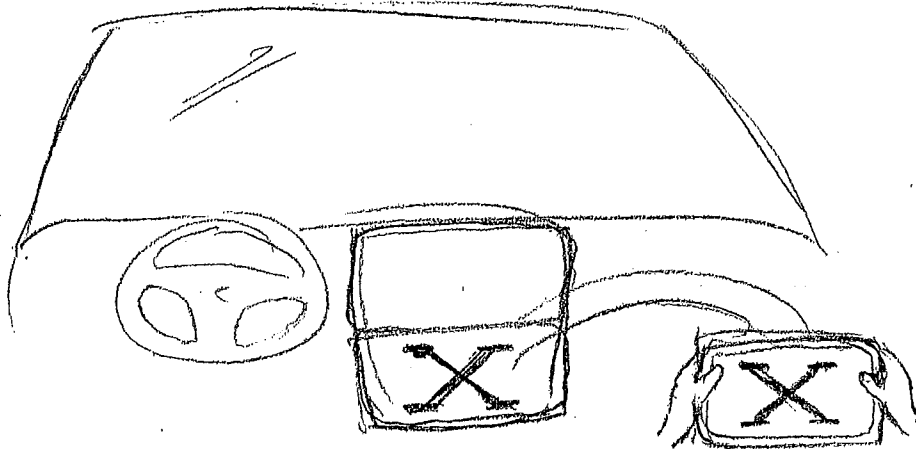


Fig. 7

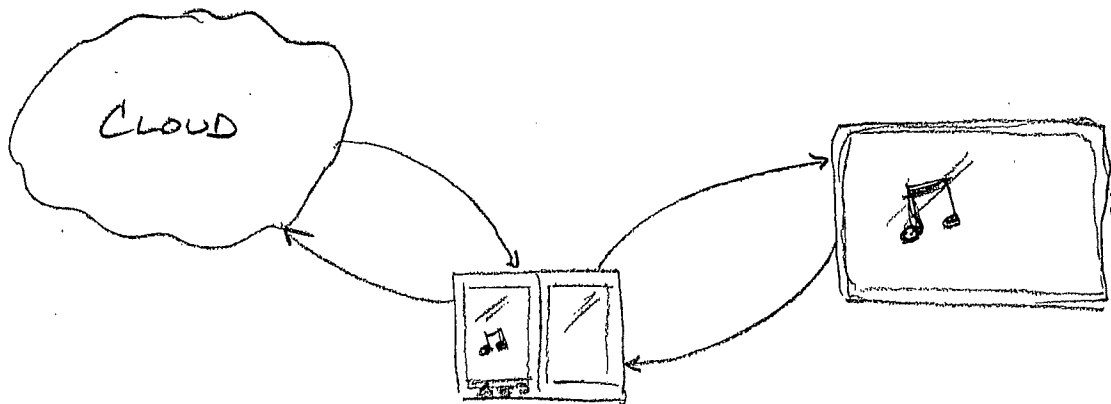


Fig. 8

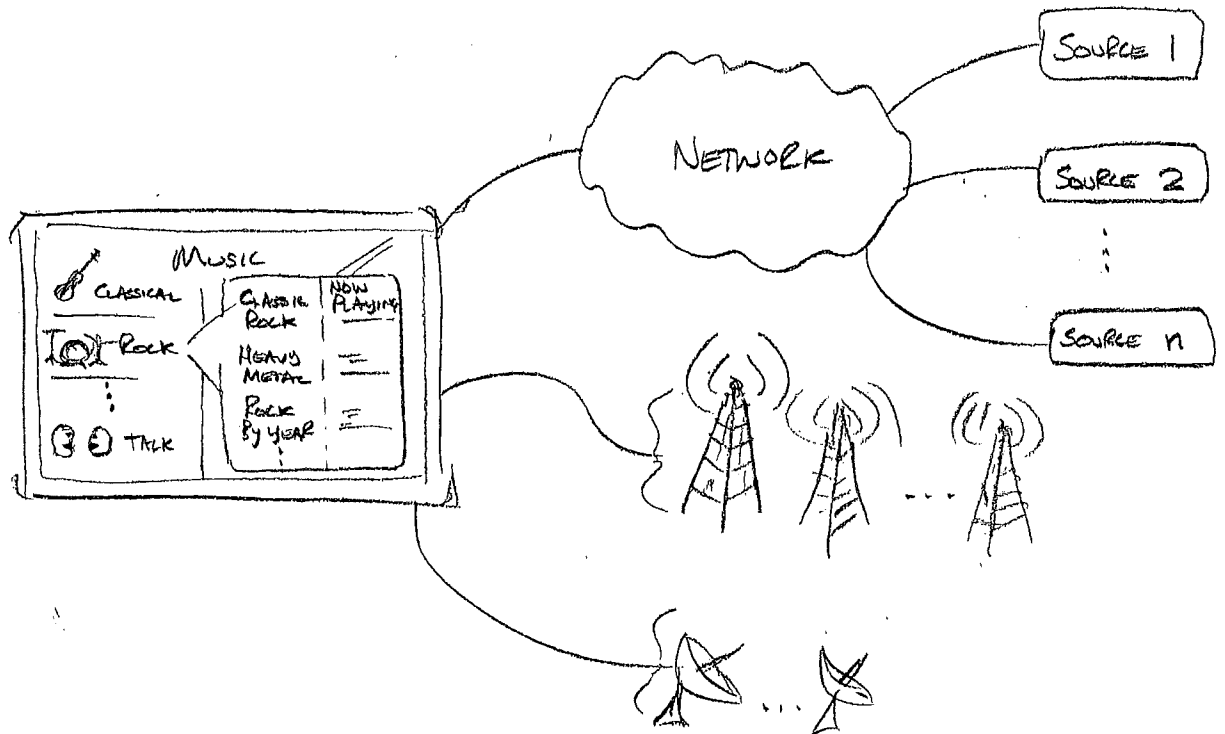


Fig. 9

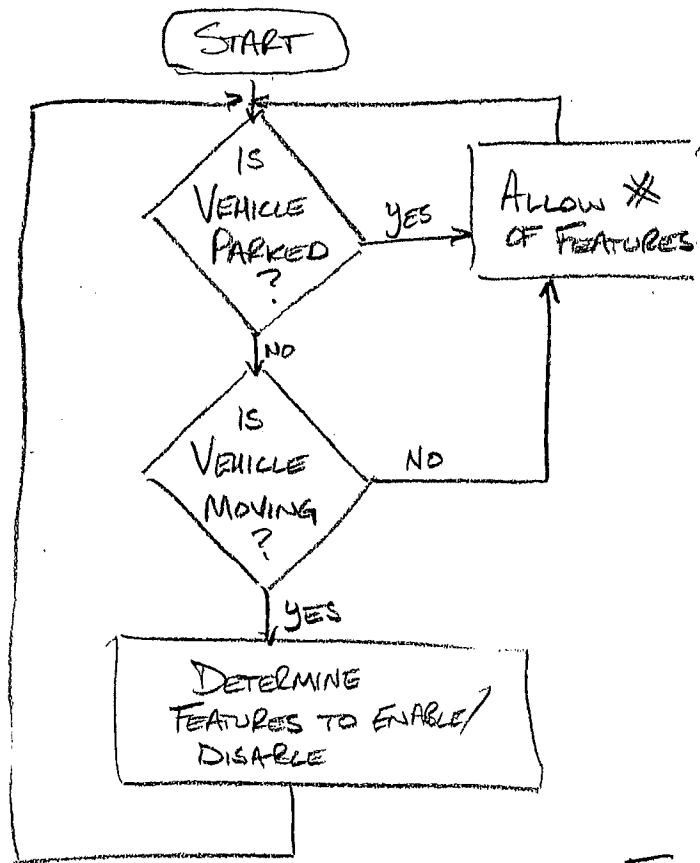


FIG. 10

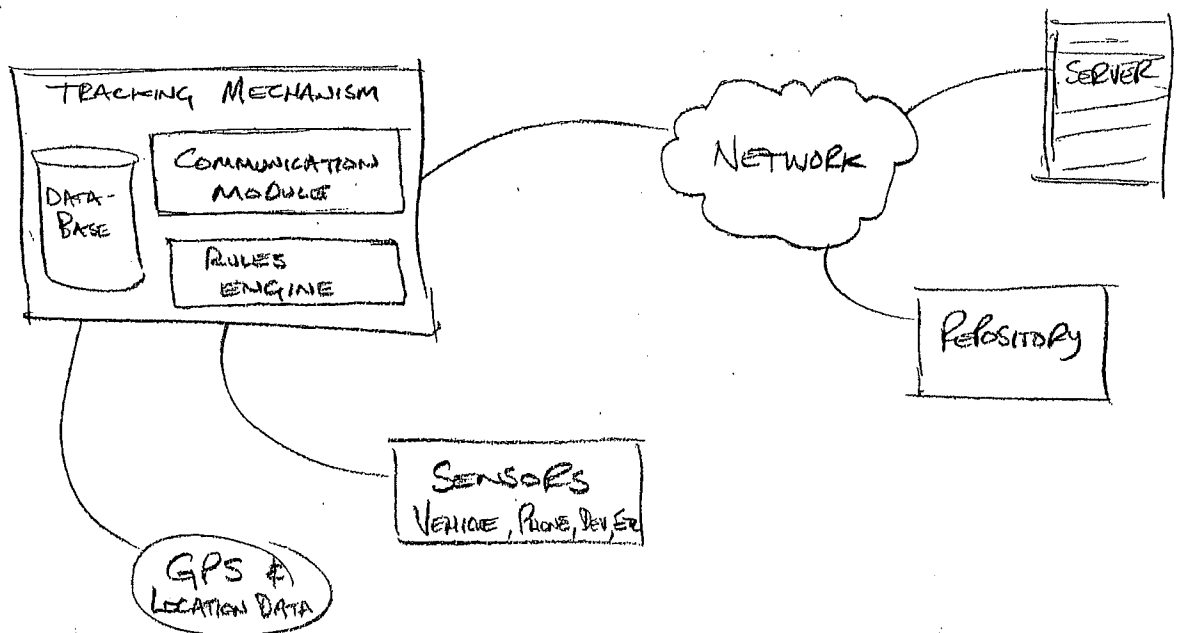


FIG. 11

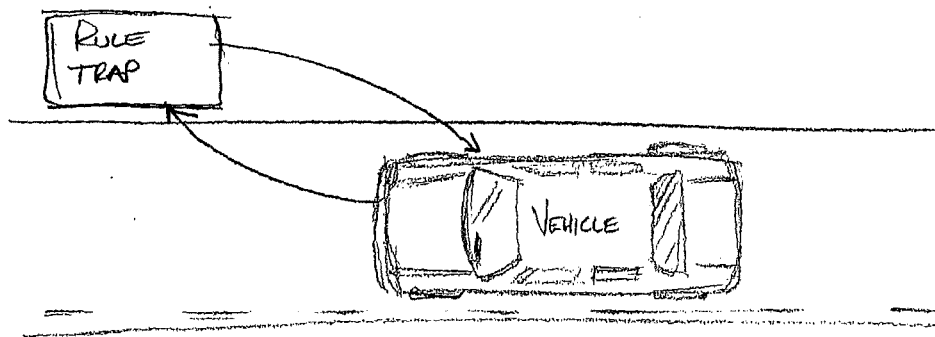


FIG. 12

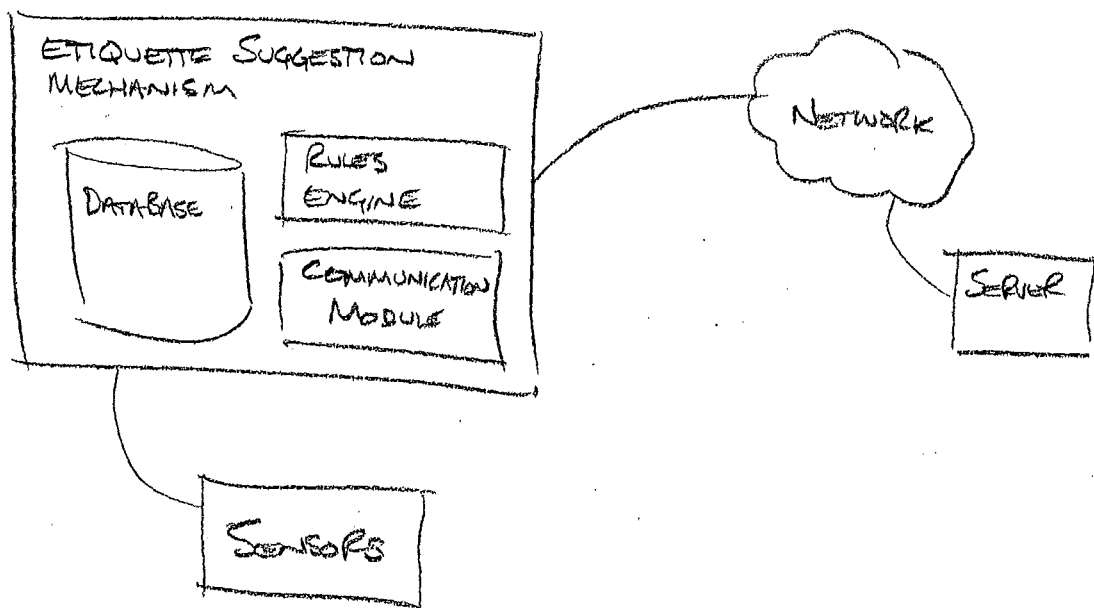


FIG. 13

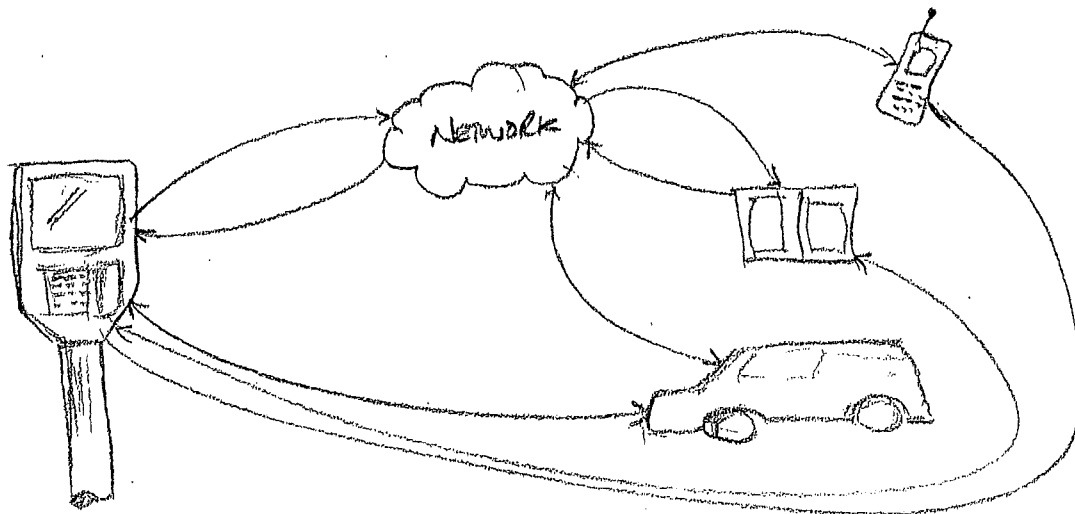


Fig. 14

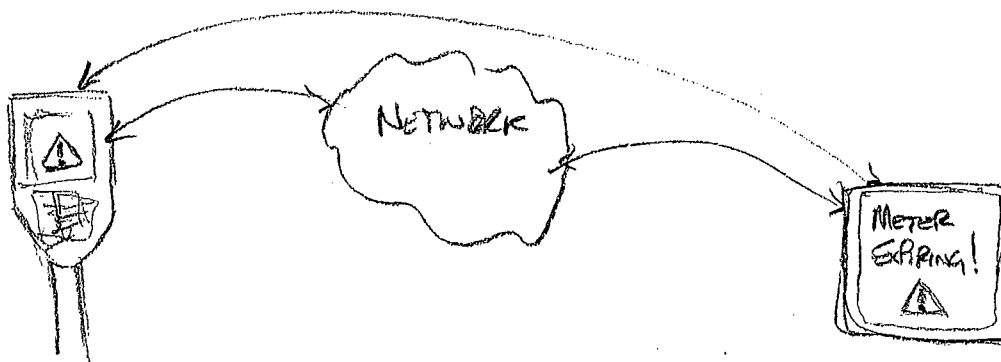


Fig. 15

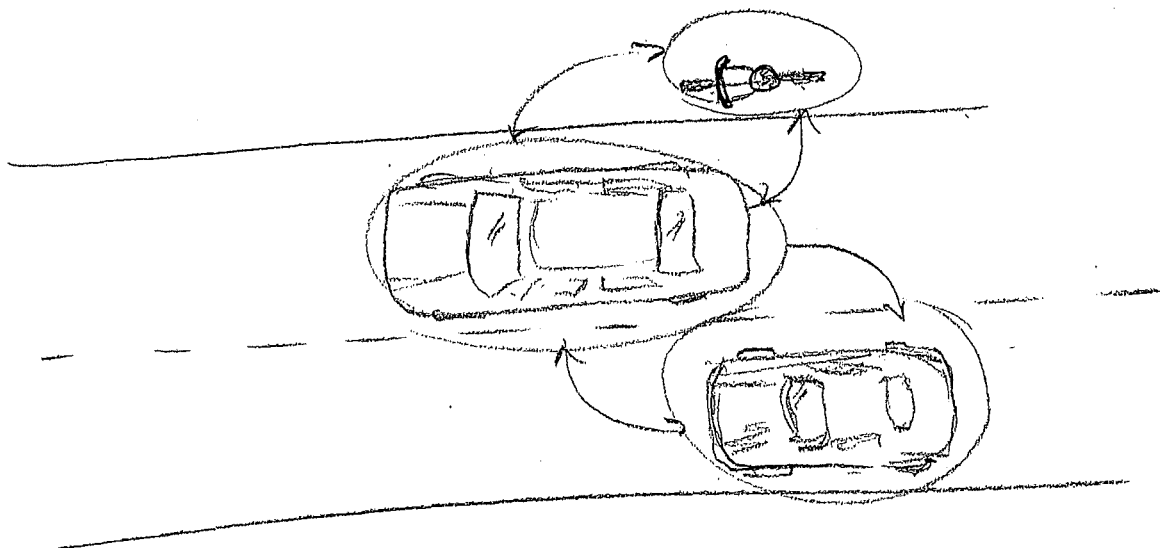


FIG. 16

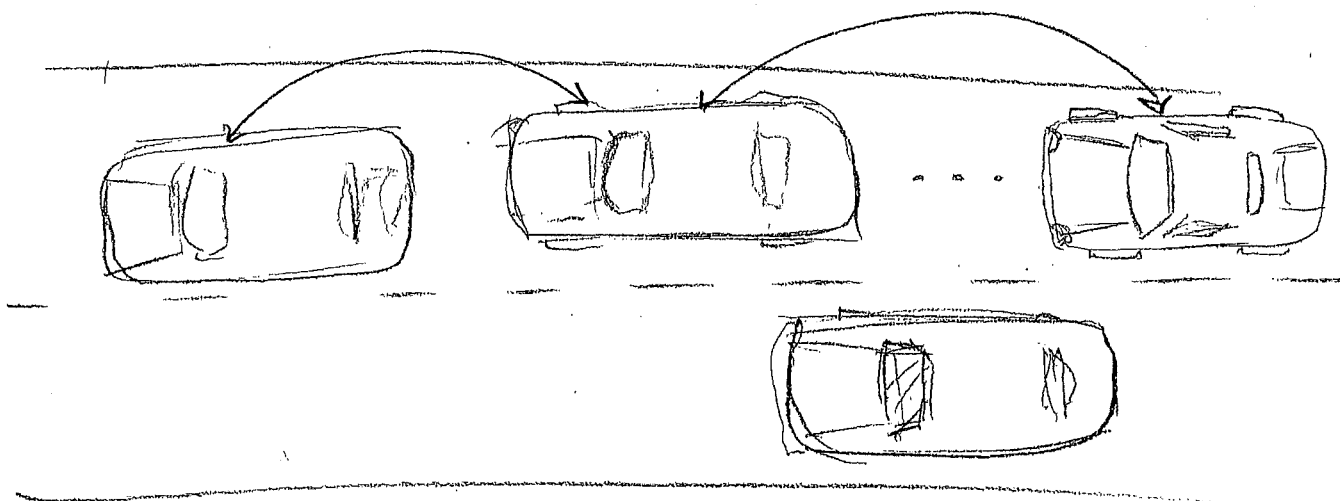


FIG. 17

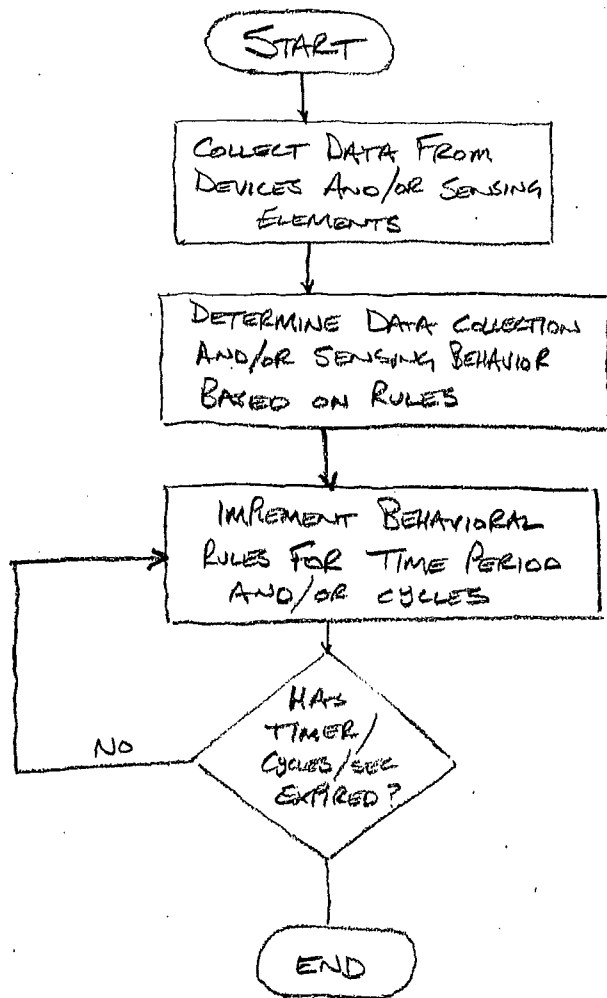


FIG. 18

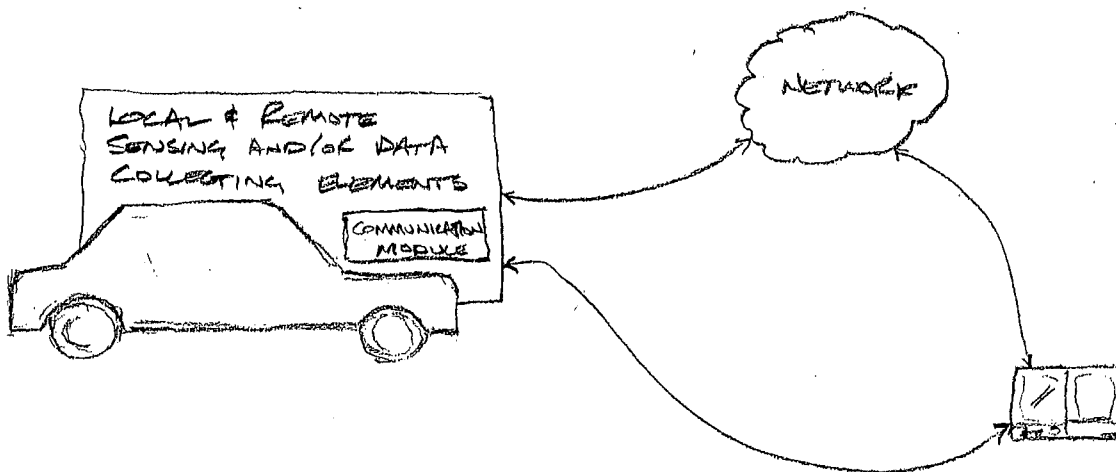


FIG. 19

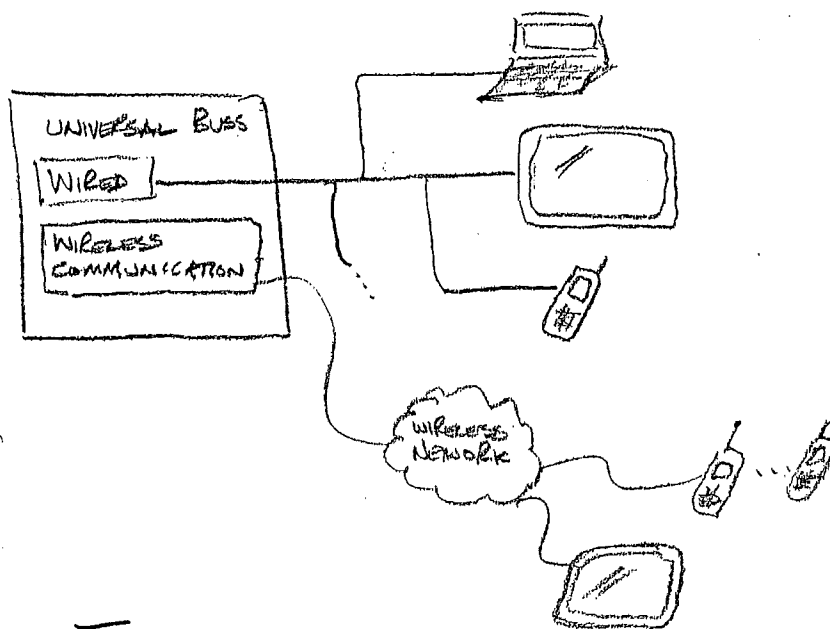


FIG. 20

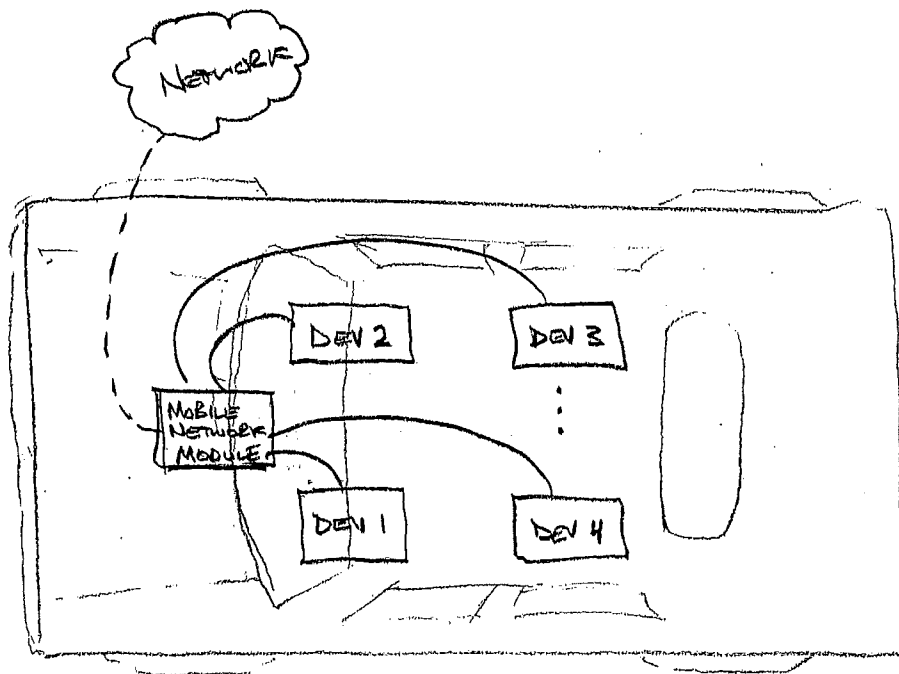


FIG. 21

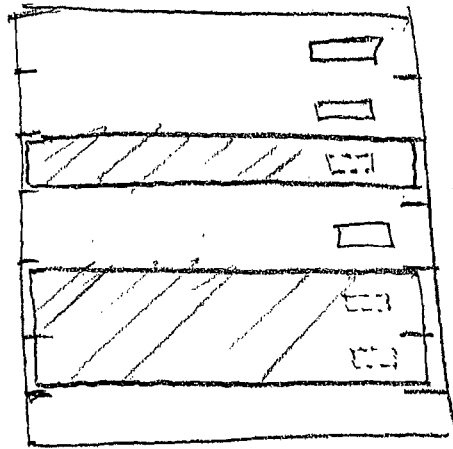


Fig. 22

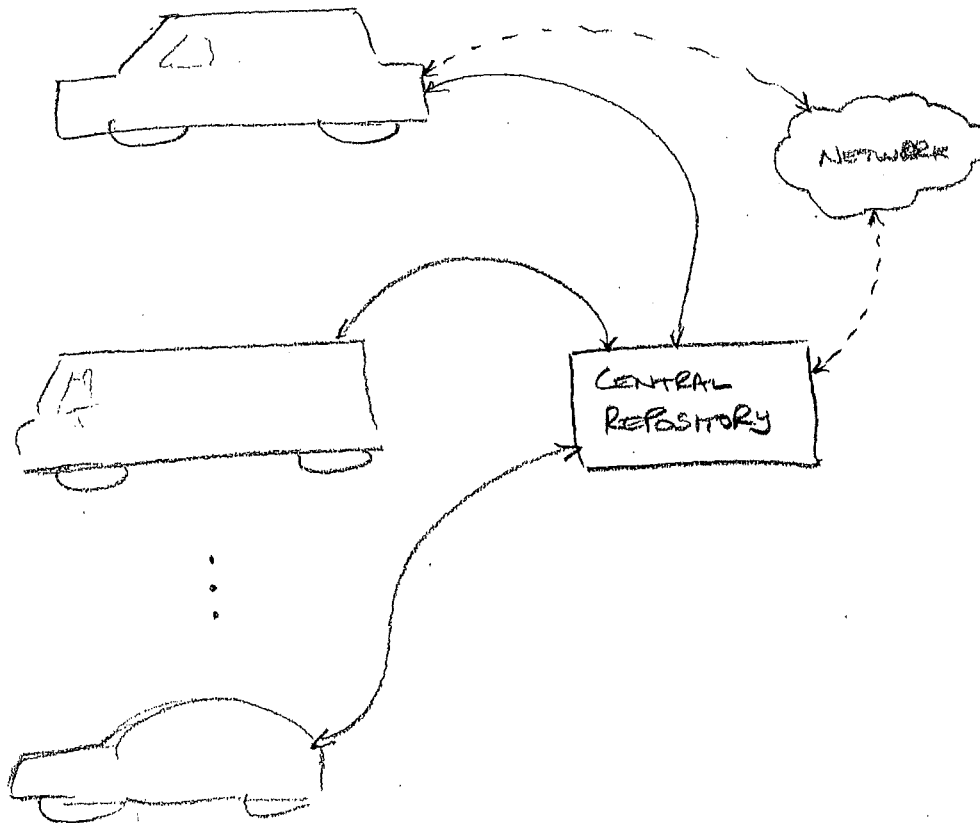


Fig. 23

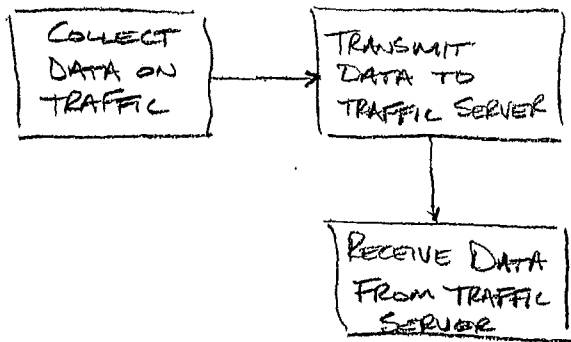


FIG. 24

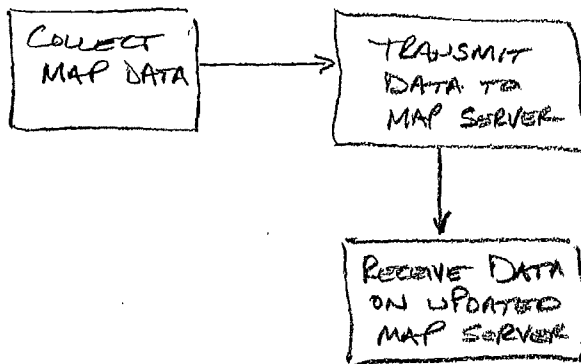


FIG. 25

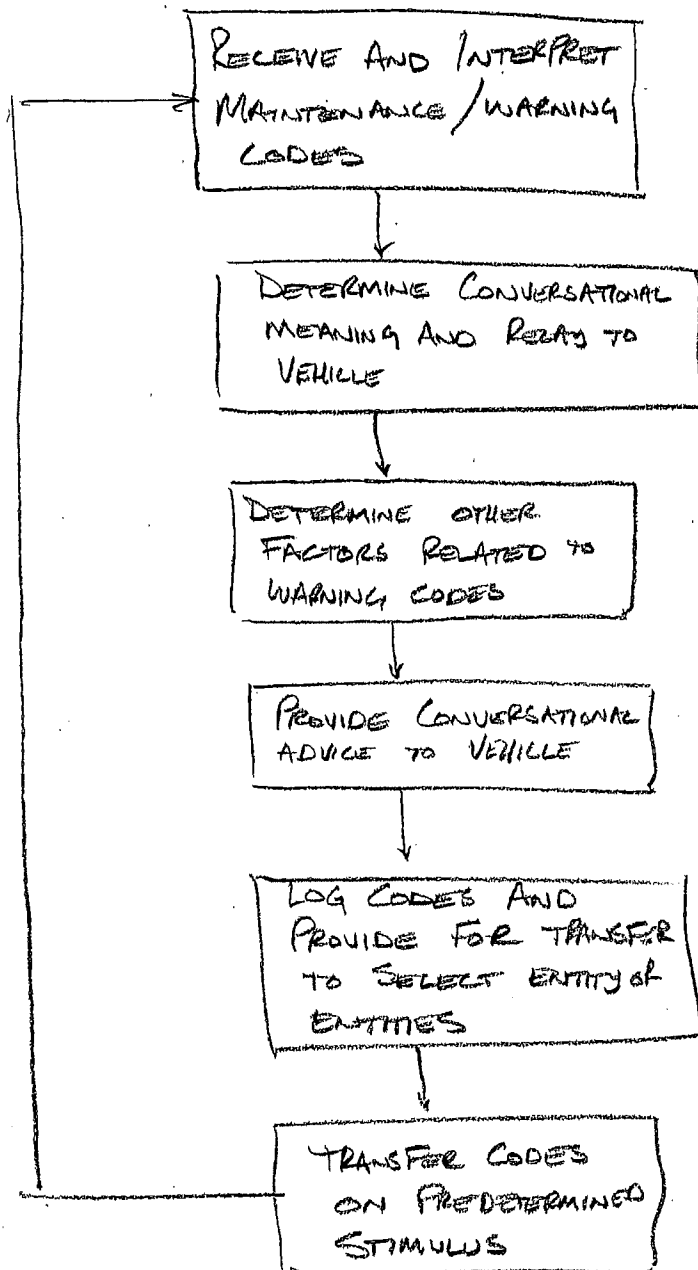


FIG. 26

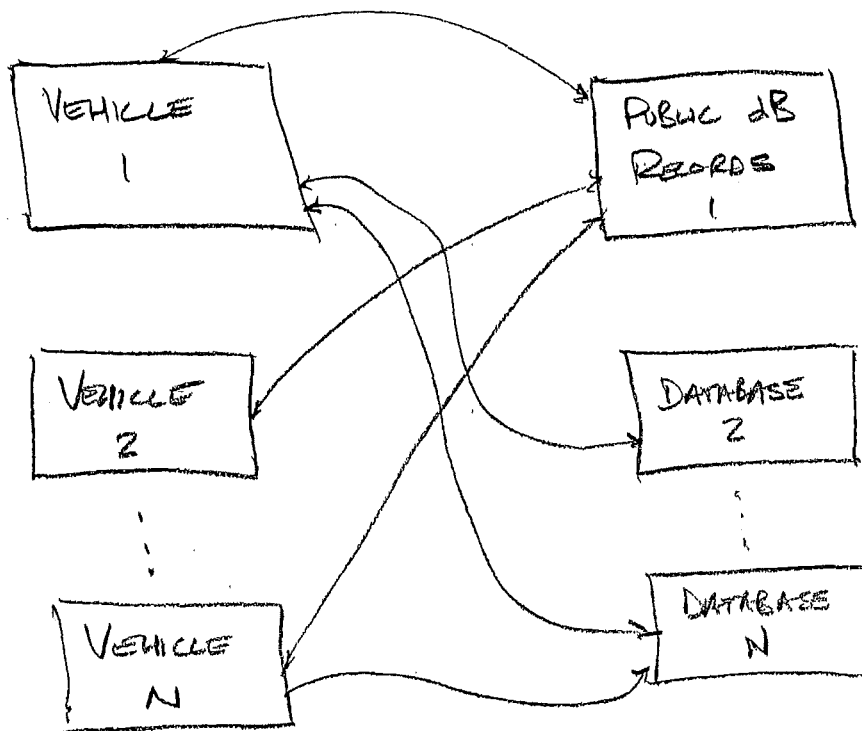


FIG. 27

EXHIBIT A

Flextronics Adaptive Automotive Architecture

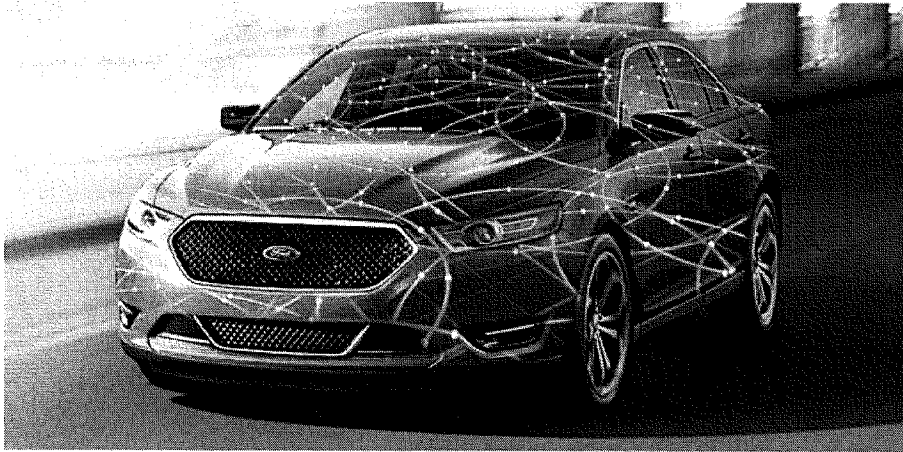
A Proactive Approach to Automotive Connectivity

The Flextronics Adaptive Automotive Architecture (FlexA3) is transforming the way manufacturers control motor vehicle connectivity and multi-modal communications through a flexible and cost effective architecture.

Evolution Increases Data Complexity

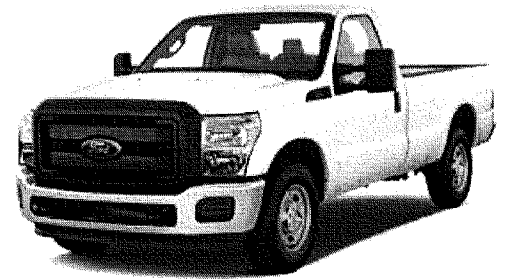
From analog gauges and multiple wiring harnesses to flat screens and protocol-based data busses; cars have evolved into complex electronic environments. The current convergence of fixed and mobile technologies has provided phenomenal benefit to the driver and automotive manufacturer — but not without risk.

The biggest challenge is the management and integration of an ever-increasing number of data sources that ensure that the vehicle a) operates correctly and safely, b) has information features that match the consumer's lifestyle, and c) meets regulatory requirements as they evolve.



Supporting the need for improved control of data stream management and integration is the ever-increasing sophistication of each data segment and the need for data sharing amongst all segments. Today's vehicles are capable of providing communication with electronic road infrastructures such as traffic signals, toll booths and municipal parking facilities. Drivers are accessing data from internet service providers via smart phone, tablet or embedded technologies as well as utilizing hands-free communication technology to send and receive phone calls and text messages. Automotive manufacturers are sending and receiving data based on electronic sensor readings and event data recording.

As the number of stakeholders sending and receiving data increases, it makes it more difficult for the manufacturer to control and manage the driver's experience.



Multiple Clouds Creates More Risk

Increasingly, Cloud based infrastructures and resources are being deployed to meet the demand for automotive data. As a result, there will likely be numerous cloud services involved to handle the disparate needs of the vehicle creating additional challenges for the manufacturer such as:

- Increased security risk for cyber attacks
- Increased need for interoperability of the diverse systems
- Increased constraints on design changes due to the locked in technology

The Driving Experience Creates "BRAND" Perception

Driver's need to be able to integrate their digital lifestyles into their vehicles and have it all function easily from their fingertips and voice. When the capabilities don't function properly, it puts the vehicle's brand reputation at risk. Given the increasing number of complex data streams and cloud based service options available and the challenges they present, the ability for the manufacturer to control the driving experience in the current environment is in jeopardy.

FlexA3 Delivers Flexibility and Control

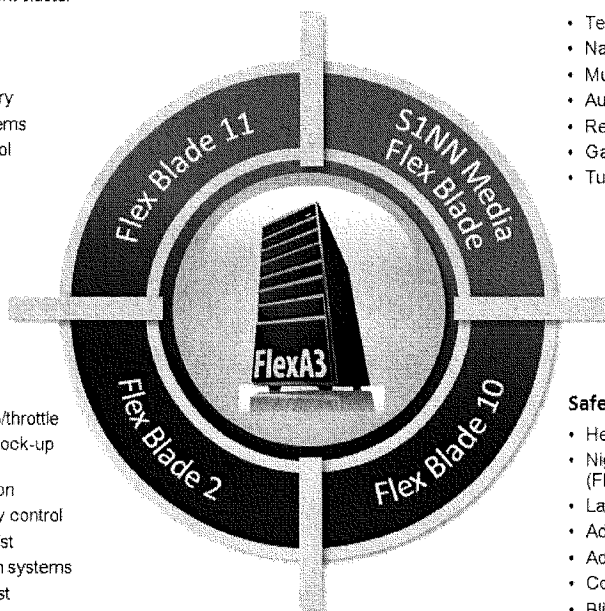
The Flextronics Adaptive Automotive Architecture (FlexA3) product addresses many of the core connectivity challenges facing automotive manufacturers. The FlexA3 solution allows the vehicle data streams that are becoming pervasive to be integrated and managed to ensure the best possible driving experience to the consumer. Additionally, vehicle manufacturers are provided a means by which they gain control of the entire data management system, technology introductions and upgrading, choosing strategic partners as well as creation of new revenue opportunities.

Comfort and Convenience

- Dashboard/instrument cluster
- Lights/seats
- Climate control
- Voice recognition
- Remote keyless entry
- Security alarm systems
- Wiper/window control

Safety Mechanical

- Engine transmission/throttle
- Brake power assist/lock-up control
- Electronic suspension
- Traction and stability control
- Parallel parking assist
- Occupant protection systems
- Power steering assist
- Self-diagnostics
- Event data recorders
- Steer by wire/brake by wire
- Vehicle-to-vehicle (V2V)
- Vehicle-to-infrastructure (V2I)
- Partially/fully automated vehicles



Infotainment and Communications

- Telematics
- Navigation/GPS
- Multimedia systems
- Audio systems
- Rear seat entertainment
- Games consoles
- Tuners (SDR)

Safety Feedback

- Heads-up display
- Night vision (FLIR-Bosch-Fluke)
- Lane departure warning
- Adaptive cruise control
- Adaptive headlights
- Collision warning
- Blind spot sensors
- Park/reverse assist
- Tire pressure monitoring
- Traffic signal recognition
- Vehicle tracking/LoJack®

Modular Design Ensures Scalability

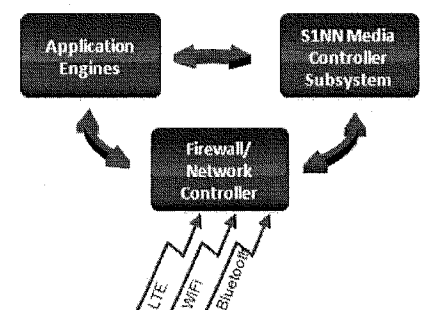
The FlexA3 architecture can also be implemented using different families of technology. The architecture integrates presentation functions, sensor/control functions, and infotainment functions in a highly modular extensible way ensuring that the system design can scale up or down easily and evolve over many model years without battling technological obsolescence.

FlexA3 delivers a system architecture that supports multiple blade-style processors ("FlexBlade™") that anchor specific functions to a given processor. This ensures that critical real time events can be serviced within the required "response window". The multiple FlexBlade architecture also allows functional upgrades either at initial purchase or over the lifetime of the vehicle.

With FlexA3, you are also getting future technology today. The FlexA3 is designed in partnership with vehicle manufacturers and subsystem suppliers such as S1NN. This design process allows customization and differentiation to occur among models, without burdening the final systems with obsolescence or high support costs. The S1NN Media Controller advanced head unit with evolvable capabilities that is expected to be deployed in future vehicles manages the infotainment system in the FlexA3 architecture.

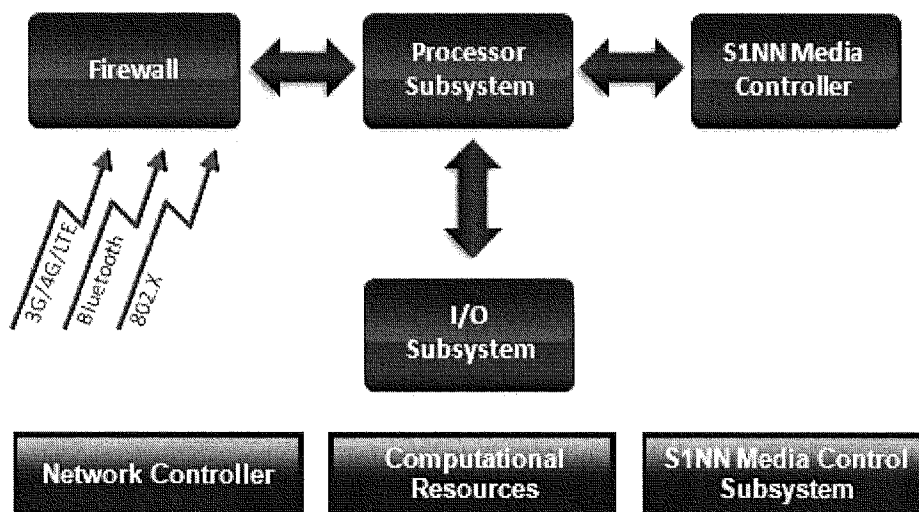
Technology Agnostic Freedom

The FlexA3 modular architecture provides the car manufacturer total flexibility in developing an operating environment that acts as a foundation upon which features and functions are easily implemented and modified. The software environment implements the architecture and the environment does not need to change over technology generations. Car manufacturers have the freedom to specify any type of processor, memory or storage technology and to make appropriate changes at any time.



Supports Current and Future ECU Subsystems

Management and integration of all embedded ECU data sources, such as those provided by LIN, CAN and FlexRay is supported by the FlexA3 architecture. Plus the architecture supports IPv6 connectivity which enables seamless migration to Ethernet based sensor technology and new bus structures supported by the AutoSar initiative. The FlexA3 system is enclosed in an advanced EMI-shielded enclosure with multiple configured FlexBlades. A FlexBlade is composed of a processor and memory that serves as a shared or dedicated resource. The removable connector panel grants the car manufacturer easy access to custom-configure their FlexBlades as needed for specific models and in reaction to advancements in technology.



FlexA3 "Box" is engineered for EMI

Improved Safety and Security

FlexA3's single data management "hub" approach improves vehicle safety in the face of potential malware threats posed by connectivity to the Ethernet. All external sources of data that are used in the vehicle must pass through the FlexA3 firewall ensuring security and compliance.

Delivers Personalized Driving Experience

The FlexA3 enables vehicle manufacturers to manage multiple display subsystems that are unique to their location in the vehicle and deliver vehicle owners a personalized experience.

- Console Display – information and I/O control of FlexA3 system
- Configurable "Dashboard" Display
- Configurable Heads-up Display
- Passenger Display Units.

Configurable displays allow drivers to add/change "gauges" for non-vehicle operation information that is displayed on the dashboard and heads-up display to their needs and organizes the gauges location by operator. Direct video is delivered through display controllers or interactive touch screen; all implemented with Ethernet-based intelligent display subsystems. Handheld devices interface wirelessly to the FlexA3 system.

The FlexA3 Event Data Recorder Subsystem ("EVRs") captures operational data on a continuous sampling process and transmits the data to the vehicle's Cloud Storage on a "batch" basis. Visualize the collected data supporting an insurance company's "good driver" program, or the vehicle manufacturer's quality and performance assurance program, or being used by the vehicle owner.

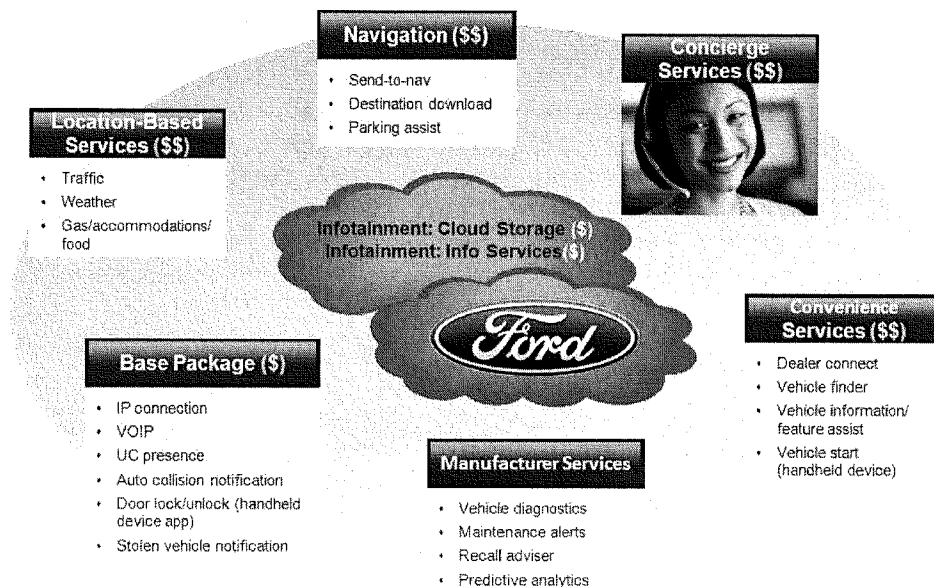
Bridging to the Future

FlexA3 allows the vehicle manufacturer to start small, differentiate between models, and extend capabilities without changing the system architecture or the software environment.

A basic FlexA3 system can be built with an A3 Firewall, a single Flex Master Blade, and the S1NN A3 Media Controller. The model level capabilities can be tuned to the market by using different levels of processing power, as well as enabling different features within the software environment. This reduces the maintenance across models, but still allows extra revenue to be collected for enhanced features. The basic FlexA3 system would connect via Bluetooth or WiFi to the consumer's "smart phone" for connection to Cloud Based Capabilities.

As demand increases for newer features or the manufacturer wants to migrate to an Ethernet based environment the FlexA3 system architecture will accommodate the newer, more data intensive environments. FlexA3 accomplishes this by allowing the vehicle manufacturer to upgrade the application engines, add application engines, upgrade the in-vehicle networking capabilities, upgrade Internet connectivity, upgrade display capabilities, and migrate to high availability capabilities, all without radical changes in the software environment.

Ford Cloud: Monetizing Connectivity



The Flextronics Adaptive Automotive Architecture results in benefits to all stakeholders

- Enables greater flexibility for car manufacturers in choosing technology partners
- Moves Industry one step closer to a standardized Internet protocol
- Sets a foundation for establishing effective cyber attack prevention
- Provides improved event data recording
- Simplifies the isolation and interoperability of automobile operations and all other ancillary networks
- Provides efficient software and features upgrading of vehicle

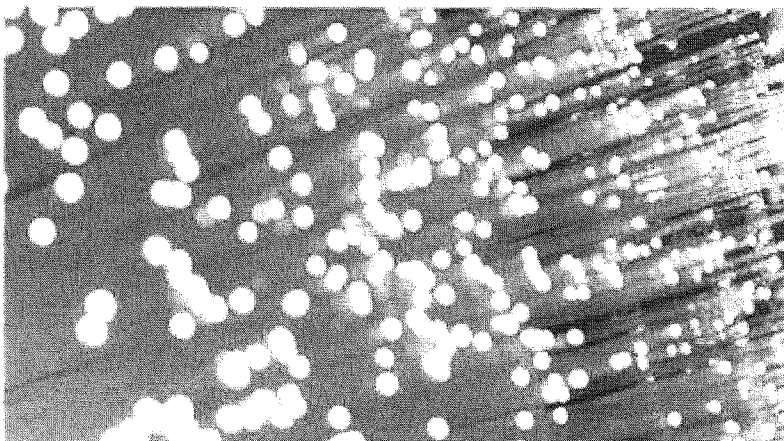
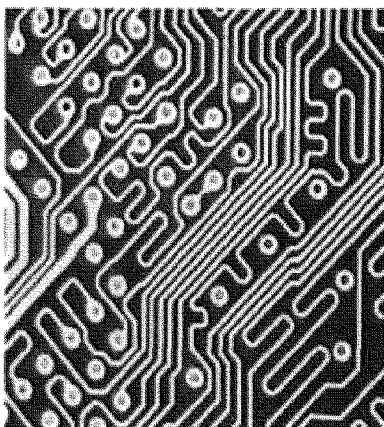
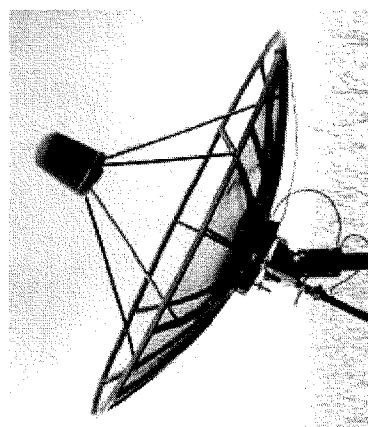
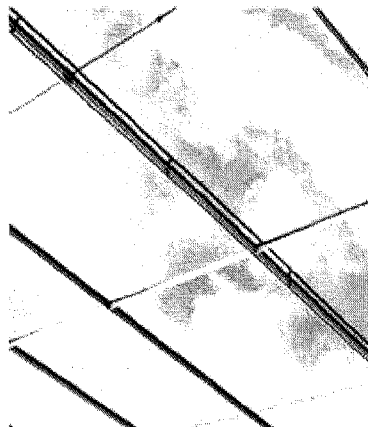
For more information about the FlexA3, please contact Chris Ricci at chris.ricci@flextronics.com or 408.576.1970

Flextronics is a leading Electronics Manufacturing Services (EMS) provider that offers complete design, engineering, and manufacturing services to aerospace, automotive, computing, consumer digital, industrial, infrastructure, medical and mobile OEM customers. With a network of facilities in 30 countries, Flextronics helps customers design, manufacture, distribute and service electronics products worldwide.

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EXHIBIT B

FLEXTRONICS X



Flextronics Capital *Opportunity Discussion* June 2012

CONFIDENTIAL

Agenda

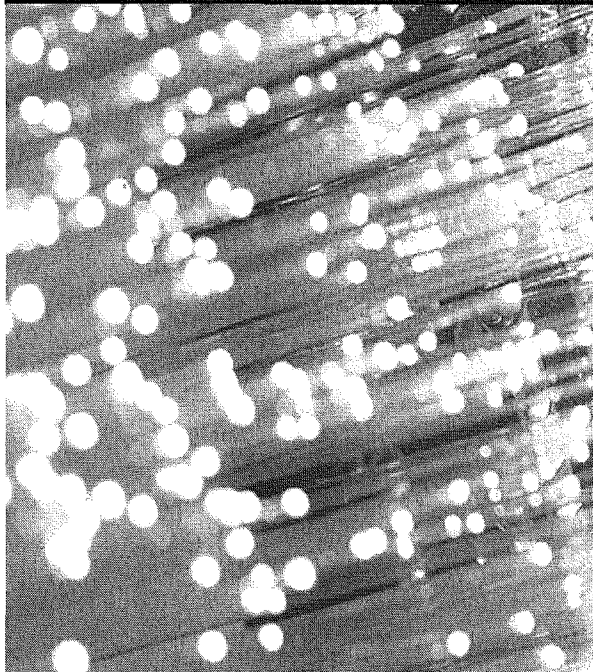
Opportunity

Approach and Governance

Business Case

Implementation

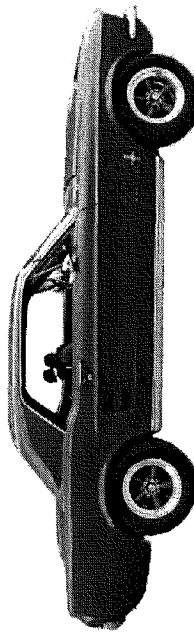
Next Steps



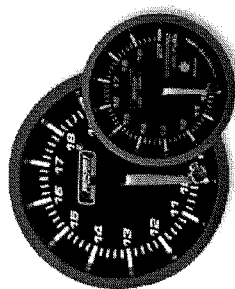
Flex Adaptive Automotive Architecture

**Gauge to Flat Screen:
*The IP Connected Car***

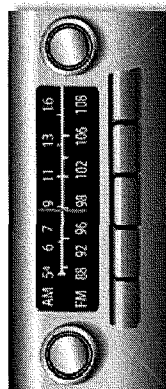
Gauges



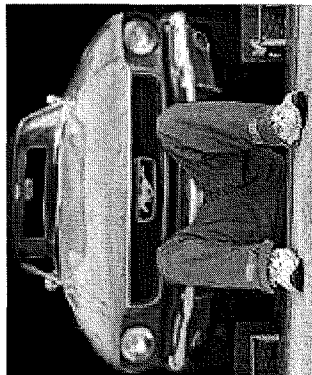
Analog Instrumentation



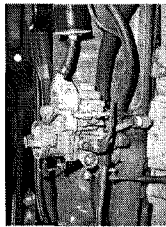
Wiring
Harnesses



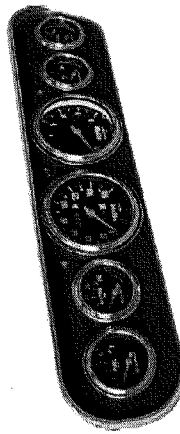
Information Stream:
AM/FM Radio



"Shade Tree"
Mechanics



Carburetors
(yuck!)

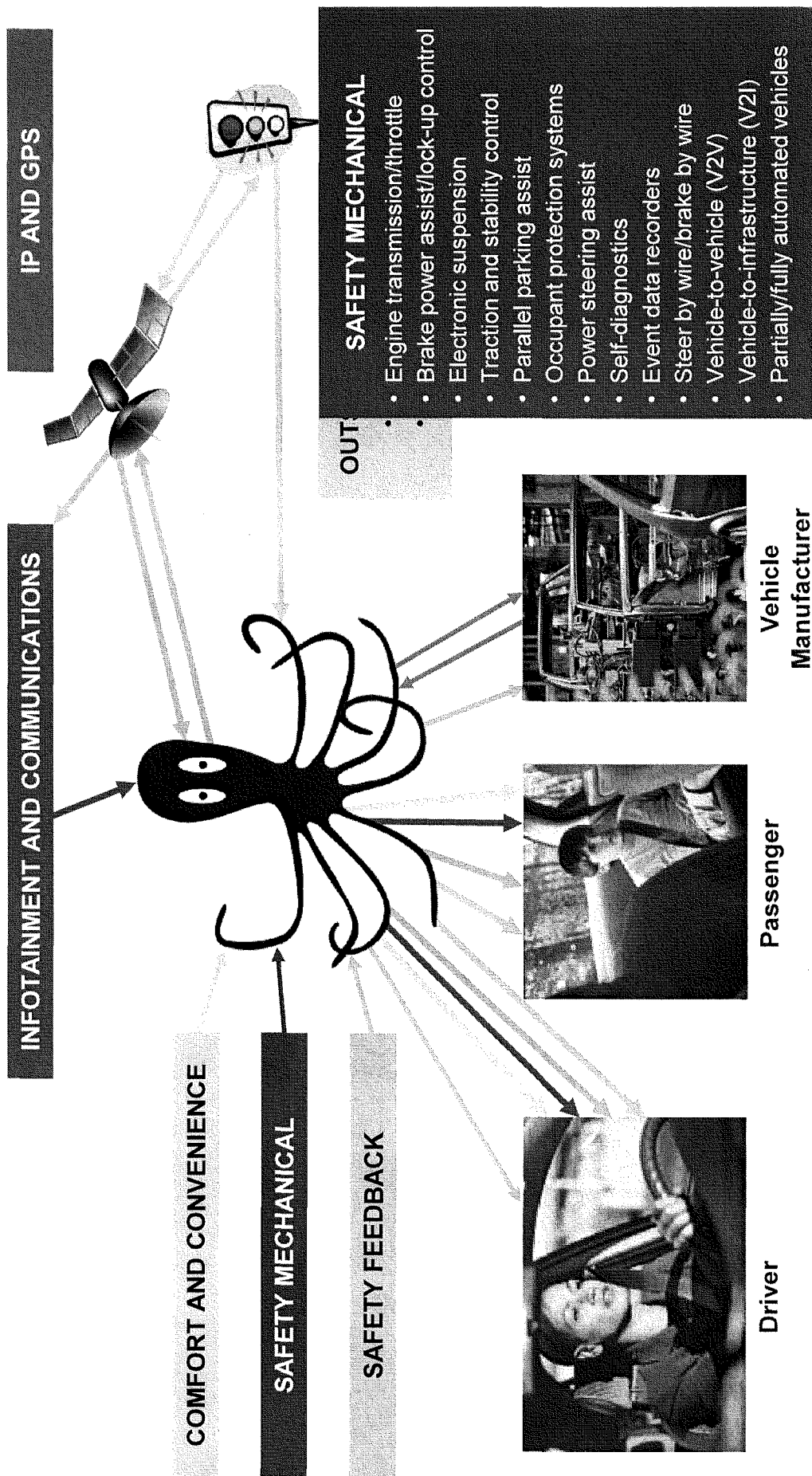


Mechanical
Engine Controls

Reliability: ~100,000 (?)

FLEXTRONICS X

Data Streams: The Problem



Perfect Storm Is Hitting the Vehicle

TECHNOLOGY

- Head-up display
- Efficient engine controls
- Fast processors
- Smart sensors

COMMUNICATIONS

- "4G/LTE": Fast pipes to the car (Ethernet-based)
- Ethernet control loops
- EMI shielded boxes/control loops
- Unified communications, including "presence"

REGULATION

- Fuel efficiency
- Operational safety, including "eCall"
- Control of handheld communications

CONSUMER SERVICES

- "iContent" from all personal sources
- Fault reporting/service advisory
- "Concierge" services

6

FLEXTRONICS X

A Complex Problem

100,000,000 lines of code and growing

Multiple data streams

Multiple networks

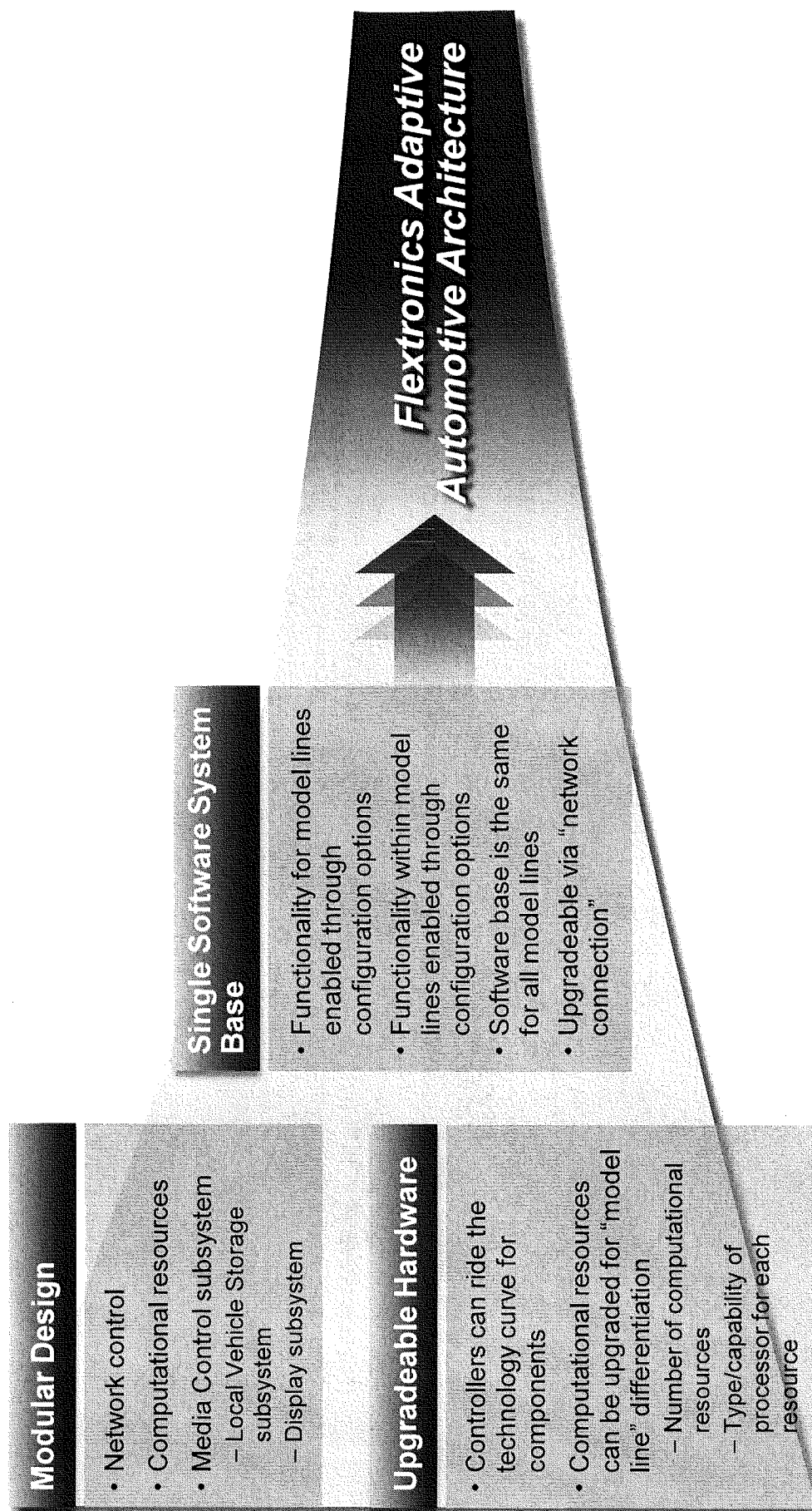
Multiple protocols

Systems sharing data

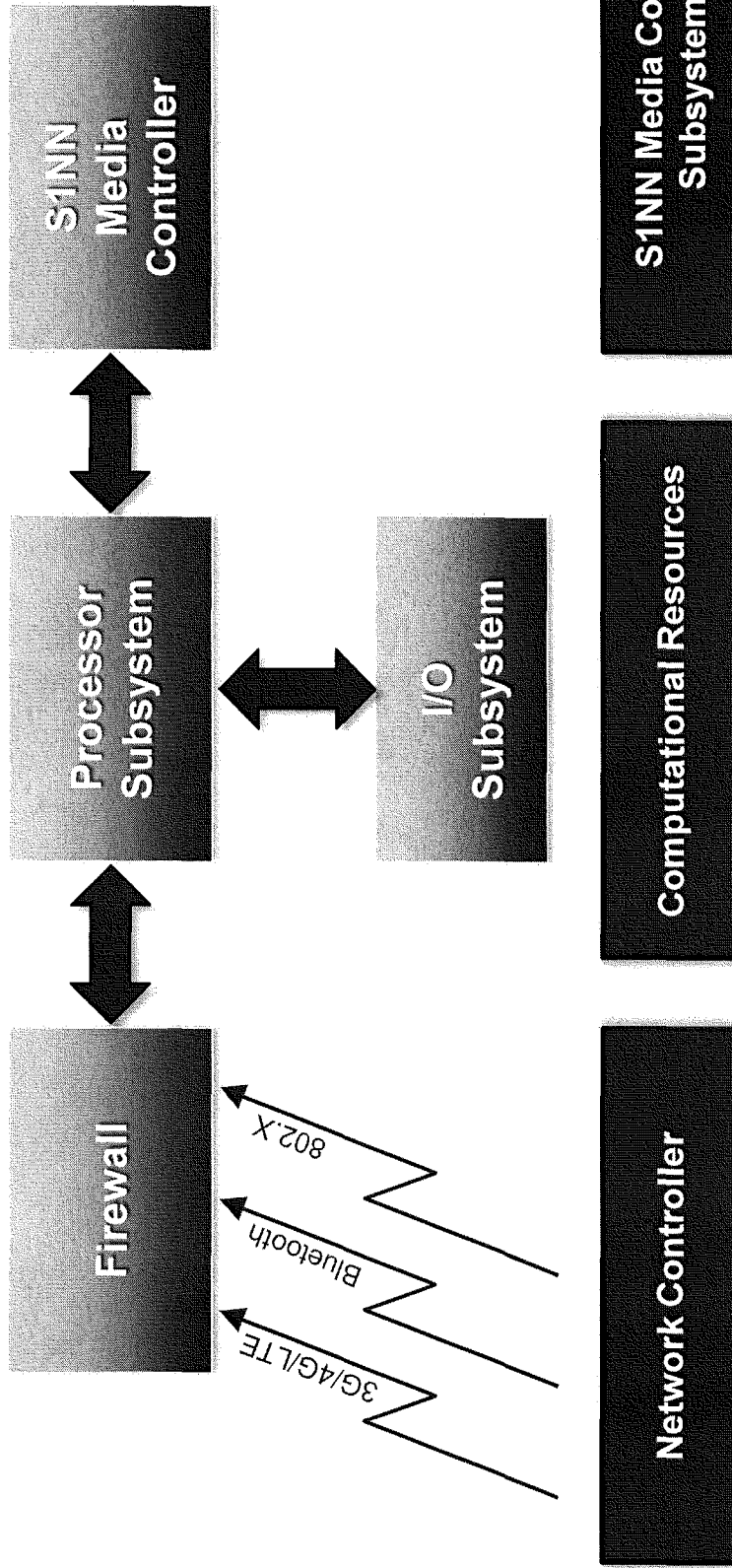
Systems requiring isolation

Increasing safety regulation

The Solution



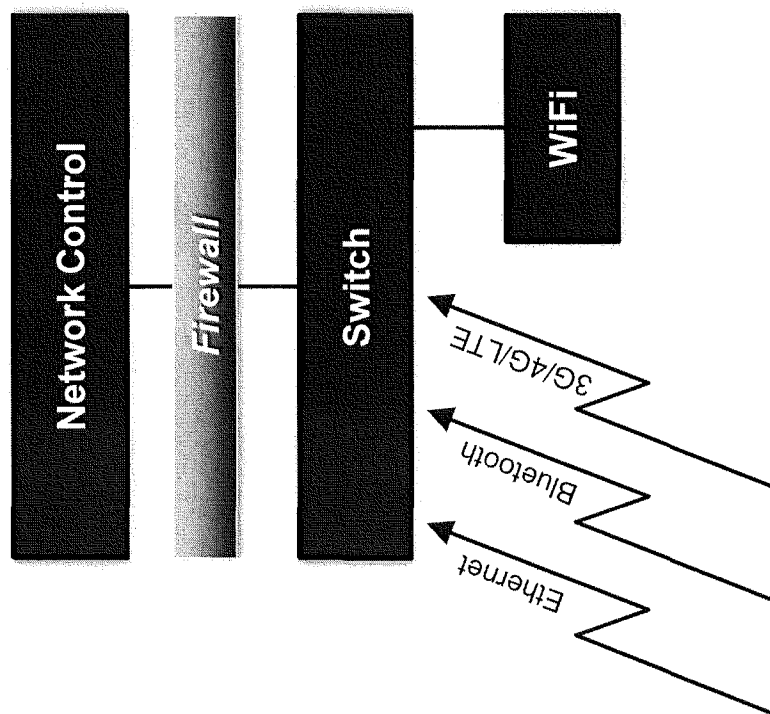
Flex A3: Architecture Overview



FlexA3 “box” is engineered for EMI isolation

FlexA3: Network Controller

- Controls all communications input to vehicle electronics
- Commercial grade firewall
 - Scans input for virus, malware
 - Firewall definitions/software upgrade on a periodic schedule
- Ensures that customer devices don't compromise electronics system
- Supports Media Control subsystem virus/malware detection and elimination capabilities
- Ethernet switch supports simultaneous multiple channel access to computational resources
- Firewall and network controller execute on firewall blade



FlexA3: Built-In Communications

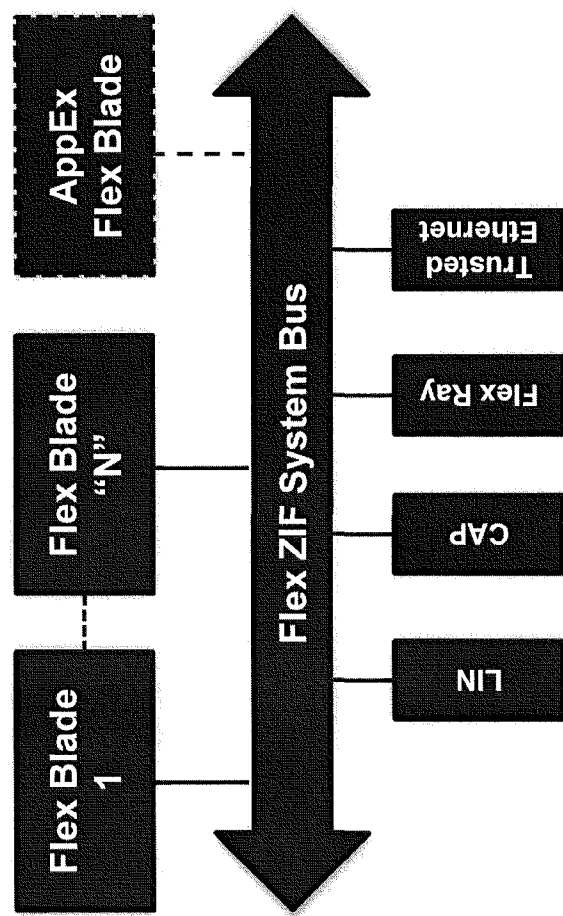
- Vehicle has a “network” connection – car is an IPv6 node
 - Absolute “address” to find vehicle on Internet
 - Simplifies implementing cyber security
 - Enables applications that support safety and data collection for predictive analytics
- Enables eCall
 - Always “on” Internet link
 - Event Data Recorder subsystem has priority for transmitting accident data
 - GPS and communications towers give detailed accident location information
- Internet “link” can be upgraded to support additional services
- IPv6-enables:
 - VOIP calling (more efficient use of bandwidth)
 - Unified communications “presence” function
 - Simplified integration into “Ford Cloud”

FlexA3: Communications Comparison

On-Board Network		Tethered Network
<ul style="list-style-type: none"> • Always on 		<ul style="list-style-type: none"> • Depends on user having the device
<ul style="list-style-type: none"> • Supports multiple communications protocols 		<ul style="list-style-type: none"> • Only support mobile phone protocols
<ul style="list-style-type: none"> • Connection is through "Ford Cloud" 		<ul style="list-style-type: none"> • Connection is through mobile service provider
<ul style="list-style-type: none"> • Enables data collection and storage 		<ul style="list-style-type: none"> • Need to create connection for data collection and storage
<ul style="list-style-type: none"> • eCall can be implemented simply <ul style="list-style-type: none"> – Direct connection through Ford Cloud to assistance – "Motor club" services and 911 – User doesn't decide – system "just does it" 		<ul style="list-style-type: none"> • eCall only a subset <ul style="list-style-type: none"> – Indirect connection through mobile service provider – 911 is only option – User has to decide where/whom to call
<ul style="list-style-type: none"> • Enables value-added services from Ford Cloud 		<ul style="list-style-type: none"> • Manufacturer value-added services hard to implement
<ul style="list-style-type: none"> • Enables service differentiation based on model lines 		<ul style="list-style-type: none"> • Service level is one-size-fits-all

FlexA3: Computational Resources: Modular System

- Allows a limited number of different physical configurations for model lines
- Allows different physical configurations to support different levels of “trim” within a model line
- Single software base – configurable for features/options/performance
- Includes:
 - FlexA3 Crate
 - Flex ZIF System Bus
 - FlexA3 Master Blade
 - FlexA3 Application Blades (as necessary)
 - FlexA3 I/O Interface Blades
 - FlexA3 S1NN Media Controller Blade
 - FlexA3 Firewall Blade
 - FlexA3 Trusted Ethernet



FlexA3 Crate and Flex ZIF Bus

FlexA3 Crate

- Modular connector panel
 - Allows custom connector selection based on model
 - Can be replaced at Depot Maintenance as required
- EMI shielding built into box
 - Gaskets where necessary
 - Box ensures that the electronics are shielded from harsh environment

Flex ZIF Bus

- Modular design
- ZIF connectors
- Positive “hold-downs” included to ensure that everything “stays in place”

Manufacturing

- Upgrade of options causes different box subassembly to be used
- No “manufacturing line” configurations
- Software is installed as part of final assembly from automated BOM

Maintenance

- Return-to-depot concept minimizes problems with repairs
- Lowers training requirements for dealers
- Simplifies logistics for FlexA3 subassemblies

FlexA3 Master Blade

Software Environment

- Executes basic OS functions
 - Scheduling processes
 - Distributing “apps” to other Flex Blades (if available)
- Executes basic “operational” information capture application
 - Diagnostic code capture
 - Speed
 - Brake sensor position
 - Steering wheel sensor position
 - GPS coordinates
- eCall application
 - Establishes connection to manufacturer “cloud”
 - Ensures eCall data sent for accident

Hardware Environment

- Processor
- Memory
- NVram storage for fast boot

FlexA3 Application Blades

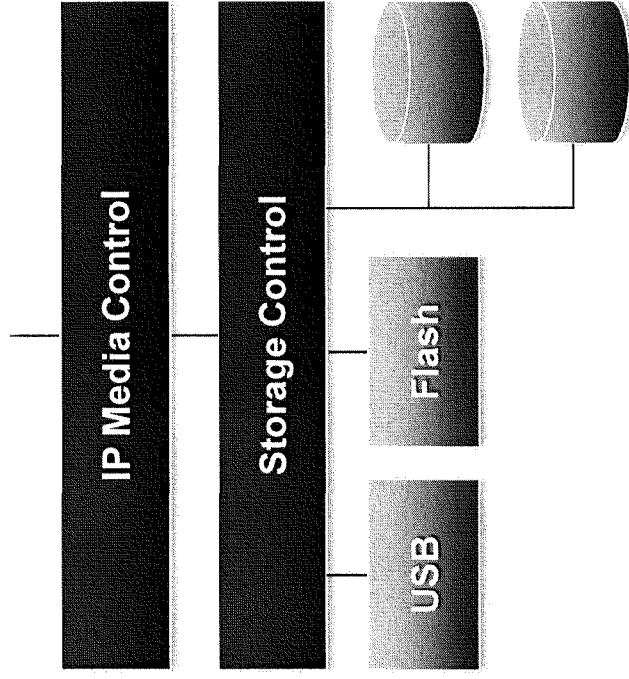
- Application Blades added to the system
 - Increase performance
 - Implement additional purchased “functional options”
- Apps are loaded via Ethernet connection
 - VIN and IPV6 address compared to manufacturer “cloud” registration base
 - Appropriate apps downloaded and installed
- Apps are registered with Master Blade operating environment
- Master Blade assigns app to Application Blade
 - Firewall is a dedicated Application Blade
 - Non-dedicated apps:
 - Assigned to application blade with correct resources
 - Local storage
- Application Blade example: “Cone of Silence,” which is (currently) required by “jurisdiction”
 - Part of initial manufacturer “IPL”
 - Only executes when jurisdiction requires it
 - May have optional parental control that causes it to execute (purchased option)

FlexA3: I/O Interface Blades

- FlexA3 I/O Interface Blades support:
 - LIN Bus
 - CAN Bus
 - FlexRay Bus
- I/O blades differ by having cable to connect to modular I/O panel on Flex Crate
- Support of current I/O subsystems allows graceful transition to Ethernet-based sensors
- FlexA3 supports “Trusted Ethernet”
 - Only manufacturer-supplied or tested sensors can be connected
 - “Smart Sensors” are used
 - Ethernet connection
 - Sufficient “intelligence” to perform emergency functions autonomously
 - Fail-safe design concept (i.e., leaves vehicle in known, safe state in failure)

S1NN Media Controller: Overview

- Combination hardware controller and software control application
- Manages media stores on Local Vehicle Storage subsystem
- Manages removable media (including virus/malware protection)
- Manages Display subsystems (vehicle or handheld)
- Manages “streamed media” from Internet as well as “personal” cloud storage
- Manages cloud-based applications
- Functionality provided on S1NN Media Controller Blade

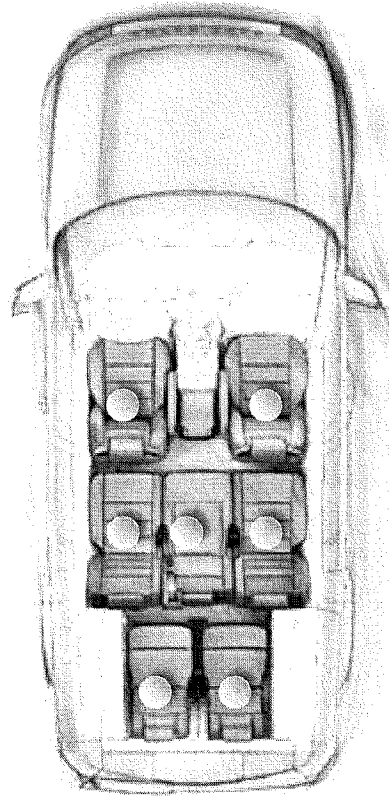


S1NN Media Controller: *Features*

- Software application executes on Flex Blade
 - Provides a common application platform across model lines
 - Enables features based on model lines or available options (\$) menu
- Manages Display subsystems
 - Fixed console information
 - Configurable “dashboard” display
 - Configurable “heads up” display
 - Passenger display units
 - Hardwired units at passenger stations
 - Handheld units at passenger stations
 - Display capabilities at each station are controlled by “Cone of Silence” subsystem
- Cloud-based services
 - Manages a “playlist” to integrate media stored on multiple clouds
 - Managed playlist simplifies download of media to “entertain” all passengers
 - User can “queue up” media to be downloaded from cloud to vehicle
 - Media Controller does “silent load” via WiFi overnight

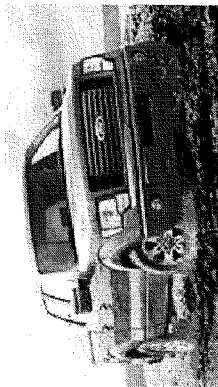
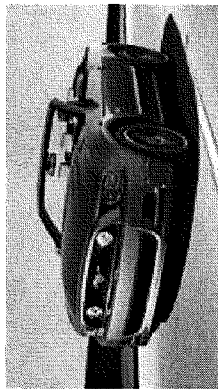
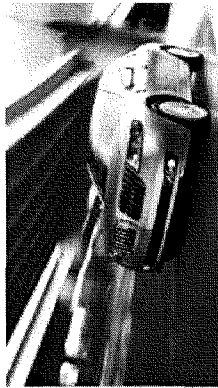
FlexA3: Cone of Silence Detector

- WiFi antenna placed at each “station”
- WiFi interface on Network Controller forces handheld devices into WiFi mode
- Measures signal strength of all devices to compute location of device
- CoS is an application that executes on a base processor
- CoS value is fed into S1NN Media Controller
- S1NN Media Controller consults “jurisdiction” database to see what functions are allowed at specific stations
- S1NN Media Controller can detect movement of handheld device from “authorized” to “nonauthorized” station
- S1NN Media Controller implements “usage” rules for all stations



● = Cone of Silence Detector

Flextronics Adaptive Automotive Architecture: Function Distribution



SAFETY MECHANICAL

- Engine transmission/throttle
- Brake power assist/lock-up control
- Electronic suspension
- Traction and stability control
- Parallel parking assist
- Occupant protection systems
- Power steering assist
- Self-diagnostics
- Event data recorders
- Steer by wire/brake by wire
- Vehicle-to-vehicle (V2V)
- Vehicle-to-infrastructure (V2I)
- Partially/fully automated vehicles

SAFETY FEEDBACK

- Heads-up display
- Night vision (FLIR-Bosch-Fluke)
- Lane departure warning
- Adaptive cruise control
- Adaptive headlights
- Collision warning
- Blind spot sensors
- Park/reverse assist
- Tire pressure monitoring
- Traffic signal recognition
- Vehicle tracking/LoJack®

COMFORT AND CONVENIENCE

- Dashboard/instrument cluster
- Lights/seats
- Climate control
- Voice recognition
- Remote keyless entry
- Security alarm systems
- Wiper/window control

INFOTAINMENT AND COMMUNICATIONS

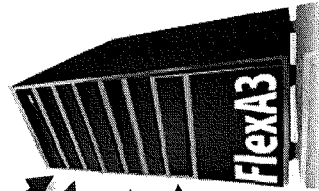
- Telematics
- Navigation/GPS
- Multimedia systems
- Audio systems
- Rear seat entertainment
- Games consoles
- Tuners (SDR)

S1NN Media Flex Blade

Flex Blade 11

Flex Blade 10

Flex Blade 2



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FLEXTRONICS

Example: “Entry” Model Line Scenario

Basic Entry Model

- Small Flex Crate
 - 5-slot backplane
 - Master Blade
 - Firewall Blade
 - S1NN Media Control Blade
 - Application Blades (empty slot)
- Processor: “Atom” handheld device class
- Functions: Basic firewall, eCall, Internet connectivity, **no** streaming

Upgrade Entry Model 1

Basic Model PLUS:

- *Application Blade*: Parental control for CoS, notification of **where** the car is

Upgrade Entry Model 2

Upgrade Model 1 PLUS:

- *Processor*: Upgrade to mobile processor (laptop class)
- *Functions*: Upgrade to media streaming

Example: "Luxury" Model Line Scenario

Basic Luxury Model

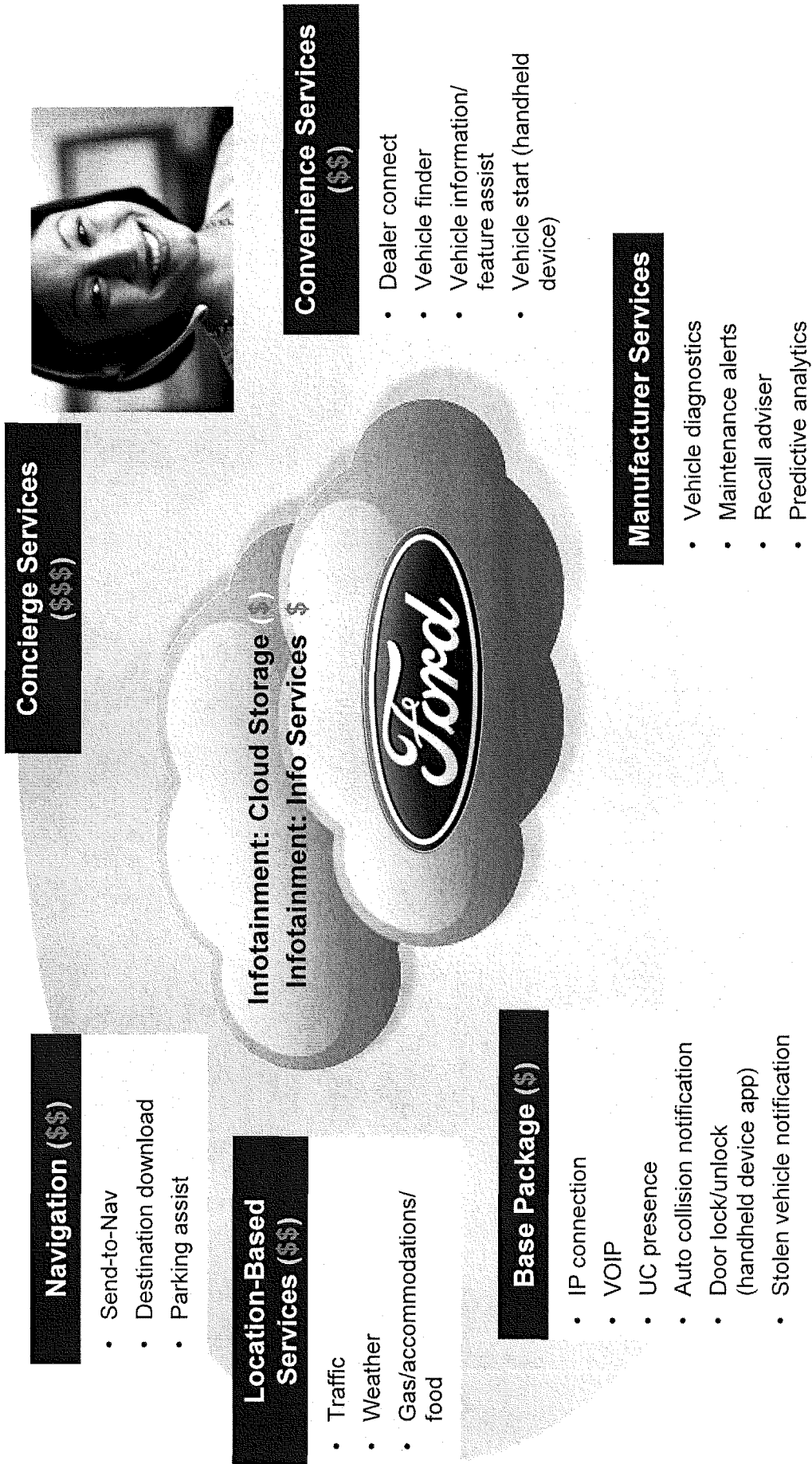
- Large Flex Crate
 - 10-slot backplane
 - Master Blade
 - Firewall Blade
 - S1NN Media Control Blade
 - 3 Application Blades
- Processor: "Core i" advanced desktop class
- Functions: Extended firewall, eCall, Internet connectivity, media streaming, Cos
 - ECU, stability control, power steering, heads-up display, adaptive cruise control, collision warning, wiper window control, keyless entry, rear seat entertainment, climate control

Upgrade Luxury Model

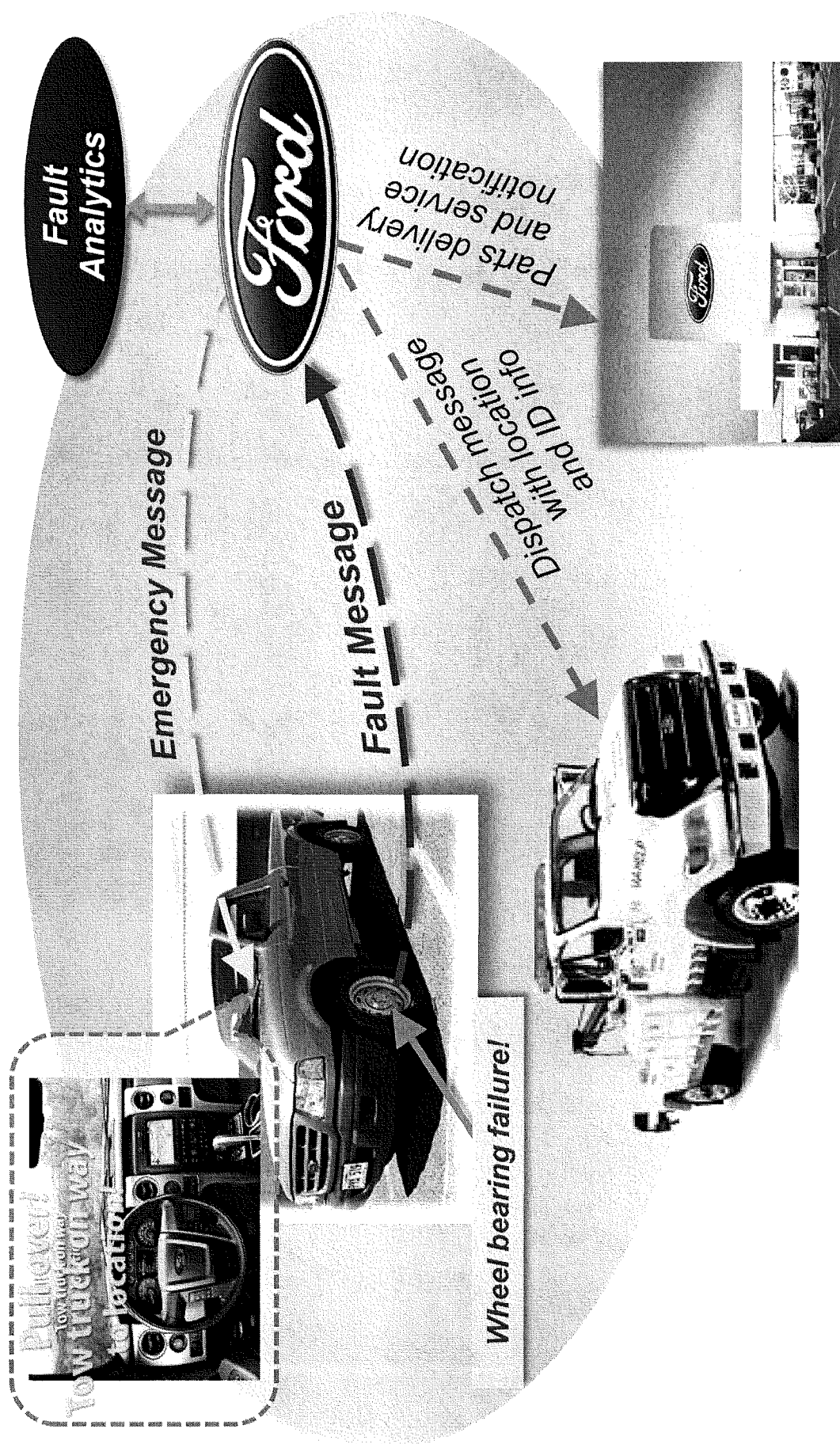
Basic Model PLUS:

- Application Blades: Upgrade to 5
- Functions: Parking assist, electronic suspension tuning, night vision, lane departure warning, blind spot sensor, vehicle tracking (LoJack®), security alarm system, voice recognition, programmable dashboard, navigation – GPS/concierge services

Ford Cloud: Monetizing Connectivity



Customer Satisfaction Scenario



Customer Satisfaction Scenario

Vehicle Action	Ford Response
• Wheel bearing sensor detects fault	• Built-in diagnostic on subassembly
• Fault message sent to Ford Cloud	• Ford Cloud adds to vehicle database
• Repeat fault message sent	• Ford Cloud starts analytics • Repeat message and analytics trigger action
• Message flashes on heads-up display	• Emergency message sent to vehicle
• Driver pulls over and waits	• Dispatch sent to AAA tow service <ul style="list-style-type: none"> – Location: GPS coordinates – Member ID and vehicle ID
• Tow truck picks up vehicle	• Service message to Ford dealer <ul style="list-style-type: none"> – Part ID to be replaced – ETA of part – Appointment notification
• Vehicle delivered to Ford dealer	

Customer Satisfaction

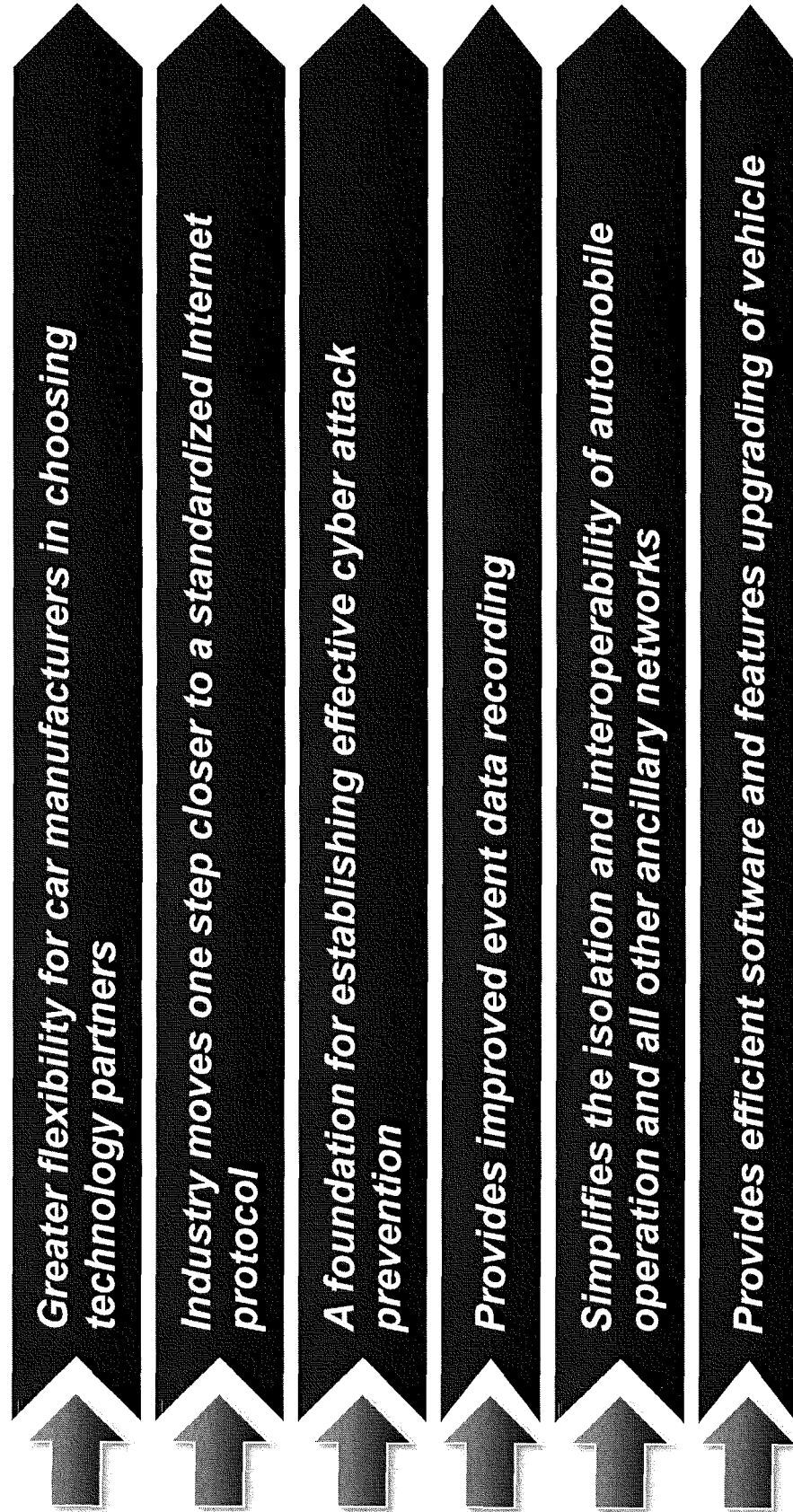
- Early problem diagnosis
 - Proactive action by Ford to find problems before serious accident
- Analytics
 - Compares fault to model history
 - Mileage
 - Environmental conditions
 - Repeat errors trigger action
 - Specific to vehicle
 - Potentially for class of vehicles based on class-based analytics
- Warning message to vehicle operator
- Dispatch of service based on customer profile
 - Data from vehicle gives exact location
 - Allows service organization to update driver on status
- Dealer/parts organization
 - Schedules workload for dealer (more efficient use of resources)
 - Ensures part is at dealer when needed



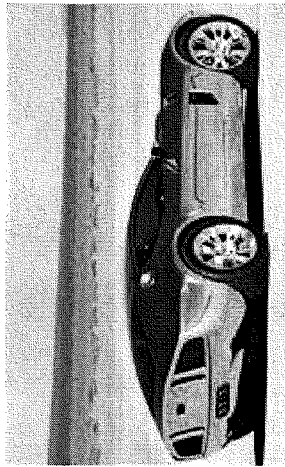
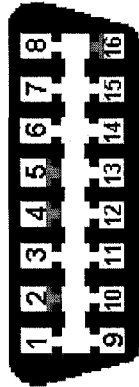
**SATISFIED and
LOYAL Customer**

FlexA3: Data Management Hub

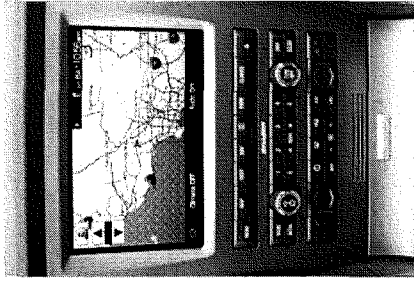
FlexA3, the Internet approach to car connectivity, results in benefits to all stakeholders



Flat Screen

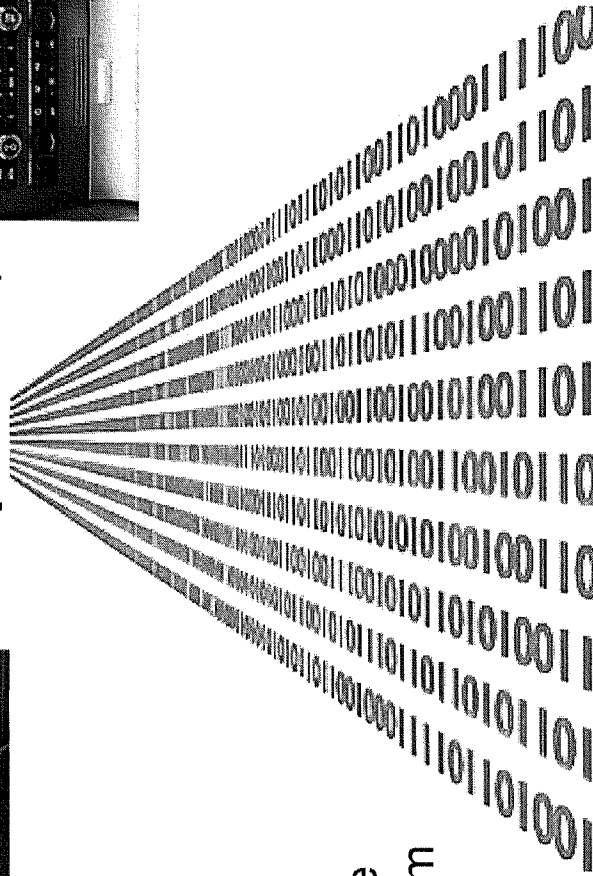


2 - purple - Serial Data line
4 - black - Ground
5 - blk/wht - Ground
16- orange - +12V Battery



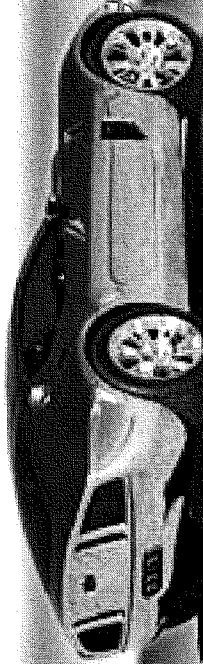
Car of the future

- Digital instrumentation
- Bus-based electronics
- Information stream: Internet
- Complex systems maintenance requiring lots of information from the car
- Electronic safety/feedback



Reliability: ~200,000 (?)

... and Beyond

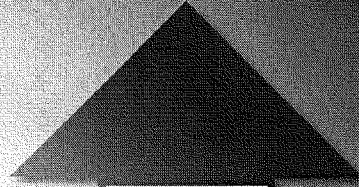


... of changing technology ...

... Flextronics Adaptive Automotive Architecture ...

... provides a firm foundation
for simplified deployment of
emerging technologies

FLEXTRONICS 



Thank you

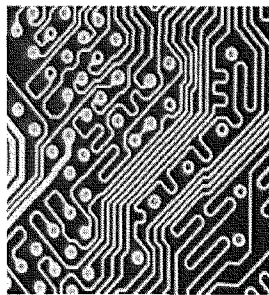
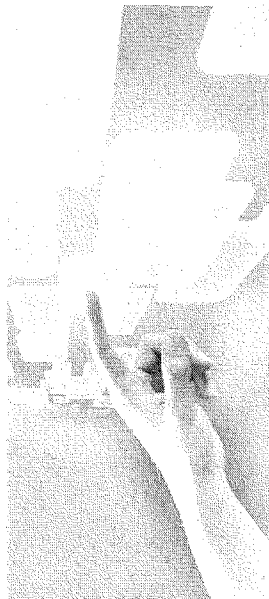
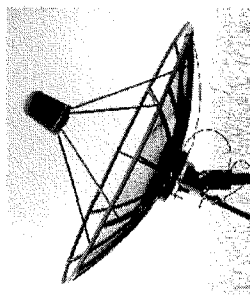
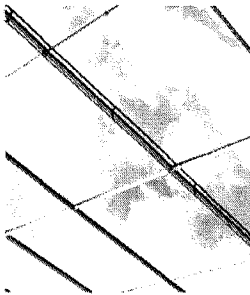


EXHIBIT C

Attached is a presentation recently put together to advance the concept. Hopefully you will find some new thoughts in there. In addition, here are a couple more:

1. The ability to move results between displays. That is, a person using a touch screen in the back seat can search the internet for a restaurant. When one is found, they can "flick" the image to the front console where the driver can view it and elect to navigate there, assisted by the console GPS.
2. The brains of the console, or head unit, is modular (I may have disclosed this before). Since autos designed now are rolled out four years from now and then have a six year life cycle, the technology is stale by the time it comes out. Thus, the brains are in the trunk, under the hood, or otherwise accessible and upgradable. Essentially, it contains a low cost processor to handle basic functions. Then someone can insert a real, state of the art processor at production time. Further, other modules can include a module for cellular data, which is different depending upon the carrier, the current non-cellular data standard (3G, 4G, etc.), and the like. Users may upgrade as necessary as the car ages, so the technology remains current.

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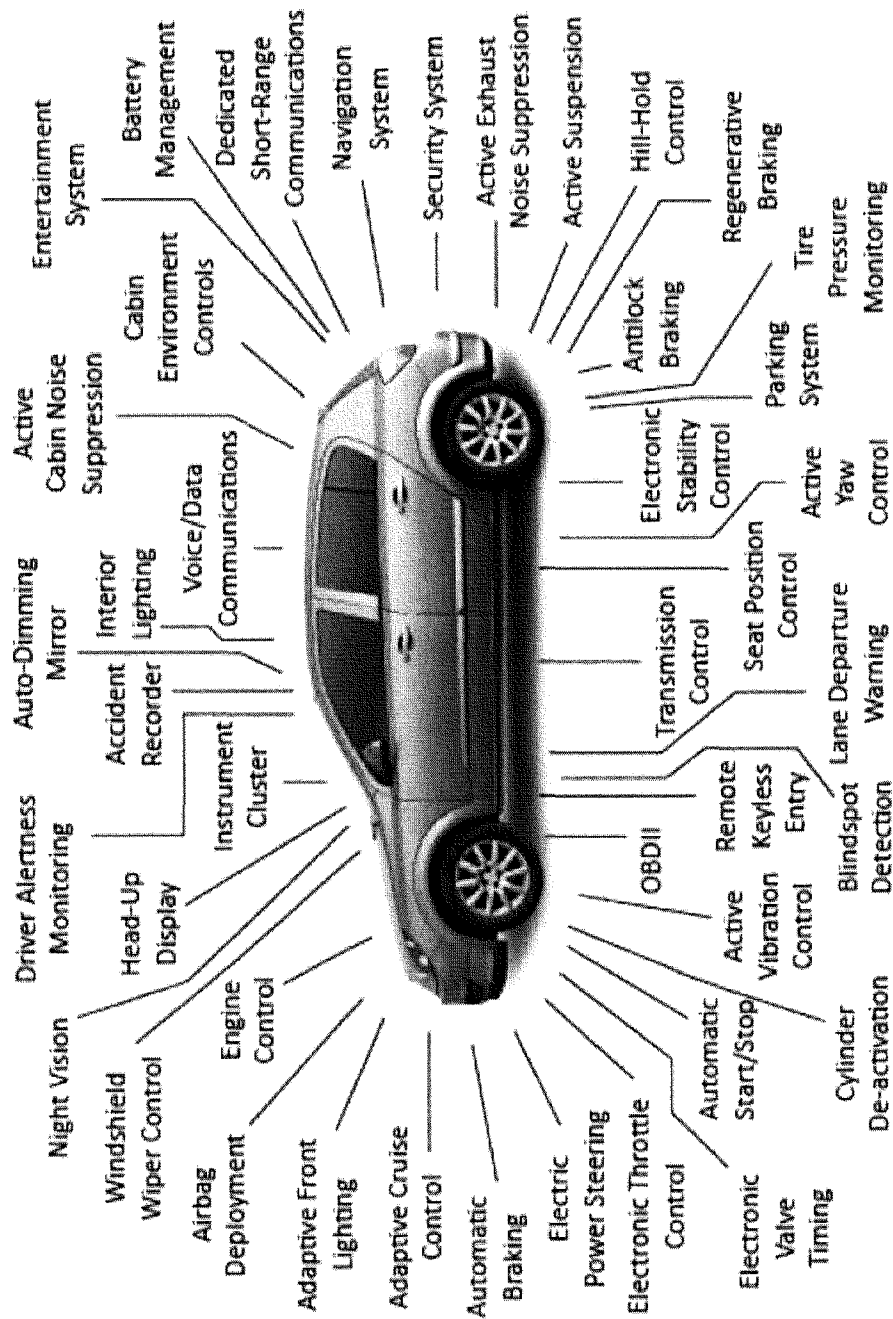


Project Octopus

The IP Connected Car



Connected Car – THE Problem



2/16/2012 - v001c

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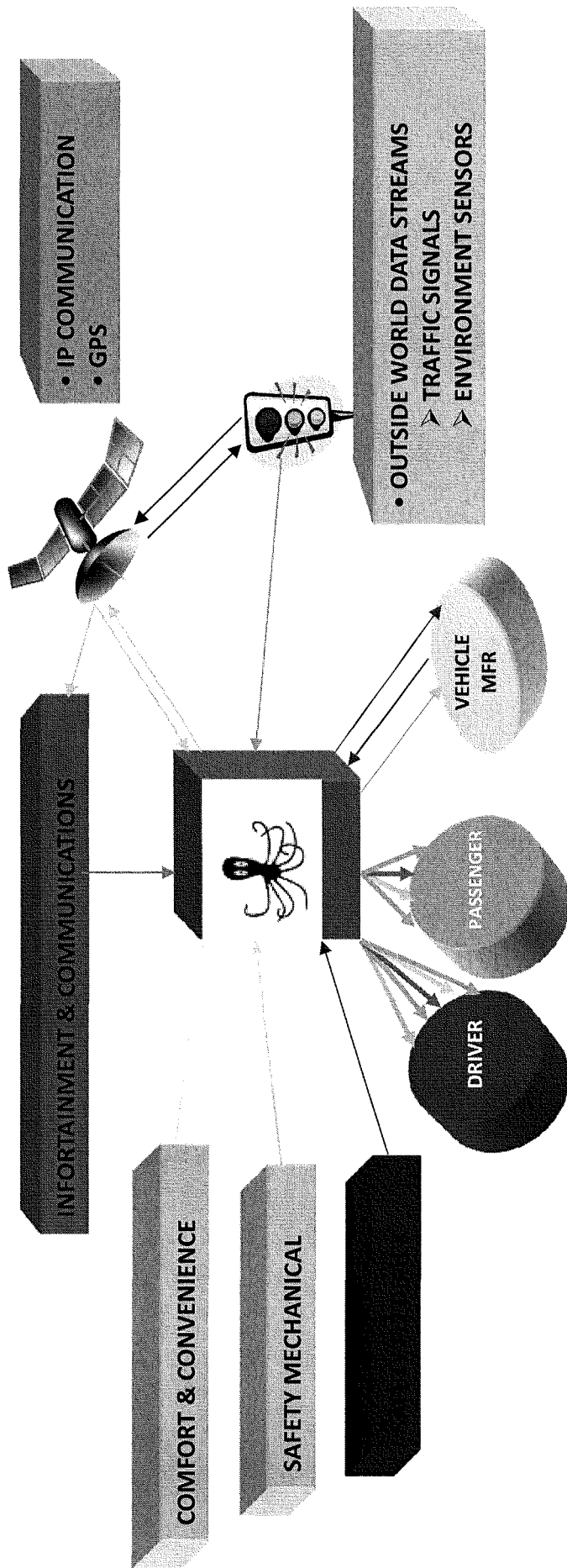


Octopus – The Opportunity

- Simplify and coordinate all data streams
- Enable efficient technology upgrading
- Enable ease of new technology introduction
- Provide industry accepted protocol
- Improve network security
- Limitless potential with cloud based services



Managing Data Streams





Integrating Functionality

- Conceptual Architecture is complete
 - IPv6 based subsystem
 - separates presentation functions from sensor/infotainment systems
 - multiple display systems supported
 - integration of existing sensor systems
 - integration of existing infotainment systems
 - controlled migration to Ethernet-based sensor systems
 - “high availability” options available
 - A foundation for establishing effective cyber attack prevention
- Physical “Box”
 - EMI sealed
 - gasketed connector panel for “customization” by car company
 - return to depot maintenance
- Regulatory Compliance Opportunities
 - Event Data Recording, with survivability
 - call/text control functionality



Why This Approach?

- Follows the technology curve
 - IPv6 will dominate connections to “any” device
 - “x”Gb/sec Ethernet will dominate connectivity
 - software uses “Class Driver”
 - separates “function” from underlying hardware
 - simplifies migration from existing sensor systems to “NexGen” sensor
- Multiple IP sources for connectivity
 - mobile “phone company”
 - independent suppliers of 3G/4G/LTE
 - Lightsquared /Airbiquity “wholesale” networks
 - car company “service” offerings
 - “ISP” service offerings
 - WiMax supplier (Clear)
- Supports multiple technology suppliers – greater flexibility
 - Intel/Wind River
 - TI OMAP
 - Android/RT Linux
- Provides efficient software and feature upgrading of vehicle



Next Steps

- Product Brochure
 - “glossy” 4 page overview
 - system diagrams
- Preliminary System Architecture “white paper”
- “IP” disclosures



Help Needed

- “face time” with Flextronics Auto System Architects
- Production assistance for product brochure

Electronic Patent Application Fee Transmittal

Application Number:

Filing Date:

Title of Invention:

COMPLETE VEHICLE ECOSYSTEM

First Named Inventor/Applicant Name:

Christopher P. Ricci

Filer:

Douglas W. Swartz/Christine Jacquet

Attorney Docket Number:

6583-164-PROV-3

Filed as Large Entity

Provisional Filing Fees

Description

Fee Code

Quantity

Amount

**Sub-Total in
USD(\$)**

Basic Filing:

Provisional application filing

1005

1

250

250

Pages:

Claims:

Miscellaneous-Filing:

Petition:

Patent-Appeals-and-Interference:

Post-Allowance-and-Post-Issuance:

Extension-of-Time:

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				250

Electronic Acknowledgement Receipt

EFS ID:	13087024
Application Number:	61663335
International Application Number:	
Confirmation Number:	8124
Title of Invention:	COMPLETE VEHICLE ECOSYSTEM
First Named Inventor/Applicant Name:	Christopher P. Ricci
Customer Number:	22442
Filer:	Douglas W. Swartz/Christine Jacquet
Filer Authorized By:	Douglas W. Swartz
Attorney Docket Number:	6583-164-PROV-3
Receipt Date:	22-JUN-2012
Filing Date:	
Time Stamp:	17:11:52
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$ 250
RAM confirmation Number	4428
Deposit Account	191970
Authorized User	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Provisional Cover Sheet (SB16)	ProvCoverSheet.pdf	2071224	no	3
			965ac06dfd48a320cbe03a7a019eab6731dc7ec3		

Warnings:**Information:**

2	Specification	ProvAppWithDrawings.pdf	5263919	no	53
			d75765c6eafed4fd17f34bf4e6acc2e4d17e7566		

Warnings:**Information:**

3	Appendix to the Specification	ExhibitsA-C.pdf	12654810	no	47
			aa4b61d9de2673c228be4ac49065626d2f3f33e9		

Warnings:**Information:**

4	Fee Worksheet (SB06)	fee-info.pdf	29832	no	2
			94b0418cf85f5f0e897a0113b36dd213f570b2bf		

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Total Files Size (in bytes):			20019785		
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National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
61/663,335	06/22/2012		250	6583-164-PROV-3		

CONFIRMATION NO. 8124

22442
Sheridan Ross PC
1560 Broadway
Suite 1200
Denver, CO 80202

FILING RECEIPT



OC000000055239292

Date Mailed: 07/09/2012

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Christopher P. Ricci, Saratoga, CA;

Power of Attorney:

Douglas Swartz--37739

If Required, Foreign Filing License Granted: 07/06/2012

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 61/663,335**

Projected Publication Date: None, application is not eligible for pre-grant publication

Non-Publication Request: No

Early Publication Request: No
Title

COMPLETE VEHICLE ECOSYSTEM

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international

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APPLICATION NUMBER	PATENT NUMBER	GROUP ART UNIT	FILE WRAPPER LOCATION
61/663,335			



Correspondence Address/Fee Address Change

The following fields have been set to Customer Number 111285 on 12/10/2012

- Correspondence Address
- Maintenance Fee Address

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1560 Broadway
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