A hotel mobile device is disclosed. The hotel device is the guest's interface to their room, entertainment, hotel and concierge services; and a hotel's path to desirability, revenue, brand control and efficiency. Hotels may distribute the mobile device to their guests upon check-in, and/or guests may install a software application (app) to their personal mobile device(s). The mobile device can be used across multiple hotels. The mobile device is advantageous because it is personalizable, has an improved/enhanced and consistent experience across properties, and has other travel-based features that don't require a hotel stay.
CROSS-REFERENCES TO RELATED APPLICATION

[0001] The present application claims priority to U.S. Provisional Application No. 61/541,000, filed September 29, 2011, and entitled "Systems, Methods And Mobile Devices That Allow Hotel Guests To Interface With The Hotel Via The Mobile Device," the entirety of which is hereby incorporated by reference.

FIELD OF THE DISCLOSURE

[0002] The subject invention relates to methods, network systems, electronic devices, and mobile devices that allow a hotel guest to interface with a hotel.

BACKGROUND OF THE DISCLOSURE

[0003] The hotel industry, serving millions of travelers each year, has become increasingly reliant on networking and server technology to service its guests. Increasingly, hotels rely on discrete servers and systems for its different services. This fragmentation is cumbersome for the hotels themselves to manage, but it is worse still for the guests.

[0004] Guests at hotels are faced with different systems and devices for each of the different aspects of a stay at a hotel. Under the current system, a hotel guest might look up hotel rates using a search engine, a hotel aggregator, or the hotel's own website. If the guest has a rewards program, they will need to navigate that site as well and decide how to use those points on one of the other website. To book a room, they could use the internet or call on the telephone. When the guest arrives at the hotel, they will need to go to the front desk where they hope they are found on the hotel's computer system. They are then given a key or have key card made for their hotel room.

[0005] Once the guest has begun their stay, if they need a hotel service, they will need to navigate the hotel phone system to try to reach the front desk. If they want to change the temperature of their room they will have to find the thermostat. If they want to watch television
or a movie they will have to navigate an increasingly complicated entertainment system. After dealing with all these unique systems, they will again have to return to the front desk to check out. In short, the current systems used in the hotel industry have become increasingly difficult for a guest to use, since they face the challenge of understanding a different system at every step.

[0006] The current state of the art also is less than optimal for the hotel chains and property managers themselves. With so many systems, it can be difficult to keep all the systems serviced. The data from these systems, which provides invaluable guest information, called analytics, such as preferences, habits, and other personal information, is difficult to obtain and integrate amongst so many systems.

SUMMARY OF THE DISCLOSURE

[0007] This disclosure is directed at a system which integrates many or all of a hotel's services into a single server or cloud based system which connects directly with an electronic device to communicate with a guest.

[0008] In some embodiments, this is accomplished by providing the user with an application (app) to run on either their own mobile phone or device or one provided them for this purpose. The app communicates directly with a server (located in the hotel or in an Internet cloud) and will give the user a unified experience where many tasks can be accomplished via a single interface. The system will also give the hotel the simplicity of a single, integrated system replacing many of the discrete systems in place at hotels today.

[0009] In some embodiments, a user can be given a mobile phone by the hotel to use for their stay, or will provide their own mobile phone. An app is installed on the phone (or other mobile device, such as Wi-Fi player or tablet) which communicates with the hotel's server through a network protocol to accomplish many different tasks related to their stay. In some embodiments, for example, the application can direct the server to book the guest at a hotel and to manage their payment remotely. In some embodiments, the user can then use the phone to check into the hotel remotely. In one embodiment, the phone itself can use Near Field Communications (NFC) to operate as door key and can unlock the user's hotel room after communicating with the server to that they are currently booked there.
[0010] The user can then use the phone to handle many, or all, of the systems in the hotel room once their stay has begun, using the phone application to communicate with the central server, which itself communicates with the hotel's devices and systems. For example, in some embodiments, the application will be able to adjust the temperature settings of a networked thermostat in the room. In some embodiments the system can be used to adjust the lights or the position of the curtains, or any other device which is attached to the hotel network or the internet. In some embodiments, the application can also serve to provide information about the hotel property or the local area. This same system may then be used book hotel or local services, such as room service, reservations, or tickets for a show.

[0011] In some embodiments, the application provided to the user is based on a modular graphical user interface which can be customized to the hotel property and to the local area. In some embodiments, this customization can occur automatically based on the user's proximity to hotel services or based on the timing of a known booking.

[0012] In some embodiments, the application can be run from a permanently installed device in the user's hotel room or in other fixed locations. These stations, because they are connected via the server to many of the room's devices, can be a unified control point for the rooms many settings and the hotels many services. This station can stand alone, or in some embodiments, this station can act in parallel with the application on the user's mobile device. In some embodiments, this station can even serve as a charging dock for the mobile device by providing the appropriate power connector.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] The accompanying drawings, which are incorporated in and constitute a part of this specification, exemplify the embodiments of the present invention and, together with the description, serve to explain and illustrate principles of the invention. The drawings are intended to illustrate major features of the exemplary embodiments in a diagrammatic manner. The drawings are not intended to depict every feature of actual embodiments nor relative dimensions of the depicted elements, and are not drawn to scale.
FIG. 1 shows a schematic functional block diagram of an electronic device used to run an application providing access to a server in order for a guest at a hotel to perform travel related tasks.

FIG. 2 shows a schematic functional block diagram of an overview of a system providing a user access to a server which is connected to a number of other devices and services allowing the user to access a number of different systems and resources.

FIG. 3 shows a flow chart of a method by which the server enacts requests by a hotel guest using an electronic device to access the server.

FIG. 4 shows a schematic functional block diagram of the system shown in FIG. 2 with many of the elements shown in greater detail.

**DETAILED DESCRIPTION**

Various examples of the invention will now be described. The following description provides specific details for a thorough understanding and enabling description of these examples. One skilled in the relevant art will understand, however, that the invention may be practiced without many of these details. Likewise, one skilled in the relevant art will also understand that the invention can include many other obvious features not described in detail herein. Additionally, some well-known structures or functions may not be shown or described in detail below, so as to avoid unnecessarily obscuring the relevant description.

The terminology used below is to be interpreted in its broadest reasonable manner, even though it is being used in conjunction with a detailed description of certain specific examples of the invention. Indeed, certain terms may even be emphasized below; however, any terminology intended to be interpreted in any restricted manner will be overtly and specifically defined as such in this Detailed Description section.

It will be apparent to those of ordinary skill in the art that although the systems and methods of this invention are often embodied in this description as applying to hotels, hotel rooms, and hotel guests, that the same systems and methods can be applied to other fields as well, and that the use in this document of these terms is used for simplicity rather than as a limitation of the scope of the invention. For instance, in one embodiment, the system in this invention whereby a user uses a mobile device to unlock a door, is an invention not just for
hotels but for any structure using locking doors, such as homes, condominiums, apartment complexes, cruise ships, office buildings or other structures or businesses. Likewise, all of the devices, methods, and systems herein described can be used for any of these businesses and locations as well. Therefore the terms hotel, hotel room, and guest should not be read as limiting the scope of this invention to the hospitality industry.

The following discussion provides a brief, general description of a representative environment in which the invention can be implemented. Although not required, aspects of the invention may be described below in the general context of computer-executable instructions, such as routines executed by a general-purpose data processing device (e.g., a server computer or a personal computer). Those skilled in the relevant art will appreciate that the invention can be practiced with other communications, data processing, or computer system configurations, including: wireless devices, Internet appliances, hand-held devices (including personal digital assistants (PDAs)), wearable computers, all manner of cellular or mobile phones, multi-processor systems, microprocessor-based or programmable consumer electronics, set-top boxes, network PCs, mini-computers, mainframe computers, and the like. Indeed, the terms "controller," "computer," "server," "electronic device" and the like are used interchangeably herein, and may refer to any of the above devices and systems.

While aspects of the invention, such as certain functions, are described as being performed exclusively on a single device, the invention can also be practiced in distributed environments where functions or modules are shared among disparate processing devices. The disparate processing devices are linked through a communications network, such as a Near Field Communications (NFC) link, Local Area Network (LAN), Wide Area Network (WAN), or the Internet. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

Aspects of the invention may be stored or distributed on tangible computer-readable media, including magnetically or optically readable computer discs, hard-wired or preprogrammed chips (e.g., EEPROM semiconductor chips), nanotechnology memory, biological memory, or other data storage media. Alternatively, computer implemented instructions, data structures, screen displays, and other data related to the invention may be distributed over the Internet or other networks (including wireless networks), on a
propagated signal on a propagation medium (e.g., an electromagnetic wave(s), a sound wave, etc.) over a period of time. In some implementations, the data may be provided on any analog or digital network (packet switched, circuit switched, or other scheme).

[0024] In some instances, the interconnection between modules is the internet, allowing the modules (with, for example, Wi-Fi capability) to access web content offered through various web servers. The network may be any type of cellular, IP-based or converged telecommunications network, including but not limited to Global System for Mobile Communications (GSM), Time Division Multiple Access (TDMA), Code Division Multiple Access (CDMA), Orthogonal Frequency Division Multiple Access (OFDM), General Packet Radio Service (GPRS), Enhanced Data GSM Environment (EDGE), Advanced Mobile Phone System (AMPS), Worldwide Interoperability for Microwave Access (WiMAX), Universal Mobile Telecommunications System (UMTS), Evolution-Data Optimized (EVDO), Long Term Evolution (LTE), Ultra Mobile Broadband (UMB), Voice over Internet Protocol (VoIP), Unlicensed Mobile Access (UMA), etc.

[0025] FIG. 1 is a schematic view of an illustrative electronic device for providing an application operative to interface with a hotel system in accordance with some embodiments of the invention. Electronic device 100 can include control circuitry 102, storage 104, memory 106, I/O circuitry 108, and communications circuitry 110. In some embodiments, one or more of the components of electronic device 100 can be combined or omitted. In some embodiments, electronic device 100 can include other components not combined or included in those shown in FIG. 1 (e.g., motion detection components, a power supply such as a battery or kinetics, a display, a bus, a positioning system, or an input mechanism), or several instances of the components shown in FIG. 1. For the sake of simplicity, only one of each of the components is shown in FIG. 1.

[0026] Electronic device 100 can include any suitable type of electronic device. For example, electronic device 100 can include a portable electronic device that the user may hold in his or her hand, such as a digital media player, a personal e-mail device, a personal data assistant (“PDA”), a cellular telephone, a handheld gaming device, and a digital camera. As another example, electronic device 100 can include a larger portable electronic device, such as a laptop computer. As yet another example, electronic device 100 can include a substantially fixed electronic device,
such as a desktop computer or a docking station. Preferably, electronic device 100 is a smartphone, such as an Google Android based smartphone from Samsung Corporation (i.e. Samsung Galaxy S III) or an Apple iOS based smartphone from Apple Corporation (i.e. Apple iPhone 5).

Control circuitry 102 can include any processing circuitry or processor operative to control the operations and performance of electronic device 100. For example, control circuitry 102 can be used to run operating system applications, firmware applications, media playback applications, media editing applications, or any other application. In some embodiments, control circuitry 102 can drive a display and process inputs received from a user interface.

Storage 104 can include, for example, one or more storage mediums including a hard-drive, solid state drive, flash memory, permanent memory such as ROM, any other suitable type of storage component, or any combination thereof. Storage 104 can store, for example, media data (e.g., music and video files), application data (e.g., for implementing functions on electronic device 100), firmware, user preference information data (e.g., media playback preferences), authentication information (e.g. libraries of data associated with authorized users), lifestyle information data (e.g., food preferences, exercise information data (e.g., information obtained by exercise monitoring equipment), transaction information data (e.g., information such as credit card information), wireless connection information data (e.g., information that can enable electronic device 100 to establish a wireless connection), subscription information data (e.g., information that keeps track of podcasts or television shows or other media a user subscribes to), contact information data (e.g., telephone numbers and email addresses), calendar information data, and any other suitable data or any combination thereof.

Memory 106 can include cache memory, semi-permanent memory such as RAM and/or one or more different types of memory used for temporally storing data. In some embodiments, memory 106 can also be used for storing data used to operate electronic device applications, or any other type of data that can be stored in storage 104. In some embodiments, memory 106 and storage 104 can be combined as a single storage medium.

I/O Circuitry 108 can be operative to convert (and encode/decode, if necessary) analog signals and other signals into digital data. In some embodiments, I/O circuitry 108 can also convert digital data into any other type of signal, and vice-versa. For example, I/O circuitry
108 can receive and convert physical contact inputs (e.g., from a multi-touch screen), physical movements (e.g., from a mouse or sensor), analog audio signals (e.g., from a microphone), or any other input. The digital data can be provided to and received from control circuitry 102, storage 104, memory 106, or any other component of electronic device 100. Although I/O circuitry 108 is illustrated in FIG. I as a single component of electronic device 100, several instances of I/O circuitry 108 can be included in electronic device 100.

[0031] Electronic device 100 can include any suitable interface or component for allowing a user to provide inputs to I/O circuitry 108. For example, electronic device 100 can include any suitable input mechanism, such as for example, a button, keypad, dial, a click wheel, or a touch screen. In some embodiments, electronic device 100 can include a capacitive or resistive sensing mechanic, or a multi-touch capacitive sensing mechanism.

[0032] In some embodiments, electronic device 100 can include specialized output circuitry associated with output devices such as, for example, one or more audio outputs. The audio output can include one or more speakers (e.g., mono or stereo speakers) built into electronic device 100, or an audio component that is remotely coupled to electronic device 100 (e.g., a headset, headphones or earbuds that can be coupled to communications device with a wire or wirelessly).

[0033] In some embodiments, I/O circuitry 108 can include display circuitry (e.g., a screen or projection system) for providing a display visible to the user. For example, the display circuitry can include a screen (e.g., an LCD screen) that is incorporated in electronics device 100. As another example, the display circuitry can include a movable display or a projecting system for providing a display of content on a surface remote from electronic device 100 (e.g., a video projector). In some embodiments, the display circuitry can include a coder/decoder (Codec) to convert digital media data into analog sials. For example, the display circuitry (or other appropriate circuitry within electronic device 100) can include video Codecs, audio Codecs, or any other suitable type of Codec.

[0034] The display circuitry also can include display driver circuitry, circuitry for driving display drivers, or both. The display circuitry can be operative to display content (e.g., media playback information, application screens for applications implemented on the electronic device, information regarding ongoing communications operations, information regarding incoming communications requests, or device
operation screens) under the direction of control circuitry 102. Alternatively, the display circuitry can be operative to provide instructions to a remote display.

[0035] Communications circuitry 110 can include any suitable communications circuitry operative to connect to a communications network and to transmit communications (e.g., voice or data) from electronic device 100 to other devices within the communications network. Communications circuitry 110 can be operative to interface with the communications network using any suitable communications protocol such as, for example, Wi-Fi (e.g., a 802.11 protocol), Bluetooth®, radio frequency systems (e.g., 900 MHz, L4 GHz, and 5.6 GHz communication systems), infrared, GSM, GSM plus EDGE, CDMA, quadband, and other cellular protocols, VOW, Near Field Communications (NFC), or any other suitable protocol.

[0036] In some embodiments, communications circuitry 110 can be operative to create a communications network using any suitable communications protocol. For example, communications circuitry 110 can create a short-range communications network using a short-range communications protocol to connect to other devices. For example, communications circuitry 110 can be operative to create a local communications network using the Bluetooth® protocol to couple electronic device 100 with a Bluetooth® headset.

[0037] Electronic device 100 can include one more instances of communications circuitry 110 for simultaneously performing several communications operations using different communications networks, although only one is shown in FIG. 1 to avoid overcomplicating the drawing. For example, electronic device 100 can include a first instance of communications circuitry 110 for communicating over a cellular network, and a second instance of communications circuitry 110 for communicating over Wi-Fi or using Bluetooth®. In some embodiments, the same instance of communications circuitry 110 can be operative to provide for communications over several communications networks.

[0038] In some embodiments, electronic 100 can be coupled to a host device for data transfers, synching the communications device, software or firmware updates, providing performance information to a remote source (e.g., providing riding characteristics to a remove server) or performing any other suitable operation that can require electronic device 100 to be coupled to a host device. Several electronic devices 100 can be coupled to a single host device
using the host device as a server. Alternatively or additionally, electronic device 100 can be
coupled to several host devices (e.g., for each of the plurality of the host devices to serve as a
backup for data stored in electronic device 100).

[0039] In some embodiments, the electronic device 100 is used in a system illustrated in FIG.
2 as a mobile device 200 which can be accessed by a user 50. The term "mobile device" will be
used for convenience, but the device can be either mobile, such as a phone or tablet, or
stationary, such as a desktop computer or other permanent electronic device. Mobile device 200
may include an application 205 operative to interface with a hotel server 210 to provide access to
different services provided by server 210.

[0040] In some embodiments, the user 50 will interact with the application 205 on the mobile
device 200 using the I/O features of the mobile device 200. The mobile device 200
communicates with the server 210 through an appropriate communication protocol. In some
embodiments, the server 210 will be an electronic device as previously described, which exists
either physically at the hotel site, at a remote location, or as part of the cloud as provided by
some businesses scalable server service.

[0041] In some embodiments, the server 210 is coupled with a data storage device 220 to
retain appropriate data related to the use of the server 210 in this invention. For instance, in some
embodiments, the data storage device 220 records and retains data such as reservations which
have been booked through the server or have been imported into the server for the purpose of
determining which users occupy specific rooms in a hotel.

[0042] In some embodiments, the server 210 is connected directly to the internet through an
appropriate internet protocol (IP). The server 210 can access requested data and services which
are not directly coupled to the server by using the internet 230. For instance, the server 210 could
respond to a user 50 request for a local map by accessing the internet 230 and providing the map
or internet search results relating to the request back to the mobile device 200 to be displayed by
the application 205.

[0043] In some embodiments, the server 210 will be coupled directly or by use of an
appropriate network protocol to a number of hotel services 240, to networked devices 250 and/or
to relevant third party services 260.
In some embodiments, networked devices 250 are controlled wirelessly through an appropriate wireless control protocol or through an appropriate network protocol. As explained further in the following paragraphs, any networked or wirelessly controllable device in a user's room can be controlled through the application 205 by the user 50 by sending a request to the server which is connected to the devices or through the mobile device 200 through a local wireless control to the devices directly.

In some embodiments, some or all of the settings and controls listed below can be saved, stored, and accessed by an appropriate data storage means on the mobile device 200, the server 210, or on the internet 230 in a cloud storage device.

Application 205 receives requests from user 50 for some action desired by user 50. Application 205 acts upon such requests by sending a command to server 210. Server 210 determines how to handle the requests. For requests for room service, for example, server 210 would send such a request through the hotel's Property Management System (PMS) or Point of Sale (PoS) system to order the desired items.

For room control services, such as a change in lighting or HVAC (Heating Ventilation and Air Conditioning). In response to such a request, server 210 would issue a command to the room control unit or HVAC system. If these systems are IP (Internet Protocol) based, server 210 would issue a command to the IP address of the device (light, room control unit, HVAC system). If the device is not IP based, an IP based room control unit would accept IP commands from server 210, and translate these commands into signals necessary to communicate with the target device.

In the case where the target device is a ceiling light fixture, a controllable relay device could be inserted in the electrical system to turn the light on and off. If the target device is the HVAC system, such a system might have a serial interface, such as RS232 or Modbus. The IP based room control unit would translate the IP commands from server 210 into the appropriate Modbus commands for the HVAC system.

In some embodiments, the application 205 allows the user 50 to create, access, and store a user account, which associates setting, preferences and personal information as well as any other relevant user data and can be stored on a hotel server, and internet based storage medium, or any other appropriate data storage means which can be connected to a network.
In some embodiments the user 50 will be able to use the application 205 to control the entertainment systems in the room (e.g., television, sound system, gaming system, Electronic Program Guide (EPG), and other IPTV based features). If the in-room entertainment systems are IP based, the server 210, in response to a request from user 50 in application 205 running on mobile device 200, would send the appropriate IP command. For example, to turn on the television or change the channel. Information about the current status of the television, such as what channel is on or the volume can be requested from the television and returned to user 50, through server 210 to application 205 and displayed on mobile device 200. If the entertainment system uses IR (infrared), such as provided by a standard remote control, IP based room control unit would receive the requested command and translate the command to the appropriate IR command and broadcast the IR command using an IR emitter positioned in the room so as to have access to the IR receiver on the entertainment system.

In some embodiments the mobile device 200 can operate as a universal TV remote by having the application 205 display a typical remote layout and controlling the TV by IR transceiver or other local wireless protocol or by an appropriate network protocol through the server 210.

In one embodiment, the mobile device 200 has the application 205 display a layout as a game controller, and could control a game system on the TV through one of the local wireless or network protocols discussed above.

In some embodiments, the mobile device 200 can stream audio or audio/visual content onto the television and/or sound system through a local wireless or network protocol.

In some embodiments the user 50 will be able to use the mobile device 200 to control the lights and lighting systems in the room. In one embodiment the user is able to control each light individually, turning them on or off, or dimming them to the requested level.

In some embodiments the user 50 will be able to use the mobile device 200 to control the air conditioning (AC) unit in the room and/or the curtains. For instance on one embodiment, the user 50 could use the application 205 to set the A/C unit at 68 degrees.

In some embodiments, the networked devices 250 can be controlled in groups. In some embodiments, the application 205 will allow the user 50 to create and store their own custom groups of devices. In addition, the user 50 can control the devices on a delay or at a set
time, for instance the user 50 could set all the lights above the bed to come on with the audio system at 8am to wake up the user 50.

[0057] In some embodiments, the user 50 can create and save a "Mood" which is a group of settings for one or more devices which are performed simultaneously at the user request. For instance a "wake up Mood" might have set the thermostat 70 degrees, set all lights to full on, set the curtains to open, and turn on the television set to a local news station. By accessing the stored Mood in the application 205 or on the server 210, the user 50 can enable all of these systems immediately or can set them to occur at a later time.

[0058] In some embodiments, a setting or group of settings can be saved by the application 205 or server 210 which are later automatically enacted based on a subsequent event. For instance the user can set all lights to turn off whenever the user leaves the room and to turn on whenever they enter.

[0059] In some embodiments, several of the networked systems a 250 above are controlled simultaneously, for instance by have an "all off" setting by which the lights and entertainment system are shut off simultaneously.

[0060] In some embodiments the control of the networked systems 250 above will only be available when the user is in their room, but in other embodiments, the setting will be controllable whenever the mobile device 200 is able to connect to the server 205. For instance the mobile device 200 can be used to set the A/C settings while the user 50 is in a cab on the way to the hotel. This can be achieved using any appropriate communications protocol, for instance a cellular network with data service.

[0061] In one embodiment, the user 50 can use their mobile device 200 to control and/or provide in-room entertainment. For example, the user can control the television, play games on their TV via the mobile device, stream music to in-room stereo, play "Classical" music in the bathroom, see program information of what's playing now and what is coming up, search for a particular program or type of program, etc. Users can search, find, filter, sort, browse, find similar, find recommended, etc. entertainment using the mobile device 200.

[0062] In one embodiment, the mobile device 200 works with both serial / tight integration via hotel mode TVs as well as via IR commands for TVs without a serial / data integration.
For example, some embodiments of the mobile device 200 and application 205 include the ability to: list and select channels by icons; adjust channel order to custom order; set default channel; set default volume, group channels by type; create and store channel favorites; display information about current or future programming, interact with Video On Demand services to display, sort, and select available programming, adjust for local time.

In one embodiment the mobile device 200 can access audio or audiovisual content from internet 230 sources and services such as Hulu™, Netflix™, or Pandora™, either displaying the content on the device itself or through one of the in room entertainment systems.

In one embodiment, the mobile device 200 accesses the sources of program information through a network (e.g., via XML or RSS websites). The mobile device/service provider may be used to program the channels form the hotel line up in a standard manner, search online sources for the channels programmed, retrieve program information for the channels, parse the information into a database, and create a feature to access and display that information on the mobile device. In one embodiment, the server of the service provider includes an API to interface with content provider, authenticate user and account, provide access to available content and to stream content to the TV, control content playback. In one embodiment, the mobile device/server allows for use of proxy servers to access content on per content app basis regardless of location.

In one embodiment, the user may use their mobile device 200 to access services offered by the hotel 240. For example, the mobile device may be used to order room service, make reservations for hotel restaurants, arrange transportation, arrange for laundry to be picked up, provide information about pool hours, provide users with the wireless password for their computer, request housekeeping service, set the "do not disturb" status of their room, etc. The user can access these features on the mobile device 200 from within their room, within the hotel, or external to the hotel.

In some embodiments, one of the networked devices 250 is an electronic door lock and two of the hotel services 240 are the hotel Property Management System (PMS) and a central reservation engine server, allowing the mobile device 200 to act as a room key. The server provides a link between the hotel's Property Management System (PMS) and the mobile device 200 to be able to securely transmit the hotel room and key information software installed
on the mobile device 200. This allows guests to use their own phone equipped with NFC or a mobile device provided by the hotel to act as the room key.

[0068] In some embodiments, the application 205 is based on a modular Graphical User Interface which can be customized to a hotel chain and or to an individual property to accommodate a different set of features turned at the location, the corporate chain, or to the particular room the guest is staying in.

[0069] In some embodiments, the application 205 may be personalized by the user 50. In addition, at the user's discretion, the system may provide customization automatically based on behavior and content choices.

[0070] In one embodiment, the mobile device 200 operates as a telephone. The mobile device 200 can integrate automatic dialing from the interface; using links or "Call" buttons, etc. Key numbers (ie, Hotel services), emergency, and favorites can be accessed using single key entry. For example, the user can use the mobile device 200 to call the hotel operator, call a fellow guest, text a request to the front desk, call home, call local business, check e-mail, access online maps, access information about a sight he / she is visiting, post a photo or comment to Twitter or Facebook while outside of the hotel, surf the Internet, etc. The electronic device may be integrated with the hotel's PBX and/or a local 3G provider.

[0071] In some embodiments, through the use of custom developed IP Telephony on a server designed and provided by the service provider, the server 210 allows guests to use their own phone as an in-room phone extension. For example, in some embodiments, the mobile device 200 allows the user 50 to make local and international calls and access data through 3G and GSM services or other appropriate at local rates through the hotels PMS system.

[0072] In one embodiment, the mobile device 200 interacts with hotel warning systems and display emergency evacuation information and maps.

[0073] In one embodiment, the mobile device 200 provides the hotel with reports on lights that are out or equipment operating inefficiently, etc.

[0074] In one embodiment, the mobile device 200 provides location information to the hotel about a guest so that the hotel can locate user anywhere in the hotel and provide services.

[0075] In one embodiment, the service provider offers a hotel management tool that will allow hotel staff to be able to configure the interface for their hotel.
In one embodiment, the mobile device 200 is a Control Device provided in the room to provide control over the lighting, air-con, curtains, TV and entertainment devices. The control device can receive commands by, for example, TCP/IP, and then turn them into actions based on the various types of interfaces on the device.

In some embodiments, for example, the application 205 can direct the server to book the guest at a hotel and to manage their payment remotely.

In some embodiments, the invention consists of the method to accomplish the tasks which the user initiates as illustrated in FIG. 3. The server first receives a command 300 by an electronic device over an appropriate network protocol 310. The server then identifies the appropriate connected system or data storage device 320, and then either enacts the requested command 340 or acquires the appropriate data 360. Once this is accomplished the server responds 380 by sending either a confirmation or the requested data back to the electronic device.

In embodiments where the application 205 is installed on the user's own phone, the application 205 allows guests to use their mobile device across multiple hotels. The application installed on a guest's own mobile device may be advantageous because guests can personalize the interface; guests will experience an improved/enhanced and consistent experience across properties, and will have access to optional travel-based features that don't require a hotel stay.

FIG. 4 is a diagram of a of an embodiment of the invention which is the same as in FIG. 2 and the description above, but goes into greater detail for some of the aspects of the invention. The system in FIG. 4 is one configuration of the invention, but other configurations exist. Other configurations may contain additional equipment and systems or may lack some equipment or systems shown in FIG. 4. FIG. 4 in no way limits the invention to this particular configuration shown and described below; it merely uses the configuration to assist an understanding of one way the invention can be implemented.

The server 210 from FIG. 2 above can be, as previously stated, a single server or multiple servers working in parallel or in sequence, as shown in the servers 410 box of FIG. 4. As shown in the diagram, in the embodiment the server system used can contain some, all, or two or more of each of: a routing/security server 412, a cloud-based server 414, and an on-site server 416.
In the shown configuration, in some embodiments, the routing/security server 412 acts as a routing and access server which the users of the system access first when using the system. The routing/security server 412 may be the only server which the user can access preliminarily, but then once the user has been processed by the routing/security server 412, the user can access further servers and systems. The purpose of this system is to provide logistics and security to the system. For example, the applications and devices which need to access the system will only need the address of the routing/security server 412, which can then route them to the other systems, rather than having to have the addresses and access information of all possible servers from the start. Additionally, by keeping those IP addresses and access info off of the applications and devices accessible by the users, the security of the system is improved by helping to prevent unwanted access to the other servers and systems. Additionally, since the devices communicate through the routing/security server often, this server can be used to provide support and push software updates to the individual systems which connect to it.

In some embodiments, there may be one or more of either or both of: cloud based server 414 or on site server 416. Cloud-based server 414 can exist at any offsite location which has internet access, or can exist at many sites. On-site server 416 can be located at or adjacent to the business which is using it, and is therefore on the property 440 of the business. Additionally, the invention contemplates that many of the configurations will use either both of these systems and/or several of one or the other in parallel. The purpose of this parallel operation is to distribute the load of user access and to add a layer of redundancy in case one of the servers is for some reason unable to operate.

In some embodiments the property 440 will contain some or all of the diagramed systems in FIG. 4, such as a Property Management System (PMS) 442, a Point of Sale (POS) system 444, a PABX or IP telecommunication system 446, and/or other systems 448 such as security, IPTV, CCTC, etc. In some embodiments, these systems will be connected to the Severs 410 via an appropriate network protocol in order to foster access to those systems by users and to allow control and data collection of the systems by the centralized servers. In other embodiments, some or all of these systems can be replaced or supplemented by the centralized server system. For example, the PABX telecommunication system 446 can be replaced by an on-site server 416 or cloud-based server 414 which is configured to run Voice over IP (VoIP) or
other network based telecommunications software to supplement or replace a physical PABX telecommunications system. Similarly, in some embodiments, some or all of the listed or other systems can be supplemented or replaced by a server based equivalent.

[0085] In addition to the major on property systems explained above, individual rooms, units, or offices will, in some embodiments, contain various room specific devices and systems which are integrated into the system via an appropriate network protocol or other electronic connection. In some embodiments, some or all rooms/units/offices may contain one or more: room control devices, relay boards, guest communication centers, and other IP devices such as televisions, Apple TV™, or other appliances with network connectivity.

[0086] The room control device can be used to adapt any electronic device, such as lights, thermostats, or entertainment systems in a room to be controlled by the server or systems in this invention. The purpose of the room control device is to allow the system to control a device which does not already have a means of network control built in, or devices whose current control means do not or cannot connect directly to the system. The room control device, in some embodiments, has a means of connecting to a network, either through a wired or wireless protocol, and a way of communicating and controlling a particular in room device, such as a serial, modbus, or other communication protocol.

[0087] For systems which cannot be controlled by a communications protocol, the room control device can be connected to a relay board to allow control of systems by directly controlling their power. The relay board has, in some embodiments, a communications protocol for connecting to the room control device and an electronic relay for providing power to the connected device. For instance, the relay board can be used to provide power to a light or group of lights, and therefore allow the system to control those lights by telling the room control device to have the relay board provide more or less power to the lights.

[0088] The guest communication center (GCC) is used, in some embodiments, to allow a non-mobile access point to the servers in a room, unit, or office, in order to allow a user to access the system envisioned in this invention to control devices or accomplish other tasks. The GCC may have a means of communicating via an appropriate network protocol to the servers, to allow a user access, and to tell relay to the server commands from the user or they may also exercise direct control over some individual systems of the room which are directly
connected to the GCC 456. The purpose of this system is to allow a user control over some or all of the systems in the room or the property without using a mobile device or a personal computer.

[0089] In addition to the room control device 452, relay board 454, and GCC 456, which can be installed specifically to be a part of the current invention, there are many devices available on the market which have IP communications protocol, and can therefore be directly linked to and controlled by the server 410 in each individual room, unit, or office 450. For instance many televisions now have internet connectivity and can be controlled via a network protocol by design. These devices can be integrated into the system with a control device 452 or GCC 456 or directly without use of an additional room control device 452 or GCC 456 via their chosen network protocol and a provided network connection.

[0090] In addition to the system control devices above, in some embodiments the various connected devices may have means of control independent of the system in FIG. 4, such as light switches which work in parallel or in concert with the envisioned system in FIG. 4.

[0091] In FIG. 4, there are three boxes which show three classes of user which the system contemplates in some embodiments: corporate or business users 420, invention system service providers 430, and guest/resident users 460.

[0092] Corporate or business users 420 can be broken into several broad categories: Corporate brand users 422, property management 424, distributors 426, and 3rd party content suppliers 428.

[0093] Corporate brand users 422 are entities such as corporations owning or managing chains of hotels or corporate franchises representing chains, or other corporate entities dealing with one or more properties. The invented system allows these entities access to a number of useful tools and systems which can augment or replace many of their currently un-integrated systems.

[0094] On one embodiment, the corporate brand users 422 can access the servers 410 and retrieve data from the system relating to guests, properties and systems. For instance guest data related to a stay, such as bookings, purchases, and even information such as room preferences and entertainment choices can be used to better serve that guest and can be collected and used for analytics to offer a guest relevant advertisements. Analytics from this data could also be used to improve the corporate brand by identifying data and trends relevant to corporate management,
such as what type of guest is booking what rooms, or what entertainment is popular at which locations, aiding corporate decision making.

In some instances, corporate brand users 422 may replace one or more of their current internet servers or systems, or can integrate those other systems into the invented system by running software on the server 410 which replaces or communicates with these other systems. For instance, the corporate brand user 422 could use the system connect via network protocol to separate server containing the corporate loyalty rewards program. For example, using the server 410, the corporate brand user 422 could collect data from the system for analytics, and/or could use the servers 410 to connect the loyalty rewards server to other systems such as a local POS system 444 allowing reward points to be earned or spent from directly at a specific property. Additionally, some corporate users may choose to use the servers 410 to host their loyalty rewards program directly, eliminating the need for a separate system. Other systems that can be augmented or replaced are also contemplated, such as reservation systems, corporate websites and intra-corporate communication, etc.

Property managers 426 can also interface with the contemplated system and receive similar benefits as the corporate brand users 422, and additionally can use the system for property-specific purposes. In addition to the uses above for corporate brand users 422, all of which can be used by the property managers 424, property specific systems such as the PMS and POS systems can be integrated as discussed earlier.

Another contemplated corporate or business user 420 is the equipment and system distributor 426. The distributor is the entity which manufactures and/or distributes equipment and service related to the installation and maintenance of the whole or some part of the system envisioned. The distributor 426 can, in some embodiments, use the system for analytics and maintenance, for example checking to see if each of the systems is working properly, or of some component has reporting a problem to the server. In this way the distributor can address problems from data provided by the servers 410 directly, or through the other corporate users 420, or the invention system service providers 430.

In some embodiments, there are additional 3rd party content suppliers 428 which also may access the system. For instance, if the system is providing entertainment for property, such as internet radio, the 3rd party content supplier 428 can use the servers 410 to accomplish this.
Additionally, the 3rd party content can be additional services or advertisements to the guest or resident 460, such as hotel booking through a service such as Priceline™ or advertisement and booking of a local cab service near the property, or any of the many other businesses which the user or business would benefit by access to the system.

[0099] In some embodiments, there is an invention system service provider (ISSP) 430 which oversees and supports some or all of the contemplated system, or the aspects of the system which are unique to an individual brand or property. The ISSP can offer the other users product support 432, customer service support 434, and/or a call center 436, etc.

[00100] As discussed earlier in FIG. 2, the system is designed to be used also by an end user, often a guest or resident 460 of an individual room, unit, or office. This user 460 can access the system by a smartphone 462, which is either provided by the property management or the user, which is running an application 464 designed as explained extensively above.

[00101] Additionally, as explained above, the guest or resident 460 can access any of the systems or services using a web browser 468 on any browser capable networked electronic device.

[00102] It should be understood that processes and techniques described herein are not inherently related to any particular apparatus and may be implemented by any suitable combination of components. Further, various types of general purpose devices may be used in accordance with the teachings described herein. It may also prove advantageous to construct specialized apparatus to perform the method steps described herein. The present invention has been described in relation to particular examples, which are intended in all respects to be illustrative rather than restrictive. Those skilled in the art will appreciate that many different combinations of hardware, software, and firmware will be suitable for practicing the present invention.

[00103] Moreover, other implementations of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. Various aspects and/or components of the described embodiments may be used singly or in any combination. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.
CLAIMS

What is claimed is:

1. An electronic system comprising:
   - One or more servers;
   - an application which can communicate with the server or servers, allowing the user of the application to access data and services;
   - a user interface to allow a user of the apparatus to access the hotel management service; and
   - an electronic device which is used to run the application and display the user interface, having an input to allow the user to communicate with the server and an output to allow the server to communicate with the user.

2. The system of claim 1, wherein application is configured to be a room key via the hotel management service accessed through the user interface.

3. The system of claim 1, wherein the apparatus is the user's cellular telephone and wherein the user downloads software to the cellular telephone that includes the user interface and that provides access to the hotel management service.

4. The system of claim 1, wherein the apparatus is a mobile device provided to the user at the hotel.

5. The system of claim 1, wherein the server retains user data on a data storage medium.

6. A method comprising:
   - receiving a command from an application directed by a user;
   - identifying the appropriate system;
directing the appropriate system to enact the command; and responding to the user through the application.

7. The method of claim 6, wherein the application operates on a mobile device.

8. The method of claim 6, wherein the appropriate system is a room control system.

9. The method of claim 6, wherein the appropriate system is a property management system.

10. The method of claim 6, wherein the appropriate system is a point of sale system.

11. The method of claim 6, wherein the appropriate system is a telecommunication system.

12. A communication system comprising:
   a server for receiving, processing and transmitting user commands;
   an application for receiving commands from said user and transmitting said user command to said server; and
   target device for receiving said user command from said server and executing said user command.

13. A communication system according to claim 12, where the server comprises a computer on which an operational application operates.

14. A communication system according to claim 12, where the application is a smartphone running on app.
15. A communication system according to claim 12, where the application is a smartphone running on app.

16. A communication system according to claim 12, where the application is a mobile device running on app.

17. A communication system according to claim 12, where the application is a computer running a web browser.

18. A communication system according to claim 12, where the target device is a room control device.

19. A communication system according to claim 12, where the target device is a property management system.

20. A communication system according to claim 12, where the target device is a point of sale system.

21. A communication system according to claim 12, where the server is local server co-located with the target device.

22. A communication system according to claim 12, where the server is cloud-based server remote from the target device.

23. A communication system according to claim 12, where the server is local server co-located with the target device, and mirrored by a cloud based server.

24. A communication system according to claim 12, where the server is cloud-based server remote from the target device, and mirrored by a local based server.
25. A communication system according to claim 12, wherein the server comprises global server and a target device dedicated server, wherein the application initially communicates with the global server to learn how to contact the target device dedicated server.

26. A communication system according to claim 25, wherein the global server comprises cloud based server.

27. A service control systems comprising:
   a server for receiving, processing and transmitting user commands;
   an application for receiving commands from said user and transmitting said user command to said server; and
   target device for receiving said user command from said server and executing said user command.
INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/058134

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06Q 10/00 (2012.01)
USPC - 705/5

According to International Patent Classification (IPC) or to both national classification and IPC

B. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 2003/0208386 A1 (BRONDRUP) 06 November 2003 (06.11.2003) entire document.</td>
<td>1, 2, 5-13, 16, 18-20, 27</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3-4, 14, 15, 17, 21-26</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:
  "A" document defining the general state of the art which is not considered to be of particular relevance
  "E" earlier application or patent but published on or after the international filing date
  "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  "O" document referring to an oral disclosure, use, exhibition or other means
  "P" document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

1 member of the same patent family

Date of the actual completion of the international search
15 November 2012

Date of mailing of the international search report
30 NOV 2012

Name and mailing address of the ISA/US
Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450
Facsimile No. 571-273-3201

Authorized officer:
Blaine R. Copenheaver
PCT Hqpsdept: 571-272-4200
PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)