

CUSTOMER IDENTIFICATION AND REGISTRATION DEVICE

Priority Statement

[0001] The present application hereby claims priority to Indian patent application number 2291/CHE/2015 filed May 6, 2015, the entire contents of which are hereby incorporated herein by reference.

Field

[0002] At least one embodiment of the invention relates generally to customer identification and registration devices for a variety of commercial establishments such as retail stores, hospitals, banks and so forth. More particularly at least one embodiment of the invention relates to a device for customer identification and registration using wireless communication networks.

Background

[0003] Wireless communication networks are known and are in use. There are several wireless communication technologies that are available such as Wi-Fi. Typically, the Wi-Fi communication capability is used within a closer range of a Wi-Fi access point or source of Wi-Fi communication. Example ranges of operation are from about fifty to several hundred meters.

[0004] Several technologies and/or systems are available to identify a customer in environments such as retail stores. Many of such techniques utilize wireless communication networks for identification of customers. Examples of such technologies include global positioning system (GPS), near field communication (NFC), radio frequency identification (RFID), Bluetooth beacons, active badges and the like. However, the use of these technologies often requires deployment of specialized hardware in the environment. For example, satellites are required for GPS and special receivers and/or transmitters for active badges.

[0005] Moreover, it is tedious to identify the customer in near real time when the customers spend most of their time indoors and in locations where GPS signal is weak. Also, such techniques require extensive system setup and calibration. Further, data collected using

these systems may not represent accurate information in near real time and hence appropriate recommendations/offers for customers cannot be rolled out based on such data.

SUMMARY

[0006] The following summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

[0007] The inventors have recognized a need for an improved customer identification and registration system that facilitates customer identification and provides near real time data associated with the customer.

[0008] According to some examples of the present disclosure, a customer identification and registration system is provided. The system includes a customer identification and registration device configured to receive a signal from one or more customer communication devices of one or more customers, to detect a media access control (MAC) identification number of each of the one or more customer communication devices. The customer identification and registration device is configured to utilize the MAC identification number of the corresponding customer communication devices to register the one or more customers with the system. The customer identification and registration system includes a host computer communicatively coupled to the customer identification and registration device and configured to generate customer data for the one or more customers based on the detected media access control (MAC) identification number of the corresponding customer communication devices. The customer identification and registration system further includes an analytics engine communicatively coupled to the host computer and configured to receive the customer data, wherein the analytics engine is configured to analyze the customer data and to transmit analyzed data to at least one retail partner associated with the system.

[0009] According to still further examples of the present disclosure, a customer identification and registration system is provided. The system includes a customer identification and registration device configured to receive a signal from a customer communication device of a registered customer, to detect a media access control (MAC)

identification number of the customer communication device of the registered customer. The customer identification and registration system includes a host computer communicatively coupled to the customer identification and registration device and configured to retrieve customer registration data for the registered customer based on the detected media access control (MAC) identification number of the corresponding customer communication device. The customer identification and registration system further includes an analytics engine communicatively coupled to the host computer configured to receive the retrieved customer data and wherein the analytics engine is configured to analyze the customer data and to transmit analyzed data to at least one retail partner associated with the system.

[0010] According to still further examples of the present disclosure, a customer identification and registration device is provided. The customer identification and registration device is configured to be used in an establishment. The customer identification and registration device includes a proximity sensor configured to detect presence of a customer communication device in the establishment and a processing circuitry communicatively coupled to the proximity sensor. The processing circuitry is configured to determine a media access control (MAC) identification number of the customer communication device upon detection of the presence of the customer communication device. The customer identification and registration device also includes a communication interface configured to transmit the media access control (MAC) identification number of the customer communication device to a host computer.

BRIEF DESCRIPTION OF THE FIGURES

[0011] These and other features, aspects, and advantages of the present invention will become better understood when the following detailed description is read with reference to the accompanying drawings in which like characters represent like parts throughout the drawings, wherein:

[0012] FIG. 1 is a block diagram of an example embodiment of a customer identification and registration system, implemented according to aspects of the present technique;

[0013] FIG. 2 is flow chart illustrating one embodiment of a process for identifying and registering a new customer using the system of FIG. 1, implemented according to aspects of the present technique;

[0014] FIG. 3 is flow chart illustrating one embodiment of a process for identifying an existing customer using the system of FIG. 1, implemented according to aspects of the present technique;

[0015] FIG. 4 is an example embodiment of a customer identification and registration device implemented according to aspects of the present technique;

[0016] FIG. 5 is an exploded view of the customer identification and registration device of FIG. 4 implemented according to aspects of the present technique;

[0017] FIG. 6 is an example embodiment of placement of a customer identification and registration device in an establishment, implemented according to aspects of the present technique; and

[0018] FIG. 7 is a block diagram illustrating an example computing device that is arranged for identifying and registering a customer, implemented according to aspects of the present technique.

DETAILED DESCRIPTION OF EXAMPLE EMBODIMENTS

[0019] The drawings are to be regarded as being schematic representations and elements illustrated in the drawings are not necessarily shown to scale. Rather, the various elements are represented such that their function and general purpose become apparent to a person skilled in the art. Any connection or coupling between functional blocks, devices, components, or other physical or functional units shown in the drawings or described herein may also be implemented by an indirect connection or coupling. A coupling between components may also be established over a wireless connection. Functional blocks may be implemented in hardware, firmware, software, or a combination thereof.

[0020] Various example embodiments will now be described more fully with reference to the accompanying drawings in which only some example embodiments are shown. Specific structural and functional details disclosed herein are merely representative for purposes of describing example embodiments. The present invention, however, may be embodied in many alternate forms and should not be construed as limited to only the example embodiments set forth herein.

[0021] Accordingly, while example embodiments of the invention are capable of various modifications and alternative forms, embodiments thereof are shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that there is no intent to limit example embodiments of the present invention to the particular forms disclosed. On the contrary, example embodiments are to cover all modifications, equivalents, and alternatives falling within the scope of the invention. Like numbers refer to like elements throughout the description of the figures.

[0022] Before discussing example embodiments in more detail, it is noted that some example embodiments are described as processes or methods depicted as flowcharts. Although the flowcharts describe the operations as sequential processes, many of the operations may be performed in parallel, concurrently or simultaneously. In addition, the order of operations may be re-arranged. The processes may be terminated when their operations are completed, but may also have additional steps not included in the figure. The processes may correspond to methods, functions, procedures, subroutines, subprograms, etc.

[0023] Specific structural and functional details disclosed herein are merely representative for purposes of describing example embodiments of the present invention. This invention may, however, be embodied in many alternate forms and should not be construed as limited to only the embodiments set forth herein.

[0024] It will be understood that, although the terms first, second, etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another. For example, a first element could be termed a second element, and, similarly, a second element could be termed a first element, without departing from the scope of example embodiments of the present invention. As used herein, the term "and/or," includes any and all combinations of one or more of the associated listed items. The phrase "at least one of" has the same meaning as "and/or".

[0025] Further, although the terms first, second, etc. may be used herein to describe various elements, components, regions, layers and/or sections, it should be understood that these elements, components, regions, layers and/or sections should not be limited by these terms. These terms are used only to distinguish one element, component, region, layer, or section from another region, layer, or section. Thus, a first element, component, region, layer, or section discussed below could be termed a second element, component, region, layer, or section without departing from the teachings of the present invention.

[0026] Spatial and functional relationships between elements (for example, between modules) are described using various terms, including "connected," "engaged," "interfaced," and "coupled." Unless explicitly described as being "direct," when a relationship between first and second elements is described in the above disclosure, that relationship encompasses a direct relationship where no other intervening elements are present between the first and second elements, and also an indirect relationship where one or more intervening elements are present (either spatially or functionally) between the first and second elements. In contrast, when an element is referred to as being "directly" connected, engaged, interfaced, or coupled to another element, there are no intervening elements present. Other words used to describe the relationship between elements should be interpreted in a like fashion (e.g., "between," versus "directly between," "adjacent," versus "directly adjacent," etc.).

[0027] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of example embodiments of the invention. As used herein, the singular forms "a," "an," and "the," are intended to include the plural forms as well, unless the context clearly indicates otherwise. As used herein, the terms "and/or" and "at least one of" include any and all combinations of one or more of the associated listed items. It will be further understood that the terms "comprises," "comprising," "includes," and/or "including," when used herein, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0028] It should also be noted that in some alternative implementations, the functions/acts noted may occur out of the order noted in the figures. For example, two figures shown in succession may in fact be executed substantially concurrently or may sometimes be executed in the reverse order, depending upon the functionality/acts involved.

[0029] Unless otherwise defined, all terms (including technical and scientific terms) used herein have the same meaning as commonly understood by one of ordinary skill in the art to which example embodiments belong. It will be further understood that terms, e.g., those defined in commonly used dictionaries, should be interpreted as having a meaning that is consistent with their meaning in the context of the relevant art and will not be interpreted in an idealized or overly formal sense unless expressly so defined herein.

[0030] Spatially relative terms, such as "beneath", "below", "lower", "above", "upper", and the like, may be used herein for ease of description to describe one element or feature's relationship to another element(s) or feature(s) as illustrated in the figures. It will be understood that the spatially relative terms are intended to encompass different orientations of the device in use or operation in addition to the orientation depicted in the figures. For example, if the device in the figures is turned over, elements described as "below" or "beneath" other elements or features would then be oriented "above" the other elements or features. Thus, term such as "below" can encompass both an orientation of above and below. The device may be otherwise oriented (rotated 90 degrees or at other orientations) and the spatially relative descriptors used herein are interpreted accordingly.

[0031] Portions of the example embodiments and corresponding detailed description may be presented in terms of software, or algorithms and symbolic representations of operation on data bits within a computer memory. These descriptions and representations are the ones by which those of ordinary skill in the art effectively convey the substance of their work to others of ordinary skill in the art. An algorithm, as the term is used here, and as it is used generally, is conceived to be a self-consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of optical, electrical, or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers, or the like.

[0032] It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise, or as is apparent from the discussion, terms such as “processing” or “computing” or “calculating” or “determining” or “displaying” or the like, refer to the action and processes of a computer system, or similar electronic computing device/hardware, that manipulates and transforms data represented as physical, electronic quantities within the computer system’s registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

[0033] At least one embodiment of the present invention is generally directed to a system and method for customer identification and registration for a variety of commercial establishments. Examples of the commercial establishments include hotels, restaurants, wholesale businesses, retail stores, warehouses, storage facilities, banks, hospitals, movie theatres, and the like. The system facilitates the customer identification and registration using wireless communication networks. The proposed system provides near real time customer identification, registration and performs related customer data analysis to notify one or more retail partners of a commercial establishment such as a retail store about behavior of customers of the store that in-turn helps the retail partners in rolling out appropriate recommendations/offers for the customers.

[0034] It should be noted that though the description of the customer identification and registration system is made with reference to retail stores, same technique may be applied for a variety of other commercial establishments.

[0035] FIG. 1 is a block diagram of an example embodiment of a customer identification and registration system 100, implemented according to aspects of the present technique. The system 100 includes one or more host units such as represented by reference numerals 102-A through 102-N, a centralized database 104 and an analytics engine 106. The system 100 is communicatively coupled to a retail management system of one or more retail partners such as represented by reference numerals 108-A through 108-N. Each component is described in further details below.

[0036] In the illustrated embodiment, each of the one or more host units 102-A through 102-N include a customer identification and registration device 114, a host computer 116 and a local database 118. The customer identification and registration device 114 is configured to receive a signal from one or more customer communication devices such as generally represented by reference numeral 120 of one or more customers, to detect a media access control (MAC) identification number of each of the one or more customer communication devices 120. Further, the customer identification and registration device 114 is configured to utilize the MAC identification number of the corresponding customer communication devices 120 to register the one or more customers with the system 100. Examples of the customer communication devices 120 include, but are not limited to, a tablet computer, a mobile communication device, a personal digital assistant (PDA), a personal computer, a smart phone, a smart watch, or combinations thereof.

[0037] In one example embodiment, the customer identification and registration device 114 is configured for short-range communication. For example, the short range operation may be in the range of about less than 1 meter. In one example, a customer is registered with the system 100 when he places his customer communication device 120 in contact with the customer identification and registration device 114 coupled with a point of sale (POS) device in a retail outlet. The point of sale (POS) device is a device located in a retail outlet and is configured to process transactions of a customer in the retail outlet. In this example

embodiment, the coupling of the customer identification and registration device 114 with the point of sale (POS) device is generic and can encompass several types of ports.

[0038] In another example embodiment, the customer identification and registration device 114 is configured for long-range communication. For example, the long range operation may be in the order of about 10 meters to 100 meters. In one example, as the customer enters a retail outlet, the customer identification and registration device 114 detects the presence of the customer communication device 120 of the customer via a wireless network. Upon detection of the presence of the customer communication device 120, the customer identification and registration device 114 identifies the customer using media access control (MAC) identification number. In yet another example of long range communication, the customer identification and registration device 114 is a standalone device directly connected over internet / cloud that detects the media access control (MAC) identification number of the communication device of customers and submits the detected media access control (MAC) identification number to the centralized database 104.

[0039] The host computer 116 is communicatively coupled to the customer identification and registration device 114 and is configured to generate customer data for the one or more customers based on the detected media access control (MAC) identification number of the corresponding customer communication device 120.

[0040] In one embodiment, the customer data may include customer profile data and transactional data. Examples of customer profile data include, but are not limited to, name of the customer, age of the customer, contact number of the customer, address of the customer, email address of the customer, demographic data of the customer, preferences of the customer, profile of the customer on a social networking site, day since last visit for the customer, number of total visits of the customer, or combinations thereof.

[0041] Examples of transactional data include, but are not limited to, data regarding purchases made by the customer, registration of the customer, purchase location of the customer, payment modes used by the customer, redemption of one or more offers provided to the customer by the client, or combinations thereof. In this embodiment, such customer data is stored in a local database 118 communicatively coupled to the host computer 116.

[0042] In one embodiment, the customer identification and registration device 114 is configured to receive a signal from the customer communication device 120 of a registered customer and to detect the MAC identification number of the customer communication device 120. Further, the host computer 116 is configured to retrieve customer registration data for the registered customer based on the detected MAC identification number. The host computer may retrieve the customer data from a local memory, or a shared memory.

[0043] In some examples, customer data from the local database 118 of the host units may be transmitted to the centralized database 104. In one embodiment, the centralized database 104 may be deployed on cloud. Other examples of deployment for the centralized database 104 may include, but are not limited to, on-premise deployment, hybrid deployment or combinations thereof.

[0044] The analytics engine 106 is configured to receive the customer data, analyze the customer data and to transmit analyzed data to the one or more retail partners such as 108-A communicatively coupled with the host units such as unit 102-A. In one embodiment, the one or more retail partners such as 108-A are configured to send one or more customized offers 110 to the customers based on the analysis of customer data. Examples of the one or more customized offers include, but are not limited to, product offers, discount coupons, award points, or combinations thereof.

[0045] In one embodiment, the retail partner such as 108-A includes a retail management system configured to generate the one or more customized offers 110. The retail management system is configured to analyze the customer data 112 for each customer and to select one or more applicable rules from a rules repository. The retail management system is further configured to apply the selected rules to generate the one or more customized offers 110-A for the respective customer.

[0046] In another embodiment, the one or more retail partners such as 108-A are configured to communicate the offers to the one or more customers through a customer communication interface such as represented by reference numeral 112-A. The customer communication interface 112-A may communicate with the customer via personalized

assistants or an electronic communication medium like a short message services (sms), an email, and an Internet based social networking site or combinations thereof.

[0047] FIG. 2 is flow chart illustrating process 200 for identifying and registering a new customer using the system 100 of FIG. 1, implemented according to aspects of the present technique. Each step is described in further detail below.

[0048] At step 202, a customer enters an establishment like a retail store and a signal from a customer communication device of a customer is received by a customer identification and registration device. In one embodiment, the customer communication device is placed proximate the customer identification and registration device. In another embodiment, the customer communication device is detected by the customer identification and registration device using wireless network. At step 204, the customer identification and registration device detects a media access control (MAC) identification number of the customer communication device.

[0049] At step 206, the customer communication device is registered with the system 100 using the MAC identification number of the customer communication device. Further, at step 208, customer data is generated based on the detected media access control (MAC) identification number by a host system. In one embodiment, customer data may include customer profile data and transactional data. Examples of the customer profile data include, but are not limited to, name of the customer, age of the customer, contact number of the customer, address of the customer, email address of the customer, demographic data of the customer, preferences of the customer, profile of the customer on a social networking site, day since last visit for the customer, number of total visits of the customer, or combinations thereof.

[0050] Examples of the transactional data includes, but are not limited to, data regarding purchases made by the customer, registration of the customer, purchase location of the customer, payment modes used by the customer, redemption of one or more offers provided to the customer by the client, or combinations thereof.

[0051] At step 210, the customer data is received and analyzed by an analytics engine. At step 212, the analyzed data is transmitted to at least one retail partner associated with the

system. In one embodiment, the retail partners are configured to send one or more customized offers to the customers. Examples of the one or more customized offers include, but are not limited to, product offers, discount coupons, award points, or combinations thereof.

[0052] FIG. 3 is flow chart illustrating process 300 for identifying an existing customer using the system 100 of FIG. 1, implemented according to aspects of the present technique. Each step is described in further detail below.

[0053] At step 302, a registered customer enters an establishment like a retail store and a signal from a customer communication device of the registered customer is received by a customer identification and registration device. In one embodiment, the customer communication device is placed proximate the customer identification and registration device. In another embodiment, the customer communication device is detected by the customer identification and registration device using wireless network. At step 304, the customer identification and registration device detects a media access control (MAC) identification number of the customer communication device.

[0054] Further, at step 306, customer data for the customer is retrieved from a memory based on the detected media access control (MAC) identification number. In one embodiment, customer data may include customer profile data and transactional data. Examples of the customer profile data include, but are not limited to, name of the customer, age of the customer, contact number of the customer, address of the customer, email address of the customer, demographic data of the customer, preferences of the customer, profile of the customer on a social networking site, day since last visit for the customer, number of total visits of the customer, or combinations thereof.

[0055] Examples of the transactional data includes, but are not limited to, data regarding purchases made by the customer, registration of the customer, purchase location of the customer, payment modes used by the customer, redemption of one or more offers provided to the customer by the client, or combinations thereof.

[0056] At step 308, the retrieved customer data is analyzed by an analytics engine. At step 310, the analyzed data is transmitted to at least one retail partner associated with the system. In one embodiment, the retail partners are configured to send one or more customized offers

to the customers. Examples of the one or more customized offers include, but are not limited to, product offers, discount coupons, award points, or combinations thereof.

[0057] FIG. 4 is an example customer identification and registration device 400 implemented according to aspects of the present technique. The customer identification and registration device 400 is configured to be used in an establishment such as business organizations, retail outlets, consumer outlets, hotels, restaurants, warehouses, banks, hospitals, or combinations thereof. The customer identification and registration device 400 may be coupled to a POS device of an establishment, or may be used as a stand-alone device. The customer identification and registration device 400 includes a proximity sensor that will be described in detail below with reference to FIG. 5. The customer identification and registration device 400 may include a short-range communication device, or a long-range communication device.

[0058] The customer identification and registration device 400 includes a processing circuitry communicatively coupled to the proximity sensor. The processing circuitry is configured to determine a media access control (MAC) identification number of the customer communication device upon detection of the presence of the customer communication device. Further, a communication interface configured to transmit the media access control (MAC) identification number of the customer communication device to a host computer is provided. It should be noted that a variety of other configurations and shapes may be envisaged for the customer identification and registration device 400.

[0059] FIG. 5 is an exploded view 500 of the customer identification and registration device 400 of FIG. 4. As illustrated, the customer identification and registration device 400 includes a proximity sensor 502 configured to detect presence of the customer communication device in an establishment. In some examples, the proximity sensor 502 may be an Infrared LED sensor. However, other sensors may be envisaged. The customer identification and registration device 400 includes a front cover 504 configured to enclose the components of the device 400. The front cover 504 provides an opening for the proximity sensor 502. In some embodiments, the front cover 504 may be transparent to electromagnetic waves to facilitate Wi-Fi detection of the customer communication device in the establishment.

[0060] In some embodiments, the proximity sensor 502 may be configured to register the customer communication device when the customer is proximate to the customer identification and registration device 400. The customer identification and registration device 400 further includes a LED pipe 506 and a RGB LED 508 that is configured to indicate the status of operation of the customer identification and registration device 400. For example, different colors displayed by the RGB LED 508 may represent different states of working of the customer identification and registration device 400.

[0061] The customer identification and registration device 400 further includes a printed circuit board (PCB) assembly 510. The PCB assembly 510 may include a Wi-Fi sensor, drivers for the proximity sensor 502 and status indicator LEDs. The PCB assembly 510 may also include one or more communication ports for connecting the customer identification and registration device 400 to hardware of a POS device. Moreover, the customer identification and registration device 400 may include shielding layer 512 configured to shield the device from unwanted signals present in the establishment. The shielding layer 512 is configured to provide Wi-Fi opaqueness from un-intended directions. In some embodiments, the shielding layer 512 comprises high conducting metal such as copper to prevent any kind of electromagnetic waves to pass through the customer identification and registration device 400. A cover 514 covers the internal components of the customer identification and registration device 400.

[0062] FIG. 6 is an example placement 600 of a customer identification and registration device 400 in an establishment, implemented according to aspects of the present technique. As illustrated, the customer identification and registration device 400 is electromagnetically shielded by a shielding layer 512 to protect the device 400 from unwanted signals within the establishment. In this embodiment, the customer identification and registration device 400 is configured to detect signals in a defined conical area 602 thereby limiting the sensitivity area of the customer identification and registration device 400. In one example, the sensitivity of the customer identification and registration device 400 is determined using software that determines a set cutoff value (represented by reference numeral 604) for the customer identification and registration device 400.

[0063] In this example, the communication devices 120-A, 120-B, 120-C and 120-D are in proximity to the customer identification and registration device 400. In this embodiment, the sensitivity of the customer identification and registration device 400 is defined such that only customer communication device 120A is detected by the customer identification and registration device 400 thereby facilitating accurate signal detection by the customer identification and registration device 400.

[0064] FIG. 7 is a block diagram illustrating an example computing device 700 that is arranged for identifying and registering a customer, implemented according to aspects of the present technique.

[0065] In a very basic configuration 702, the computing device 700 typically includes one or more processors 704 and a system memory 706. A memory bus 708 may be used for communicating between processor 704 and system memory 706. The processor 704 includes a multi-core processor.

[0066] Depending on the desired configuration, processor 704 may be of any type including but not limited to a microprocessor (μ P), a microcontroller (μ C), a digital signal processor (DSP), or any combination thereof. Processor 704 may include one more levels of caching, such as a level one cache 710 and a level two cache 712, two or more processor cores 714, and registers 716. An example processor core 714 may include an arithmetic logic unit (ALU), a floating point unit (FPU), a digital signal processor core (DSP Core), or any combination thereof. An example memory controller 718 may also be used with processor 704, or in some implementations memory controller 718 may be an internal part of processor 704.

[0067] Depending on the desired configuration, system memory 706 may be of any type including but not limited to volatile memory (such as RAM), non-volatile memory (such as ROM, flash memory, etc.) or any combination thereof. System memory 706 may include an operating system 720, one or more applications 722, and program data 724. In some embodiments, application 722 may be arranged to operate with program data 724 on operating system 720. This described basic configuration 702 is illustrated in FIG. 4 by those

components within the inner dashed line. Application 722 may include a customer identification and registration algorithm and program data 724 may include customer data.

[0068] Computing device 700 may have additional features or functionality, and additional interfaces to facilitate communications between basic configuration 702 and any required devices and interfaces. For example, a bus/interface controller 730 may be used to facilitate communications between basic configuration 702 and one or more data storage devices 732 via a storage interface bus 737. Data storage devices 732 may be removable storage devices 734, non-removable storage devices 736, or a combination thereof.

[0069] Examples of removable storage and non-removable storage devices include magnetic disk devices such as flexible disk drives and hard-disk drives (HDD), optical disk drives such as compact disk (CD) drives or digital versatile disk (DVD) drives, solid state drives (SSD), and tape drives to name a few. Example computer storage media may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, program modules, or other data.

[0070] System memory 706, removable storage devices 734 and non-removable storage devices 736 are examples of computer storage media. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which may be used to store the desired information and which may be accessed by computing device 700. Any such computer storage media may be part of computing device 700.

[0071] Computing device 700 may also include an interface bus 738 for facilitating communication from various interface devices (e.g., output devices 740, peripheral interfaces 748, and communication devices 760) to basic configuration 702 via bus/interface controller 730. Example output devices 740 include a graphics processing unit 744 and an audio processing unit 746, which may be configured to communicate to various external devices such as a display or speakers via one or more A/V ports 742.

[0072] Example peripheral interfaces 748 include a serial interface controller 750 or a parallel interface controller 752, which may be configured to communicate with external devices such as input devices (e.g., keyboard, mouse, pen, voice input device, touch input device, etc.) or other peripheral devices (e.g., printer, scanner, etc.) via one or more I/O ports 749. An example communication device 760 includes a network controller 754, which may be arranged to facilitate communications with one or more other computing devices 758 over a network communication link via one or more communication ports 756.

[0073] The network communication link may be one example of a communication media. Communication media may typically be embodied by computer readable instructions, data structures, program modules, or other data in a modulated data signal, such as a carrier wave or other transport mechanism, and may include any information delivery media. A “modulated data signal” may be a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio frequency (RF), microwave, infrared (IR) and other wireless media. The term computer readable media as used herein may include both storage media and communication media.

[0074] Computing device 700 may be implemented as a micro-controller based system, a system without operating system, an application specific integrated circuit (ASIC), a portion of a small-form factor portable (or mobile) electronic device such as a cell phone, a personal data assistant (PDA), a personal media player device, a wireless web-watch device, a personal headset device, an application specific device, or a hybrid device that include any of the above functions. Computing device 700 may also be implemented as a personal computer including both laptop computer and non-laptop computer configurations.

[0075] It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (e.g., bodies of the appended claims) are generally intended as “open” terms (e.g., the term “including” should be interpreted as “including but not limited to,” the term “having” should be interpreted as “having at least,” the term “includes” should be interpreted as “includes but is not limited to,” etc.). It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an

intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present.

[0076] For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (e.g., "a" and/or "an" should be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should be interpreted to mean at least the recited number (e.g., the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations).

[0077] While only certain features of several embodiments have been illustrated and described herein, many modifications and changes will occur to those skilled in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the invention.

[0078] The aforementioned description is merely illustrative in nature and is in no way intended to limit the disclosure, its application, or uses. The broad teachings of the disclosure can be implemented in a variety of forms. Therefore, while this disclosure includes particular examples, the true scope of the disclosure should not be so limited since other modifications will become apparent upon a study of the drawings, the specification, and the following claims. It should be understood that one or more steps within a method may be executed in different order (or concurrently) without altering the principles of the present disclosure. Further, although each of the embodiments is described above as having certain features, any one or more of those features described with respect to any embodiment of the disclosure can be implemented in and/or combined with features of any of the other embodiments, even if that combination is not explicitly described. In other words, the described embodiments are

not mutually exclusive, and permutations of one or more embodiments with one another remain within the scope of this disclosure.

[0079] The patent claims filed with the application are formulation proposals without prejudice for obtaining more extensive patent protection. The applicant reserves the right to claim even further combinations of features previously disclosed only in the description and/or drawings.

[0080] The example embodiment or each example embodiment should not be understood as a restriction of the invention. Rather, numerous variations and modifications are possible in the context of the present disclosure, in particular those variants and combinations which can be inferred by the person skilled in the art with regard to achieving the object for example by combination or modification of individual features or elements or method steps that are described in connection with the general or specific part of the description and are contained in the claims and/or the drawings, and, by way of combinable features, lead to a new subject matter or to new method steps or sequences of method steps, including insofar as they concern production, testing and operating methods. Further, elements and/or features of different example embodiments may be combined with each other and/or substituted for each other within the scope of this disclosure and appended claims.

[0081] References back that are used in dependent claims indicate the further embodiment of the subject matter of the main claim by way of the features of the respective dependent claim, they should not be understood as dispensing with obtaining independent protection of the subject matter for the combinations of features in the referred-back dependent claims. Furthermore, with regard to interpreting the claims, where a feature is concretized in more specific detail in a subordinate claim, it should be assumed that such a restriction is not present in the respective preceding claims.

[0082] Since the subject matter of the dependent claims in relation to the prior art on the priority date may form separate and independent inventions, the applicant reserves the right to make them the subject matter of independent claims or divisional declarations. They may furthermore also contain independent inventions, which have a configuration that is independent of the subject matters of the preceding dependent claims.

[0083] Still further, any one of the above-described and other example features of the present invention may be embodied in the form of an apparatus, method, system, computer program, tangible computer readable medium and tangible computer program product. For example, of the aforementioned methods may be embodied in the form of a system or device, including, but not limited to, any of the structure for performing the methodology illustrated in the drawings.

[0084] In this application, including the definitions below, the term ‘module’ or the term ‘controller’ may be replaced with the term ‘circuit.’ The term ‘module’ may refer to, be part of, or include processor hardware (shared, dedicated, or group) that executes code and memory hardware (shared, dedicated, or group) that stores code executed by the processor hardware.

[0085] The module may include one or more interface circuits. In some examples, the interface circuits may include wired or wireless interfaces that are connected to a local area network (LAN), the Internet, a wide area network (WAN), or combinations thereof. The functionality of any given module of the present disclosure may be distributed among multiple modules that are connected via interface circuits. For example, multiple modules may allow load balancing. In a further example, a server (also known as remote, or cloud) module may accomplish some functionality on behalf of a client module.

[0086] Further, at least one embodiment of the invention relates to a non-transitory computer-readable storage medium comprising electronically readable control information stored thereon, configured in such that when the storage medium is used in a controller of a magnetic resonance device, at least one embodiment of the method is carried out.

[0087] Even further, any of the aforementioned methods may be embodied in the form of a program. The program may be stored on a non-transitory computer readable medium and is adapted to perform any one of the aforementioned methods when run on a computer device (a device including a processor). Thus, the non-transitory, tangible computer readable medium, is adapted to store information and is adapted to interact with a data processing facility or computer device to execute the program of any of the above mentioned embodiments and/or to perform the method of any of the above mentioned embodiments.

[0088] The computer readable medium or storage medium may be a built-in medium installed inside a computer device main body or a removable medium arranged so that it can be separated from the computer device main body. The term computer-readable medium, as used herein, does not encompass transitory electrical or electromagnetic signals propagating through a medium (such as on a carrier wave), the term computer-readable medium is therefore considered tangible and non-transitory. Non-limiting examples of the non-transitory computer-readable medium include, but are not limited to, rewriteable non-volatile memory devices (including, for example flash memory devices, erasable programmable read-only memory devices, or a mask read-only memory devices), volatile memory devices (including, for example static random access memory devices or a dynamic random access memory devices), magnetic storage media (including, for example an analog or digital magnetic tape or a hard disk drive), and optical storage media (including, for example a CD, a DVD, or a Blu-ray Disc). Examples of the media with a built-in rewriteable non-volatile memory, include but are not limited to memory cards, and media with a built-in ROM, including but not limited to ROM cassettes, etc. Furthermore, various information regarding stored images, for example, property information, may be stored in any other form, or it may be provided in other ways.

[0089] The term code, as used above, may include software, firmware, and/or microcode, and may refer to programs, routines, functions, classes, data structures, and/or objects. Shared processor hardware encompasses a single microprocessor that executes some or all code from multiple modules. Group processor hardware encompasses a microprocessor that, in combination with additional microprocessors, executes some or all code from one or more modules. References to multiple microprocessors encompass multiple microprocessors on discrete dies, multiple microprocessors on a single die, multiple cores of a single microprocessor, multiple threads of a single microprocessor, or a combination of the above.

[0090] Shared memory hardware encompasses a single memory device that stores some or all code from multiple modules. Group memory hardware encompasses a memory device that, in combination with other memory devices, stores some or all code from one or more modules.

[0091] The term memory hardware is a subset of the term computer-readable medium. The term computer-readable medium, as used herein, does not encompass transitory electrical or electromagnetic signals propagating through a medium (such as on a carrier wave), the term computer-readable medium is therefore considered tangible and non-transitory. Non-limiting examples of the non-transitory computer-readable medium include, but are not limited to, rewriteable non-volatile memory devices (including, for example flash memory devices, erasable programmable read-only memory devices, or a mask read-only memory devices), volatile memory devices (including, for example static random access memory devices or a dynamic random access memory devices), magnetic storage media (including, for example an analog or digital magnetic tape or a hard disk drive), and optical storage media (including, for example a CD, a DVD, or a Blu-ray Disc). Examples of the media with a built-in rewriteable non-volatile memory, include but are not limited to memory cards, and media with a built-in ROM, including but not limited to ROM cassettes, etc. Furthermore, various information regarding stored images, for example, property information, may be stored in any other form, or it may be provided in other ways.

[0092] The apparatuses and methods described in this application may be partially or fully implemented by a special purpose computer created by configuring a general purpose computer to execute one or more particular functions embodied in computer programs. The functional blocks and flowchart elements described above serve as software specifications, which can be translated into the computer programs by the routine work of a skilled technician or programmer.

[0093] The computer programs include processor-executable instructions that are stored on at least one non-transitory computer-readable medium. The computer programs may also include or rely on stored data. The computer programs may encompass a basic input/output system (BIOS) that interacts with hardware of the special purpose computer, device drivers that interact with particular devices of the special purpose computer, one or more operating systems, user applications, background services, background applications, etc.

[0094] The computer programs may include: (i) descriptive text to be parsed, such as HTML (hypertext markup language) or XML (extensible markup language), (ii) assembly code, (iii) object code generated from source code by a compiler, (iv) source code for

execution by an interpreter, (v) source code for compilation and execution by a just-in-time compiler, etc. As examples only, source code may be written using syntax from languages including C, C++, C#, Objective-C, Haskell, Go, SQL, R, Lisp, Java®, Fortran, Perl, Pascal, Curl, OCaml, Javascript®, HTML5, Ada, ASP (active server pages), PHP, Scala, Eiffel, Smalltalk, Erlang, Ruby, Flash®, Visual Basic®, Lua, and Python®.

[0095] None of the elements recited in the claims are intended to be a means-plus-function element within the meaning of 35 U.S.C. §112(f) unless an element is expressly recited using the phrase “means for” or, in the case of a method claim, using the phrases “operation for” or “step for.”

[0096] Example embodiments being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the present invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

Claims

1. A customer identification and registration system, the system comprising:
 - a customer identification and registration device configured to receive a signal from one or more customer communication devices of one or more customers, to detect a media access control (MAC) identification number of each of the one or more customer communication devices, wherein the customer identification and registration device is configured to utilize the MAC identification number of the corresponding customer communication devices to register the one or more customers with the system;
 - a host computer communicatively coupled to the customer identification and registration device and configured to generate customer data for the one or more customers based on the detected media access control (MAC) identification number of the corresponding customer communication devices; and
 - an analytics engine communicatively coupled to the host computer and configured to receive the customer data, wherein the analytics engine is configured to analyze the customer data and to transmit analyzed data to at least one retail partner associated with the system.
2. The customer identification and registration system of claim 1, further comprising a centralized database configured to store the customer data received from the host computer.
3. The customer identification and registration system of claim 1, wherein the customer identification and registration device is configured for short-range communication.
4. The customer identification and registration system of claim 1, wherein the customer identification and registration device is configured for long-range communication.
5. The customer identification and registration system of claim 1, wherein the customer data comprises customer profile data, transactional data, or combinations thereof.
6. The customer identification and registration system of claim 5, wherein the customer profile data comprises name of the customer, age of the customer, contact number of the customer, address of the customer, email address of the customer, demographic data of the customer, preferences of the customer, profile of the customer on a social networking site, day

since last visit for the customer, number of total visits of the customer, or combinations thereof.

7. The customer identification and registration system of claim 5, wherein the transactional data comprises data regarding purchases made by the customer, registration of the customer, purchase location of the customer, payment modes used by the customer, redemption of one or more offers provided to the customer by the client, or combinations thereof.

8. The customer identification and registration system of claim 1, wherein the at least one retail partner comprises a retail analytics engine configured to generate one or one or more customized offers for the customers based on the analyzed customer data.

9. The customer identification and registration system of claim 1, wherein the one or more customized offers comprise product offers, discount coupons, award points, or combinations thereof.

10. A customer identification and registration system, the system comprising:

- a customer identification and registration device configured to receive a signal from a customer communication device of a registered customer, to detect a media access control (MAC) identification number of the customer communication device of the registered customer;

- a host computer communicatively coupled to the customer identification and registration device and configured to retrieve customer registration data for the registered customer based on the detected media access control (MAC) identification number of the corresponding customer communication device; and

- an analytics engine communicatively coupled to the host computer configured to receive the retrieved customer data and wherein the analytics engine is configured to analyze the customer data and to transmit analyzed data to at least one retail partner associated with the system.

11. The customer identification and registration system of claim 10, wherein the host computer is configured to retrieve the customer data from a local memory, or a shared memory.
12. The customer identification and registration system of claim 10, wherein the customer identification and registration device is Wi-Fi enabled device.
13. The customer identification and registration system of claim 10, wherein the customer identification and registration device is communicatively coupled to a point-of-sale (POS) device of a retail store.
14. A customer identification and registration device configured to be used in an establishment, the customer identification and registration device comprising:
 - a proximity sensor configured to detect presence of a customer communication device in the establishment;
 - a processing circuitry communicatively coupled to the proximity sensor, wherein the processing circuitry is configured to determine a media access control (MAC) identification number of the customer communication device upon detection of the presence of the customer communication device; and
 - a communication interface configured to transmit the media access control (MAC) identification number of the customer communication device to a host computer.
15. The customer identification and registration device of claim 14, wherein the establishment comprises business organizations, retail outlets, consumer outlets, hotels, restaurants, warehouses, banks, hospitals, or combinations thereof.
16. The customer identification and registration device of claim 14, further comprising a shielding layer configured to shield the device from unwanted signals present in the establishment.
17. The customer identification and registration device of claim 14, wherein the host computer is configured to retrieve customer registration data for a customer based on the

detected media access control (MAC) identification number of the corresponding customer communication device.

18. The customer identification and registration system of claim 14, wherein the customer identification and registration device is configured for short-range communication.

19. The customer identification and registration system of claim 14, wherein the customer identification and registration device is configured for long-range communication.