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(57) Abstract :
ABSTRACT VIRTUAL SHOPPING FACILITATION MODULE ASSOCIATED WITH ROBOTIC CART AND AUGMENTED REALITY (AR) GLASSES The disclosed method and system provides an approach for facilitating users in selecting items and/or products via virtual shopping by associating a robotic shopping cart and an augmented reality (AR) device with the users for enabling contact-less shopping. The disclosed system implements the method for receiving customer authentication data from a user and associating the customer authentication data with a tagged wearable device and a tagged mobility device with the user. The method further includes receiving an indication the user is wearing the tagged mobility device, and that the user is entering a shopping facility using the tagged mobility device. The method further includes receiving a user instruction to capture an image causing the tagged wearable device to capture the image, determining an item and transmitting an action instruction to the tagged mobility device to retrieve the item and secure the item.

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The following Specification Particularly Describes the Invention and the Manner in Which it is to be Performed

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VIRTUAL SHOPPING FACILITATION MODULE ASSOCIATED WITH ROBOTIC CART AND AUGMENTED REALITY (AR) GLASSES

FIELD OF THE INVENTION

[0001] The present invention relates generally to the field of virtual shopping and related facilitating devices. More particularly, the invention provides an approach for facilitating users in selecting items and/or products via virtual shopping by associating a mobile robotic shopping cart with the users.

BACKGROUND OF THE INVENTION

[0002] Users utilize a variety of different shopping methods, including for some, visiting a store in-person, and for others, use of a shopping software application to create a list. A shopping software application allows users to shop without entering a physical store, however, users do not have a view to the items in the store and only add a product and quantity for another person to select. The user does not have visibility to the quality of the product.

[0003] The retail industry is a highly competitive industry. Attracting and maintaining repeat customers is one of the industry's biggest challenges. Today, consumers shop in a multichannel environment, meaning they switch fluidly between brick-and-mortar, and online retail outlets. The increased use of the internet and social media provides retail customers with a greater amount of information to make purchasing decisions. Brick-and-mortar retailers are challenged with providing the consumer with a richer experience than they can obtain online, in order to increase in-store sales, and stay in business. Delivering the right message to the right time to a customer that influences purchasing is one of brick-and-mortar retail's biggest impediments.

[0004] Currently, the greatest fear in brick-and-mortar retail is showrooming. Showrooming is defined as when a shopper visits a brick-and-mortar store to check out a product, but then either heads home or uses a mobile device in-store to make the purchase from an online retail establishment. It is estimated that over 47% of consumers' showroom today, with that number

increasing exponentially each year. Many retailers are closing stores due to this phenomenon. Though brick-and-mortar retail still accounts for approximately 90% of all retail purchases, online retail as a percentage of total retail is growing at over 10% annually. This places incredible stress on physical retail as they need to bring in more sales at a larger margin than online retailers to compensate for their large overheads.

[0005] In order to combat this continued online retail growth, brick-and-mortar retailers need to provide the right message to the right customer at the right time, an issue they continue to struggle with. Today's shopper expects the information they are provided in-store to be relevant to their needs. Online retail has the ability to use data driven practices to provide optimized messaging to their customers that will influence their purchasing. Brick-and-mortar retailers do not have this ability today. In fact, most consumers believe that associates within brick-and-mortar retail do not have enough product knowledge to provide sufficient assistance with their purchasing decisions. Over 70% of consumers make purchasing decisions after reading trusted third party reviews—which are not available in-store today, except through using a mobile device, which typically brings that customer to a competitor's site. Out of those who use their mobile device while shopping in physical retail, over 60% are initially using the device to gain more information, however, a competitors site will usually provide a better price or a better deal to that customer as well, leading them to purchase online and leave the retail store.

SUMMARY

[0006] Embodiments of the present invention discloses a method and system for presenting virtual shopping and related facilitating devices. More particularly, the invention provides a method and system for facilitating users in selecting items and/or products via virtual shopping by associating a mobile robotic shopping cart with the users.

[0007] Further, embodiments of the present invention disclose a method and a system for providing virtual shopping facilitation to a user. The method includes receiving customer authentication data from a user and associating the customer authentication data with a tagged wearable device and a tagged mobility device with the user. The method further includes receiving an indication the user is wearing the tagged mobility device, and that the user is entering a shopping facility using the tagged mobility device.

[0008] The method further includes receiving a user instruction to capture an image causing the tagged wearable device to capture the image, identifying a bar code in the image, determining an item based on the bar code and transmitting an action instruction to the tagged mobility device to retrieve the item and secure the item. The method further includes receiving an indication that the user has completed the task.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Fig. 1 is a functional block diagram illustrating a distributed data processing environment, in accordance with an embodiment of the present invention;

[00010] Fig. 2 is a flowchart depicting functional steps of a shopping facility program, on a server computer within the distributed data processing environment of Fig. 1, for providing virtual shopping facility to a user, in accordance with an embodiment of the present invention;

[00011] Fig. 3 illustrates an example display a user utilizing the shopping facility program, in accordance with an embodiment of the present invention;

[00012] Fig. 4 depicts a block diagram of components of the server computer executing the shopping facility program within the distributed data processing environment, in accordance with an embodiment of the present invention.

DESCRIPTION OF THE INVENTION

[00013] The present invention will now be described in detail with reference to the Fig. 1 is a functional block diagram illustrating a data processing environment, generally designated 100, in accordance with one embodiment of the present invention. In an embodiment, data processing environment 100 may be a distributed data processing environment. The term "distributed" can describe a computer system that includes multiple, physically distinct devices that operate together as a single computer system. Fig. 1

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provides only an illustration of one implementation and does not imply any limitations with regard to the environments in which different embodiments may be made by those skilled in the art without departing from the scope of the invention as recited by the claims.

[00014] Data processing environment 100 includes server computing device 110 and client computing device 130, interconnected via network 120. Network 120 can be, for example, a telecommunications network, a local area network (LAN), a wide area network (WAN), such as the Internet, or a combination of the three, and can include wired, wireless, or fiber optic connections. Network 120 can include one or more wired and/or wireless networks that are capable of receiving and transmitting data, voice, and/or video signals, including multimedia signals that include voice, data, and video information. In general, network 120 can be any combination of connections and protocols that will support communications between server computing device 110, client computing device 130, and other computing devices (not shown) within data processing environment 100.

[00015] Server computing device 110 can be a standalone computing device, a management server, a web server, a mobile computing device, or any other electronic device or computing system capable of receiving, sending, and processing data. In other embodiments, server computing device 110 can represent a server computing system utilizing multiple computers as a server system, such as in a cloud computing environment. In another embodiment, server computing device 110 can be a laptop computer, a tablet computer, a netbook computer, a personal computer (PC), a desktop computer, a personal digital assistant (PDA), a smart phone, or any programmable electronic device capable of communicating with client computing device 130 and other computing devices (not shown) within data processing environment 100 via network 120. In another embodiment, server computing device 110 represents a computing system utilizing clustered computers and components (e.g., database server computers, application server computers, etc.) that act as a single pool of seamless resources when accessed within data processing environment 100. Server computing device 110 may include internal and external hardware components, as depicted and described in further detail with respect to Fig. 4.

[00016] In various embodiments of the present invention, client computing device 130 can be one of a desktop computer, a laptop computer, a tablet computer, a smart phone, or any programmable electronic device capable of communicating with various components and devices within data processing environment 100, via network 120. In general, client computing device 130 represents any programmable electronic device or combination of programmable electronic devices capable of executing machine readable program instructions and communicating with other computing devices (not shown) within data processing environment 100 via a network, such as network 120. In some embodiments, a screen of client computing device 130 is incorporated with the device 130. In other embodiments, a display screen can be separate from the client computing device 130, connected with a network, such as network 120, or computing cables. Client computing device 130 includes shopping facility program 132. In various embodiments, shopping facility program 132 may reside on server computing device 110 in data processing environment 100, and accessible by client computing device 130 via network 120. Client computing device 130 may include internal and external hardware components, as depicted and described in further detail with respect to Fig. 4.

[00017] Shopping facility program 132 may be a mobile application software program, or a "mobile app" or an "app", designed to run on a smart phone, a tablet computer, or other mobile devices. Shopping facility program 132 may operate within a web browser, or other compatible software used for shopping displayed via client computing device 130. Shopping facility program 132 may be any native application or pre-installed software on a mobile computing device, such as client computing device 130. A native application can be, for example, a web browser, email client, mapping program, or an app for purchasing music, other media, or additional apps. Shopping facility program 132 may be a software application or a web application that can run in a mobile web browser.

[00018] Fig. 2 is a flowchart 200 depicting operational steps of shopping facility program 132 for providing virtual contact-less shopping facility to a user, in accordance with an embodiment of the present invention.

[00019] Shopping facility program 132 proceeds with the following steps: At step 100, consumer walks into the shopping area. At step 104, drops the customer card of the shopping vendor into the vending machine. At step 106, vending machine reads the customer card and tags it with the wearable computing glasses. Also delivers the device to the consumer. At step 108, consumer also receives the customer card tagged robot cart which is also tagged with the computing device.

[00020] Shopping facility program 132 then includes step 202 where the consumer wears the eye wearable computing device and starts to walk into the shopping area. At step 204, robot cart follows the customer while the person starts the shopping. At step 207, enter the shopping area to look for the products the consumer would want to buy. At step 209, identifies the product the consumer wants to purchase. At step 210, winks at the product to capture selection of the product. At step 212, picture is sent to the robot cart, indicating selection. At step 215, robot cart analyses the picture and reads the barcode from the picture. At step 217, robot cart identifies the product from the product database. At step 219, robot cart requests user for item quantity through voice commands. At step 223, the consumer gives voice command on the quantity. At step 225, robot cart reviews it and updates the virtual cart database. At step 227, robot hand(s) picks up the quantity of the product from the shopping rack. At step 229, robot drops the picked up products into the cart. At step 241, the cart is ready for delivery after selecting all the products selected by the consumer. Shopping facility program 132 then moves to step 300 where the customer completes the shopping of all desired products using this process. At step 302, consumer completes the

shopping and ready to go for delivery. At step 305, reaches the delivery desk. At step 307, drop the eye wearable computing device into the vending machine. At step 310, receives the customer card and the virtual cart information. At step 312 consumer pays the bill. At step 315, receives the purchased items for delivery.

[00021] The present invention may contain various accessible data sources, such as databases, that may include personal data, content, or information the user wishes not to be processed. Personal data includes personally identifying information or sensitive personal information as well as user information, such as tracking or geolocation information.

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Processing refers to any, automated or un-automated, operation or set of operations such as collection, recording, organization, structuring, storage, adaptation, alteration, retrieval, consultation, use, disclosure by transmission, dissemination, or otherwise making available, combination, restriction, erasure, or destruction performed on personal data. Shopping facility program 132 enables the authorized and secure processing of personal data. Shopping facility program 132 provides informed consent, with notice of the collection of personal data, allowing the user to opt in or opt out of processing personal data. Consent can take several forms. Opt-in consent can impose on the user to take an affirmative action before personal data is processed. Alternatively, opt-out consent can impose on the user to take an affirmative action to prevent the processing of personal data before personal data is processed. Shopping facility program 132 provides information regarding personal data and the nature (e.g., type, scope, purpose, duration, etc.) of the processing. Shopping facility program 132 provides the user with copies of stored personal data. Shopping facility program 132 allows the correction or completion of incorrect or incomplete personal data. Shopping facility program 132 allows the immediate deletion of personal data.

[00022] Fig. 3 illustrates an example display 300 for a user utilizing the shopping facility program, in accordance with an embodiment of the present invention.

[00023] Fig. 4 depicts a block diagram 400 of components of server computing device 110 or client computing device 130 within data processing environment 100 of Fig. 1, in accordance with an embodiment of the present invention. It should be appreciated that Fig. 4 provides only an illustration of one implementation and does not imply any limitations with regard to the environments in which different embodiments can be implemented. Many modifications to the depicted environment can be made.

[00024] Server computing device 110 or client computing device 130 can include processor(s) 402, memory 404, cache 406, persistent storage 410, input/output (I/O) interface(s) 412, communications unit 414, and communications fabric 408. Communications fabric 408 provides communications between memory 404, cache 406, persistent storage 410, communications unit 414, and input/output (I/O) interface(s) 412. Communications fabric 408 can be implemented with any architecture designed for passing data and/or control information

between processors (such as microprocessors, communications and network processors, etc.), system memory, peripheral devices, and any other hardware components within a system. For example, communications fabric 408 can be implemented with one or more buses.

[00025] Memory 404 and persistent storage 410 are computer readable storage media. In this embodiment, memory 404 includes random access memory (RAM). In general, memory 404 can include any suitable volatile or non-volatile computer readable storage media. Cache 406 is a fast memory that enhances the performance of processor(s) 402 by holding recently accessed data, and data near recently accessed data, from memory 404.

[00026] Program instructions and data used to practice embodiments of the present invention, such as shopping facility program 132, can be stored in persistent storage 410 for execution and/or access by one or more of the respective processor(s) 402 of client computing device 130 via cache 406. In this embodiment, persistent storage 410 includes a magnetic hard disk drive. Alternatively, or in addition to a magnetic hard disk drive, persistent storage 410 can include a solid-state hard drive, a semiconductor storage device, a read-only memory (ROM), an erasable programmable read-only memory (EPROM), a flash memory, or any other computer readable storage media or device that is capable of storing program instructions or digital information.

[00027] The media used by persistent storage 410 may also be removable. For example, a removable hard drive may be used for persistent storage 410. Other examples include optical and magnetic disks, thumb drives, and smart cards that are inserted into a drive for transfer onto another computer readable storage medium that is also part of persistent storage 410.

[00028] Communications unit 414, in these examples, provides for communications with other data processing systems or devices, including resources of server computing device 110 or client computing device 130. In these examples, communications unit 414 includes one or more network interface cards. Communications unit 414 may provide communications through the use of either or both physical and wireless communications links. Software and data used to practice embodiments of the present invention, for example, digital text program 132, may be downloaded to persistent storage 410 through communications unit 414.

[00029] I/O interface(s) 412 allows for input and output of data with other devices that may be connected to server computing device 110 or client computing device 130. For example, I/O interface(s) 412 may provide a connection to external device(s) 416 such as a keyboard, a keypad, a touch screen, a microphone, a digital camera, and/or some other suitable input device. External device(s) 416 can also include portable computer readable storage media such as, for example, thumb drives, portable optical or magnetic disks, and memory cards. Software and data used to practice embodiments of the present invention can be stored on such portable computer readable storage media and can be loaded onto persistent storage 410 via I/O interface(s) 412. I/O interface(s) 412 also connect to a display 418.

[00030] Display 418 provides a mechanism to display data to a user and may be, for example, a computer monitor or an incorporated display screen, such as is used, for example, in tablet computers and smart phones.

[00031] It is to be understood that although this disclosure includes a detailed description on cloud computing, implementation of the teachings recited herein are not limited to a cloud computing environment. Rather, embodiments of the present invention are capable of being implemented in conjunction with any other type of computing environment now known or later developed.

[00032] Cloud computing is a model of service delivery for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, network bandwidth, servers, processing, memory, storage, applications, virtual machines, and services) that can be rapidly provisioned and released with minimal management effort or interaction with a provider of the service. This cloud model may include at least five characteristics, at least three service models, and at least four deployment models.

[00033] On-demand self-service: a cloud consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with the service's provider.

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[00034] Broad network access: capabilities are available over a network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops, and PDAs).

[00035] Resource pooling: the provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to demand. There is a sense of location independence in that the consumer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter).

[00036] Rapid elasticity: capabilities can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time.

[00037] Measured service: cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service.

[00038] Software as a Service (SaaS): the capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based email). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

[00039] Platform as a Service (PaaS): the capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including networks, servers, operating systems,

or storage, but has control over the deployed applications and possibly application hosting environment configurations.

[00040] Infrastructure as a Service (IaaS): the capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).

[00041] Private cloud: the cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may exist on-premises or off-premises.

[00042] Community cloud: the cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be managed by the organizations or a third party and may exist on-premises or off-premises.

[00043] Public cloud: the cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services. Hybrid cloud: the cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load-balancing between clouds).

[00044] A cloud computing environment is service oriented with a focus on statelessness, low coupling, modularity, and semantic interoperability. At the heart of cloud computing is an infrastructure that includes a network of interconnected nodes.

[00045] Cloud computing environment includes one or more cloud computing nodes with which local computing devices used by cloud consumers, such as, for example, personal digital assistant (PDA) or cellular telephone, desktop computer, laptop computer, and/or automobile computer system may communicate. Cloud computing nodes may communicate with

one another. They may be grouped physically or virtually, in one or more networks, such as Private, Community, Public, or Hybrid clouds as described hereinabove, or a combination thereof. This allows cloud computing environment to offer infrastructure, platforms and/or software as services for which a cloud consumer does not need to maintain resources on a local computing device. It is understood that the types of computing devices are intended to be illustrative only and that cloud computing nodes and cloud computing environment can communicate with any type of computerized device over any type of network and/or network addressable connection (e.g., using a web browser).

[00046] The programs described herein are identified based upon the application for which they are implemented in a specific embodiment of the invention. However, it should be appreciated that any particular program nomenclature herein is used merely for convenience, and thus the invention should not be limited to use solely in any specific application identified and/or implied by such nomenclature.

[00047] The present invention may be a system, a method, and/or a computer program product. The computer program product may include a computer readable storage medium (or media) having computer readable program instructions thereon for causing a processor to carry out aspects of the present invention.

[00048] The computer readable storage medium can be any tangible device that can retain and store instructions for use by an instruction execution device. The computer readable storage medium may be, for example, but is not limited to, an electronic storage device, a magnetic storage device, an optical storage device, an electromagnetic storage device, a semiconductor storage device, or any suitable combination of the foregoing. A non-exhaustive list of more specific examples of the computer readable storage medium includes the following: a portable computer diskette, a hard disk, a random access memory (RAM), a read only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), a static random access memory (SRAM), a portable compact disc read-only memory (CD-ROM), a digital versatile disk (DVD), a memory stick, a floppy disk, a mechanically encoded device such as punch-cards or raised structures in a groove having instructions recorded thereon, and any suitable combination of the foregoing. A computer readable storage

medium, as used herein, is not to be construed as being transitory signals per se, such as radio waves or other freely propagating electromagnetic waves, electromagnetic waves propagating through a waveguide or other transmission media (e.g., light pulses passing through a fiber optic cable), or electrical signals transmitted through a wire.

[00049] Computer readable program instructions described herein can be downloaded to respective computing/processing devices from a computer readable storage medium or to an external computer or external storage device via a network, for example, the Internet, a local area network, a wide area network and/or a wireless network. The network may comprise copper transmission cables, optical transmission fibers, wireless transmission, routers, firewalls, switches, gateway computers and/or edge servers. A network adapter card or network interface in each computing/processing device receives computer readable program instructions from the network and forwards the computer readable program instructions for storage in a computer readable storage medium within the respective computing/processing device.

[00050] Computer readable program instructions for carrying out operations of the present invention may be assembler instructions, instruction-set-architecture (ISA) instructions, machine instructions, machine dependent instructions, microcode, firmware instructions, state setting data, or either source code or object code written in any combination of one or more programming languages, including an object oriented programming language such as Smalltalk, C++ or the like, and conventional procedural programming languages, such as the "C" programming language or similar programming languages. The computer readable program instructions may execute entirely on the user's computer, partly on the user's computer, as a stand-alone software package, partly on the user's computer and partly on a remote computer or entirely on the remote computer or server. In the latter scenario, the remote computer may be connected to the user's computer through any type of network, including a local area network (LAN) or a wide area network (WAN), or the connection may be made to an external computer (for example, through the Internet using an Internet Service Provider). In some embodiments, electronic circuitry including, for example, programmable logic circuitry, field-programmable gate arrays (FPGA), or programmable logic arrays (PLA)

may execute the computer readable program instructions by utilizing state information of the computer readable program instructions to personalize the electronic circuitry, in order to perform aspects of the present invention.

[00051] Aspects of the present invention are described herein with reference to flowchart illustrations and/or block diagrams of methods, apparatus (systems), and computer program products according to embodiments of the invention. It will be understood that each block of the flowchart illustrations and/or block diagrams, and combinations of blocks in the flowchart illustrations and/or block diagrams, can be implemented by computer readable program instructions.

[00052] These computer readable program instructions may be provided to a processor of a general purpose computer, a special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, create means for implementing the functions/acts specified in the flowchart and/or block diagram block or blocks. These computer readable program instructions may also be stored in a computer readable storage medium that can direct a computer, a programmable data processing apparatus, and/or other devices to function in a particular manner, such that the computer readable storage medium having instructions stored therein comprises an article of manufacture including instructions which implement aspects of the function/act specified in the flowchart and/or block diagram block or blocks.

[00053] The computer readable program instructions may also be loaded onto a computer, other programmable data processing apparatus, or other device to cause a series of operational steps to be performed on the computer, other programmable apparatus or other device to produce a computer implemented process, such that the instructions which execute on the computer, other programmable apparatus, or other device implement the functions/acts specified in the flowchart and/or block diagram block or blocks.

[00054] The flowchart and block diagrams in the figures illustrate the architecture, functionality, and operation of possible implementations of systems, methods, and computer

program products according to various embodiments of the present invention. In this regard, each block in the flowchart or block diagrams may represent a module, a segment, or a portion of instructions, which comprises one or more executable instructions for implementing the specified logical function(s). In some alternative implementations, the functions noted in the blocks may occur out of the order noted in the figures. For example, two blocks shown in succession may, in fact, be executed substantially concurrently, or the blocks may sometimes be executed in the reverse order, depending upon the functionality involved. It will also be noted that each block of the block diagrams and/or flowchart illustration, and combinations of blocks in the block diagrams and/or flowchart illustration, can be implemented by special purpose hardware-based systems that perform the specified functions or acts or carry out combinations of special purpose hardware and computer instructions.

[00055] The descriptions of the various embodiments of the present invention have been presented for purposes of illustration, but are not intended to be exhaustive or limited to the embodiments disclosed. Many modifications and variations will be apparent to those of ordinary skill in the art without departing from the scope and spirit of the invention. The terminology used herein was chosen to best explain the principles of the embodiment, the practical application or technical improvement over technologies found in the marketplace, or to enable others of ordinary skill in the art to understand the embodiments disclosed herein.

I/WE CLAIM:

1. A method for providing virtual shopping facility comprising:

   receiving customer authentication data from a user at a local device to perform a task;

   determining that the user is authorized to perform the task based on the customer authentication data;

   responsive to determining the user is authorized, associating the customer authentication data with a tagged wearable device and a tagged mobility device with the user;

   transmitting release instructions to the local device to release the tagged wearable device and the tagged mobility device to the user;

   receiving an indication that the user is wearing the tagged wearable device;

   receiving another indication that the user is entering a shopping facility using the tagged mobility device;

   receiving a user instruction to capture an image causing the tagged wearable device to capture the image;

   identifying a bar code in the image; determining, by the one or more processors, an item based on the bar code;

   generating a user prompt requesting an item quantity;

   updating a database with the item quantity;

   transmitting an action instruction to the tagged mobility device to retrieve the item and secure the item; and

   receiving a third indication that the user has completed the task.

2. The method as claimed in claim 1, receives a fourth indication that the tagged wearable device was deposited at the local device.

3. The method as claimed in claim 1, generates, an invoice based at least on the item, the item quantity, and the customer authentication data; providing to the user; and processing payment information received from the user.

4. The method as claimed in claim 1, wherein the customer authentication data is received by scanning a customer card programmed with user data associated with the user.

5. The method as claimed in claim 1, wherein the tagged device is an augmented reality (AR) wearable smart device.

6. The method as claimed in claim 1, wherein the tagged mobility device is a robotic shopping cart attached with a robotic arm for selecting items from the shopping facility.

7. A system for providing virtual shopping facility comprising:

   plurality of processors;

   one or more computer readable storage media; program instructions collectively stored on the one or more computer readable storage media for execution by at least one of the one or more computer processors, the stored program instructions comprising program instructions to perform a method comprising: receiving customer authentication data from a user at a local device to perform a task;

   determining that the user is authorized to perform the task based on the customer authentication data; responsive to determining the user is authorized, associating the customer authentication data with a tagged wearable device and a tagged mobility device with the user;

   transmitting release instructions to the local device to release the tagged wearable device and the tagged mobility device to the user; receiving an indication that the user is wearing the tagged wearable device;

   receiving another indication that the user is entering a shopping facility using the tagged mobility device;

   receiving a user instruction to capture an image causing the tagged wearable device to capture the image;

   identifying a bar code in the image; determining an item based on the bar code; generating a user prompt requesting an item quantity;

   updating a database with the item quantity; transmitting an action instruction to the tagged mobility device to retrieve the item and secure the item; and

   receiving a subsequent indication that the user has completed the task.

8. The system as claimed in claim 7, receives, by at least one of the plurality of processors, a subsequent indication that the tagged wearable device was deposited at the local device.

9. The system as claimed in claim 7, generates, by at least one of the plurality of processors, an invoice based at least on the item, the item quantity, and the customer authentication data; providing, by the one or more processors, to the user; and processing, by the one or more processors, payment information received from the user.

10. The system as claimed in claim 7, wherein the customer authentication data is received by scanning a customer card programmed with user data associated with the user.

02nd Day of November 2021

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Authorized Patent Agent for the Applicant

ABSTRACT

VIRTUAL SHOPPING FACILITATION MODULE ASSOCIATED WITH ROBOTIC CART AND AUGMENTED REALITY (AR) GLASSES

The disclosed method and system provides an approach for facilitating users in selecting items and/or products via virtual shopping by associating a robotic shopping cart and an augmented reality (AR) device with the users for enabling contact-less shopping. The disclosed system implements the method for receiving customer authentication data from a user and associating the customer authentication data with a tagged wearable device and a tagged mobility device with the user. The method further includes receiving an indication the user is wearing the tagged mobility device, and that the user is entering a shopping facility using the tagged mobility device. The method further includes receiving a user instruction to capture an image causing the tagged wearable device to capture the image, determining an item and transmitting an action instruction to the tagged mobility device to retrieve the item and secure the item.
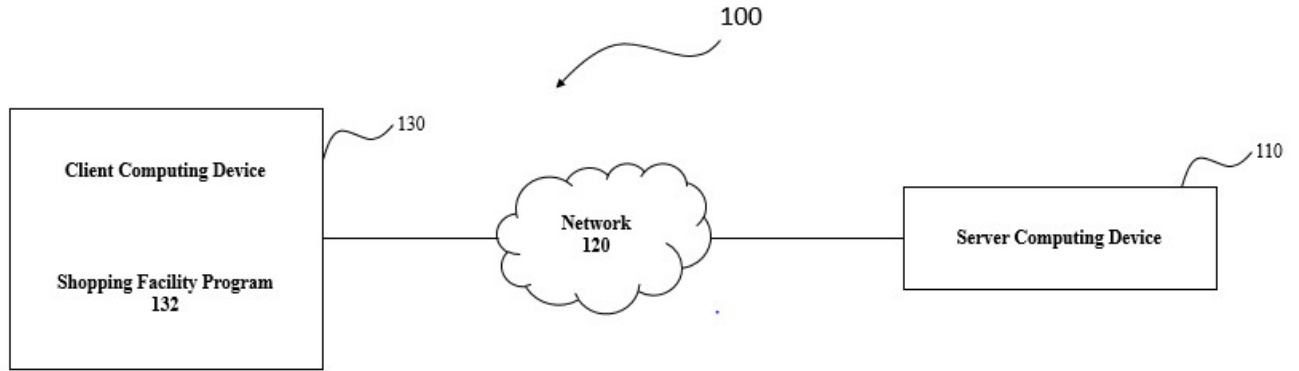
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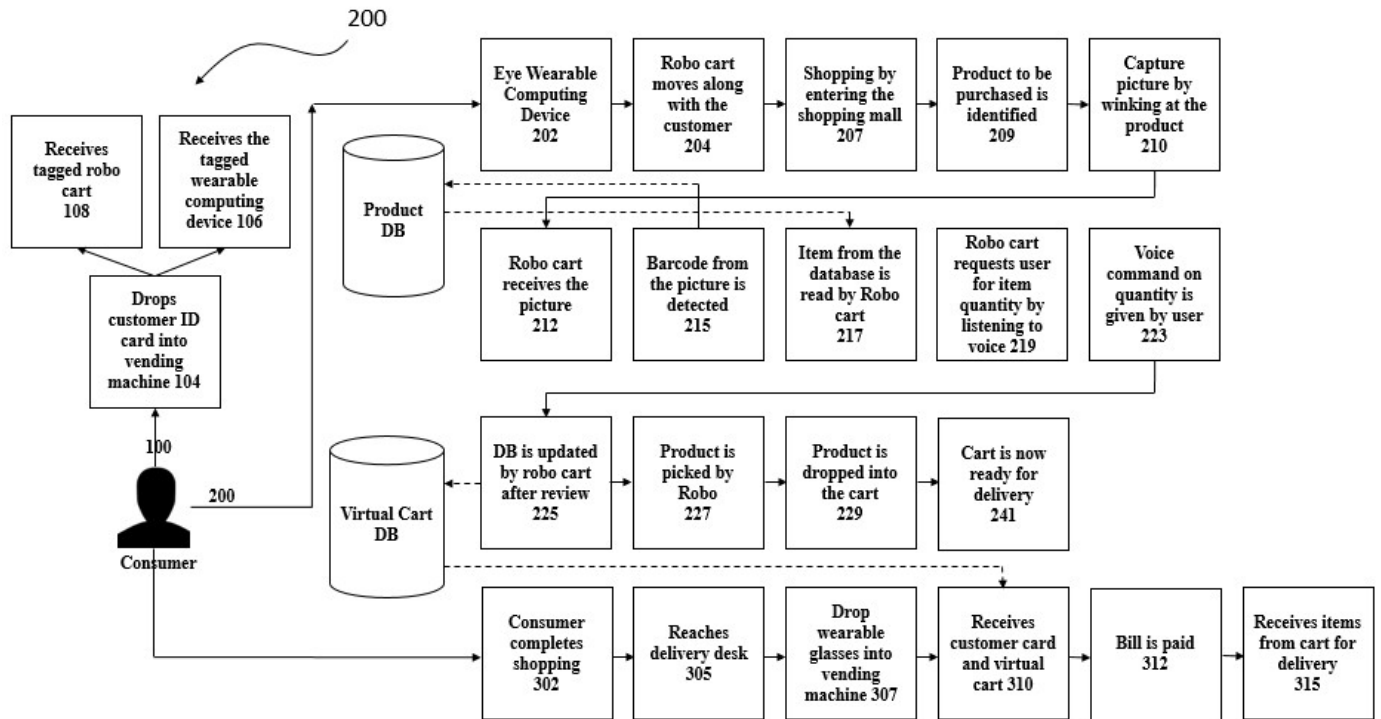**FIG. 1**

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FIG. 2

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Store Location	Select Item	Shopping Cart
AISLE 10 BAY 2 ⊗	Vegetables Water Bottles Fruits Bread	Chicken 4 INR Rice 3 INR Bread 6 INR Banana 4 INR Sub Total 17 INR
Click for Maps		Checkout

FIG. 3

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FIG. 4
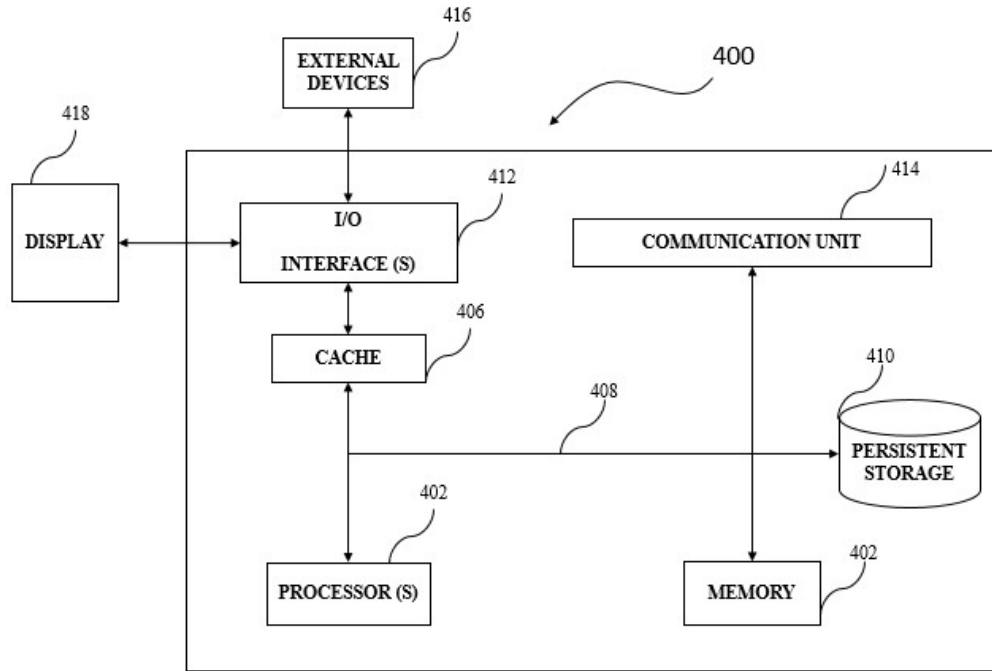
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