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Integrating verbal collaboration platforms with data collection and user context

Abstract

In a method of managing emergency management information within an observation platform an emergency management and response application is provisioned at an observation platform. The provisioning is administered by a cloud services platform and includes configuration and deployment of the emergency management and response application within the observation platform. In response to receipt at the observation platform of a report of an emergency, operation of the emergency management and response application is triggered within the observation platform. Emergency management information is sent, via the emergency management and response application, to a group of users of the observation platform.

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Field of Classification Search

USPC: None

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Primary Examiner: Jacobs-Burton; Lashonda

Background/Summary

CROSS-REFERENCE TO RELATED U.S. APPLICATIONS—CONTINUATION (1) This application is a continuation of and claims the benefit of patent application Ser. No. 18/089,893, now U.S. Pat. No. 11,900,302, entitled “PROVISIONING AND OPERATING AN APPLICATION FOR STRUCTURED COMMUNICATIONS FOR EMERGENCY RESPONSE AND EXTERNAL SYSTEM INTEGRATION,” by Christopher N. Todd et al., with filing date Dec. 28, 2022, which is herein incorporated by reference in its entirety. (2) Application Ser. No. 18/089,893 is a continuation of and claims the benefit of patent application Ser. No. 17/371,332, now U.S. Pat. No. 11,599,843, entitled “CONFIGURING, DEPLOYING, AND OPERATING AN APPLICATION FOR STRUCTURED COMMUNICATIONS FOR EMERGENCY RESPONSE AND TRACKING,” by Christopher N. Todd et al., with filing date Jul. 9, 2021, which is herein incorporated by reference in its entirety. (3) Application Ser. No. 17/371,332 is a continuation-in-part of and claims the benefit of patent application Ser. No. 16/786,021, now U.S. Pat. No. 11,257,021, entitled “OBSERVATION PLATFORM USING STRUCTURED COMMUNICATIONS FOR GENERATING, REPORTING AND CREATING A SHARED EMPLOYEE PERFORMANCE LIBRARY,” by Christopher N. Todd et al., with filing date Feb. 10, 2020, which is herein incorporated by reference in its entirety. (4) Application Ser. No. 16/786,021 is a continuation of and claims the benefit of then patent application Ser. No. 16/195,555, now U.S. Pat. No. 10,558,938, entitled “OBSERVATION PLATFORM USING STRUCTURED COMMUNICATIONS FOR GENERATING, REPORTING AND CREATING A SHARED EMPLOYEE PERFORMANCE LIBRARY,” by Christopher N. Todd et al., with filing date Nov. 19, 2018, which is herein incorporated by reference in its entirety. (5) Application Ser. No. 16/195,555 is a continuation of and claims the benefit of the then patent application Ser. No. 15/470,235, now U.S. Pat. No. 10,134,001, entitled “OBSERVATION PLATFORM USING STRUCTURED COMMUNICATIONS FOR GATHERING AND REPORTING EMPLOYEE PERFORMANCE INFORMATION,” by Christopher N. Todd et al., with filing date Mar. 27, 2017, which is herein incorporated by reference in its entirety. (6) Application Ser. No. 15/470,235 claims priority to the then provisional patent application, Ser. No. 62/314,106, entitled “OBSERVATION PLATFORM USING STRUCTURED COMMUNICATIONS FOR GENERATING, REPORTING AND CREATING A SHARED EMPLOYEE PERFORMANCE LIBRARY,” with filing date Mar. 28, 2016, which is herein incorporated by reference in its entirety. (7) Application Ser. No. 15/470,235 is a continuation-in-part application of and claims the benefit of the patent application Ser. No. 14/869,167, now U.S. Pat. No. 10,069,781, entitled “OBSERVATION PLATFORM USING STRUCTURED COMMUNICATIONS WITH EXTERNAL DEVICES AND SYSTEMS,” with filing date Sep. 29, 2015, which is herein incorporated by reference in its entirety. (8) Application Ser. No. 15/470,235 is a continuation-in-part application of and claims the benefit of patent application Ser. No. 15/375,725, now U.S. Pat. No. 9,928,529, entitled “OBSERVATION PLATFORM FOR PERFORMING STRUCTURED COMMUNICATIONS,” with filing date Dec. 12, 2016, which is herein incorporated by reference in its entirety. (9) Application Ser. No. 15/375,725 is a continuation application of and claims the benefit of patent application Ser. No. 14/320,356, now U.S. Pat. No. 9,542,695, entitled “OBSERVATION PLATFORM FOR PERFORMING STRUCTURED COMMUNICATIONS,” with filing date Jun. 30, 2014, which is herein incorporated by reference in its entirety. (10) The application with Ser. No. 14/320,356 is a continuation-in-part application of and claims the benefit of patent application Ser. No. 13/401,146, now U.S. Pat. No. 8,948,730, entitled “OBSERVATION PLATFORM FOR USING

STRUCTURED COMMUNICATIONS," with filing date Feb. 21, 2012, which is herein incorporated by reference in its entirety. (11) The application with Ser. No. 13/401,146 claims priority to the provisional patent application, Ser. No. 61/445,504, entitled "ENABLING A RETAIL SALES/SERVICE PROVIDER TO INTERACT WITH ON-PREMISE CUSTOMERS," with filing date Feb. 22, 2011, which is herein incorporated by reference in its entirety. (12) The application with Ser. No. 13/401,146 also claims priority to the provisional patent application, Ser. No. 61/487,432, entitled "ACTIVITY COORDINATING ASSOCIATE'S AUTOMATIC SERVICE ASSISTANT," with filing date May 18, 2011, which is herein incorporated by reference in its entirety. (13) The application with Ser. No. 14/320,356 is a continuation-in-part application of and claims the benefit of patent application Ser. No. 13/665,527, entitled "AUDIBLE COMMUNICATIONS FOR QUERIES WITH INFORMATION INDICATIVE OF GEOGRAPHIC POSITION," with filing date Oct. 31, 2012, which is herein incorporated by reference in its entirety. (14) The application with Ser. No. 15/375,725 is also a continuation-in-part application of and claims the benefit of patent application Ser. No. 13/665,527, entitled "AUDIBLE COMMUNICATIONS FOR QUERIES WITH INFORMATION INDICATIVE OF GEOGRAPHIC POSITION," with filing date Oct. 31, 2012.

BACKGROUND

(1) Retailers are under constant pressure to cut costs, improve margins, and increase floor traffic and customer satisfaction. This has always been so, but the rise of the internet, available at home and while mobile, has increased the pressure greatly. Loyalty programs and per-customer pricing, such as special discounts, are one set of tools used in the past, and used more today. Moreover, there is an increased demand to manage and train associates and provide an increased measure of customer satisfaction in a retail environment. The shift to online buying and services is also putting pressure on brand images as bricks-and-mortar business must have clear brand awareness to retain customers in the newly fluid environment. Such concerns also extend to situations and environments besides retail settings.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) FIG. **1**A illustrates a block diagram of an example environment for an observation platform for structuring a communication in accordance with embodiments of the present technology.
(2) FIG. **1**B illustrates a block diagram of an example environment for connecting observation platforms through external networks and for extending observation platforms to external systems
(3) FIGS. **2**A and **2**B illustrate a block diagrams of an example environment for application deployment, configuration control, and updates within one or more observation platforms.
(4) FIG. **3** illustrates how the software on an observation platform is distributed, updated, configured, and controlled using cloud services and portals into the system computer.
(5) FIGS. **4**A-**4**B show a flow diagram illustrating the process flow for an example method of managing structured communications within an observation platform.
(6) FIGS. **5**A-**5**D show a flow diagram illustrating the process flow for an example method of managing emergency management information within an observation platform, according to various embodiments.
(7) FIGS. **6**A-**6**B show a flow diagram illustrating an example method of observation platform collaboration integration, according to various embodiments.
(8) FIGS. **7**A-**7**C show a flow diagram illustrating an example method of observation platform buy-online-pickup-in-store integration, according to various embodiments.
(9) The drawings referred to in this description of embodiments should be understood as not being drawn to scale except if specifically noted.

DESCRIPTION OF EMBODIMENTS

(10) The present technology provides structure to the communications and Internet of Things (IOT) connections so that the user community is more capable of performing their jobs and more consistent in representing the enterprise. The Observation Platform becomes the core of the connection and establishes the structure between people, groups, machines, IoT devices and external computer systems.

(11) Reference will now be made in detail to embodiments of the present technology, examples of which are illustrated in the accompanying drawings. While the technology will be described in conjunction with various embodiment(s), it will be understood that they are not intended to limit the present technology to these embodiments. On the contrary, the present technology is intended to cover alternatives, modifications, and equivalents, which may be included within the spirit and scope of the various embodiments as defined by the appended claims.

(12) Furthermore, in the following description of embodiments, numerous specific details are set forth in order to provide a thorough understanding of the present technology. However, the present technology may be practiced without these specific details. In other instances, well known methods, procedures, components, and circuits have not been described in detail as not to unnecessarily obscure aspects of the present embodiments.

(13) Unless specifically stated otherwise as apparent from the following discussions, it is appreciated that throughout the present description of embodiments, discussions utilizing terms such as “analyzing,” “collecting,” “communicating,” “communicatively coupling,” “controlling,” “delaying,” “delivering,” “deriving,” “detecting,” “determining,” “disabling,” “enabling,” “escalating,” “establishing,” “executing,” “gathering,” “generating,” “identifying,” “inhibiting,” “interacting,” “making,” “moderating,” “modifying,” “providing,” “provisioning,” “receiving,” “recognizing,” “recording,” “relaying,” “remotely provisioning,” “reporting,” “responding,” “scheduling,” “sending,” “selecting,” “setting up,” “specifying,” “storing,” “suspending,” “synchronizing,” “tracking,” “triggering,” or the like, refer to the actions and processes of a computer system, or similar electronic computing device. The computer system or similar electronic computing device, such as a wearable device, telephone, smart phone, tablet computer, or handheld mobile device, 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. Embodiments of the present technology are also well suited to the use of other computer systems such as, for example, optical, quantum and mechanical computers.

(14) A user or users, as referred to herein, may be a person or people such as, sales associates, employees, managers, trainees, trainers, doctors, clinicians, patients, customers, cleaners, service personnel, emergency responders, hospitality personnel, etc. In one embodiment, the user interfaces with a device for communications with other users or interactions with external systems. Such a device may be a handheld device, a wearable device, a headset, a smartphone, a tablet, an IoT device, an earpiece, a radio, a computer system, or other device capable of providing communications across the network. Such users may be part of the enterprise operating the observation platform or they may be external to the operating entity (e.g., customers, shoppers or visitors) and desire access to users, information, alerts, alarms, or control of devices or external systems within the attached data network. Users may be identified directly via a screen-based application, via a spoken identification phrase, or via indirect identification using signals, behaviors and historical logs to infer the identity of the user. Some users may remain anonymous while they interact with the system.

(15) Customers or visitors may refer to anyone within the environment of an observation platform who are not directly connected to the observation platform system but may do so by using the wearable devices or other applications (apps) designed to connect by permission and arrangement

directly with the observation platform. In one embodiment, customers or visitors may refer to individuals who are purchasing or shopping for items or services in store or hospitality environment, past customers, potential customers, perspective customers, shoppers, browsers, or others who enter the store environment as a potential client and not with the same operational access an employee does.

(16) In one embodiment, the computer system can determine geographic locations of users based on information received from communication devices associated with the users. The geographic location data may be stored as data associated with a user's device at a particular time, or as a performance metric, or may be combined with other information to generate a performance metric. The geographic information may also be used by managers to manage or train associates, or to improve customer service by assuring employees are in the optimal locations at a given time.

(17) A performance metric may also be a metric, a key performance indicator (KPI), or a business metric. A metric or performance metric as referred to herein may be any type of data associated with or derived from a communication between users, including the location of the communications device, or the words spoken and the context of the device or user at the time of a particular communication event. In one embodiment, the computer system is able to generate a visual representation of metrics. For example, the visual representation may be a map of the geographic location of the users in an environment or may visually demonstrate the availability status of a user. In another example, the visual representation may be textual information such as the number of communications sent by a user or the length of time it took for a user to respond to a communication request or alarm. The performance metrics may be sent or displayed to a manager or other user for use in making decisions. The performance metrics may be used by the manager to improve and/or adjust customer service in a retail setting by taking actions such as reprimanding or rewarding an associate or noticing that no associates are located near a group of customers. Performance metrics may also generate real-time alarms or notifications that an action or coordination is needed.

(18) The present technology provides for many examples of how an observation platform may be used in various environments for a variety of purposes. The systems, platforms, and methods may include some, or all of the hardware, software, applications, and firmware components discussed herein and in some embodiments may include alternative or additional hardware, software, applications, and firmware components.

(19) Action Control and Data Aggregation Using an Observation Platform

(20) With reference now to FIG. **1**A, a block diagram of a single observation platform showing environment **100-1** for enabling communications. Environment **100-1** includes devices **105** (**105-1**, **105-2**, **105-3**, etc.), radio base station **115-1**, computer **120-1**, database **125-1** and network **135-1** are illustrated environment **100-1** comprises components that may or may not be used with different embodiments of the present technology for an observation platform and should not be construed to limit the present technology. Each different device **105** is associated with its own different user **106**. For example, device **105-1** is associated with user **106-1**; device **105-2** is associated with user **106-2**; and device **105-3** is associated with user **106-3**. For purposes of brevity and clarity, only three devices **105** and their associated users **106** are illustrated. it should be appreciated that there may be greater or lesser numbers in an environment **101** of an observation platform. Some or all of the components of environment **100-1** may be described as an observation platform for structuring a communication. Reference to a retail setting is used for clarity in the descriptions and it is understood that the technology is not limited to a retail setting and could be applied in any enterprise or group environment where employees, visitors or people benefit from structured communication.

(21) The present technology makes use of communication devices. Radio base station **115-1** and devices **105** may also be described as communication devices. Devices **105** may be user devices that are mobile and employed by a user to communicate with other users via other devices.

Communications between the devices may be described as signals. One more of the devices **105** may be a wearable device, a smart phone, a personal digital assistant, a fob, a handheld device, a headset device or other small electronic device capable of wireless communication. In one embodiment, one or more or devices **105** employ speakers and/or microphones with one or more control buttons for audible communications. The control button(s) may be pressed to signal actions, push-to-talk buttons, volume control buttons, and power on/off buttons or other standard buttons and/or may be options on a touch screen. One or more of devices **105** may be handheld, may be worn around the neck, and may be a headset worn on the head or behind the ear or otherwise interface with the human body. One or more of devices **105** may or may not comprise a screen or display such as a liquid crystal display (LCD). In one embodiment, at lease one device **105** (e.g., **105-2**) does not contain a display so that a user is not inundated with too many options or too much information from the device. A user device **105** without a display may simplify communications and thus allow heads-up awareness and presence in the environment. Another user, such as a customer or visitor, may be more likely to employ a specialized device if the human interface is simplified, or, alternatively, a smartphone device that they bring into environment **100-1**.

(22) Devices **105** and other devices may be brought into environment **100-1** by the user or issued by the enterprise hosting the observation platform. For example, in a retail setting, associates, employees, managers, and the like may be issued devices by the employer or owner of the retail setting. Customers in the retail setting may also be issued devices as they enter the retail setting, or they may use their personal smart devices to access the observation platform. Customers or visitors may choose whether or not to accept the device or whether or not to use the device after accepting it. The employee devices and the customer devices may or may not be the same type or model of devices. Alternatively, the customer or visitor may bring a device into the retail setting such as a smartphone. The customer may download an application to the smart phone that will allow the customer to use the device for communications in the observation platform in accordance with present technology. The customer may remain anonymous or may elect to identify themselves. In one embodiment, recognition of the customer's identity is not required for additional services or offers.

(23) Radio base station **115-1** may be a communication device that is capable of communicating wirelessly with devices **105**. Radio base station **115-1** may simply be a component of computer **120-1** or may be a standalone device that is coupled with, connected to, or otherwise associated with computer **120**. Radio base station **115-1** and computer **120-1** may be physically adjacent to one another or may be separated by a distance (e.g., in a local server room or in a distant cloud services computing center). Computer **120-1** is able to receive communications from radio base station **115-1** and to send communications to radio base station **115-1** for radio base station **115-1** to transmit the communication to its destination. Some environments **100** may employ a plurality of radio base stations **115** as wireless access points that are networked and coupled to computer **120-1** in a manner that extends the coverage footprint versus using a single radio base station **115-1**.

(24) Computer **120-1** may be a desktop computer, a server computer, a cloud-based computer or other standard computing system or may be custom built for the present technology. Computer **120-1** is a computer system with a processor and memory and is capable of executing commands, software and firmware. Computer **120-1** provides the operating system, a portion of the memory, and the connectivity tools for linking to the radio base station via an internal network. Computer **120-1** may also connect to an external network **140** (e.g., a private network or the Internet) for the purpose of connecting to additional observation platforms or to connect to external cloud services for configuration control and/or software or application access. Computer **120** runs one or more applications that provide the end-user and management results.

(25) Radio base station **115-1** and devices **105** employ standard techniques for communicating wirelessly. The communications may be performed using radio techniques such as near field communications, short wave radio, infrared, Bluetooth, Wi-Fi, cellular radio, 4G or 5G data

communications, standard wireless computer network protocols, etc. In some embodiments, devices **105** are able to communicate with each other directly or through radio base station **115-1**.
(26) In some embodiments, within the observation platform environment **100-1**, devices **105** communicate with each other via computer system **120-1**. In one embodiment, for example, all communications in environment **100-1** are relayed through radio base station **115-1** and computer **120-1** which acts as a central hub. For example, device **105-1** may communicate with device **105-2** by device **105-1** sending a communication to radio base station **115-1**, after which computer **120-1** interprets the communication and derives that device **105-2** is the destination for the communication and then relays the communication to device **105-2** via radio base station **115-1**. This may occur automatically and quickly enough such that the users will not experience any undue lag in communications. In one embodiment, devices **105** may communicate directly with computer **120-1** (via radio base station **115-1**) rather than with another device **105**. For example, a user **106** associated with device **105-1** may issue a command to computer **120-1** via device **105-1**, or computer **120-1** may send information to device **105-1**. Information sent from computer **120-1** to device **105-1** may be an audible signal or may be visual, textual, contextual, geographical, or graphical data to be displayed at device **105-1** if it is properly equipped to do so. Computer **120-1** may extract data and information from the signals received by the radio base station **115-1**.
(27) In one embodiment, devices **105** may communicate with one another directly, and their signals may be monitored and processed by computer system **120-1** via a monitoring system associated with the radio base station **115-1**. For example, radio base station **115-1** may monitor a transmission sent from device **105-1** to device **105-2**. Instructions or commands may still be directed towards the computer system **120-1** and computer **120-1** may extract data and information from the direct signals.
(28) In one embodiment, computer **120-1** is able to recognize a user sending a communication. The user may be recognized based on the device used to send the communication to computer **120-1** and radio base station **115**. For example, device **105-1** may have a unique signature associated with its transmissions such that radio base station **115-1** or computer **120** can differentiate the device **105-1** from another device such as device **105-2** or device **105-3**. In this manner, the user **106-1** of device **105-1** may be recognized by computer **120-1**. Such recognition of a user (e.g., user **106-1**) may then be employed by computer **120-1** for future communications with that device, with other devices, and/or for data collection (e.g., for attribution of collected data from a device **105** to a particular user associated with the device).
(29) In one embodiment, the signal or communications between devices and/or computer systems are encrypted. The signal may be encoded such that it is unique to a specific device **105** (e.g., unique to device **105-1**). The encryption or encoding may be employed by computer **120-1** to recognize the user of the device. In one embodiment, the user of a device **105** may identify himself to the computer system **120-1** and the computer system **120-1** makes the association between user identification and device **105**'s internal electronic identification (e.g., an identification of user **106-1** may be associated with device **105-1**). Encryption may also be enabled to any external network connections such as external network **140**.
(30) Computer **120-1** may determine that the destination of a communication is a single device, a plurality of devices, or an external system. Thus computer **120-1** may relay a communication from device **105-1** only to device **105-2** or may relay it from device **105-1** to both device **105-2** and device **105-3**. Computer **120-1** may determine that another user device is the destination of a communication originated by device **105-1** but may also directly respond to the communication by executing a command or sending a communication back to device **105-1**. In one embodiment, a communication from a device **105** has more than one characteristic or aspect. For example, and with reference to device **105-1**, the communication may have a first characteristic that corresponds to an audible source such the words spoken by user **106-1** employing device **105-1**. The communication may additionally or alternatively have a second characteristic containing contextual

information such as engaged, available, listening to information, returning to coverage zones, alarms, or other behavioral and/or contextual information. The communication may additionally or alternatively have a third characteristic that comprises geographical position information of device **105-1** or may have information indicative of a geographic position of device **105-1**. Computer **120-1** may be able to determine a geographic position and direction of motion of a device **105** from the information indicative of a geographic position of the device **105**. In one embodiment, computer **120-1** may receive location information from external systems and then match the location to a device **105** based on internal logic and policy. The motion of a device **105**, as indicated by cumulated location information, may also be described as path of travel. A characteristic of the communication may be a portion of the communication, data associated with the communication, attributes of the communication, or metadata regarding the communication.

(31) In one embodiment, computer **120-1** comprises a storage medium for storing some or all of the transactions. In some such embodiments, computer **120-1** may store some or all communications between devices in environment **100-1**. Computer **120-1** may store communications for a pre-determined amount of time and may move stored material to the cloud for additional processing or for long-term storage. Different characteristics of the communication may be stored including portions of the communication itself, button presses, responses to requests or alarms, or motions. Additionally, the computer may request and store all audible information regardless if the user presses a push-to-talk button or otherwise signals the need to begin a communication. For example, the communication may comprise an audible portion, a text portion, a context portion, information indicative of a geographical position, and a geographical data portion. The audible portion may also be converted to text. Computer **120-1** may store all or some of the different portions including the portion converted to text or machine-readable language. Computer **120-1** may store geographic position information regarding a device over a period of time such that a path of travel of the user may be inferred. Thus, the position and context of a user may be mapped, tracked or predicted through a physical environment or area.

(32) In one embodiment, computer **120-1** receives a communication from a device with a portion of the communication that corresponds to a voice of the user of the device. Computer **120-1** is able to convert the audible portion to information used by computer **120-1** to derive context information from the communication to determine performance metrics regarding the communication or the behavior of the user of the device. The resulting information may also be interpreted as a command for computer **120-1** to execute depending on the policy or policies resident in computer **120-1** or the applications in operation at the time. The resulting information may also be employed to determine a destination for the communication, or alert, or the action required by the computer as a result of the application running and the interactions of the device.

(33) In one embodiment, computer **120-1** executes a command received from a device **105-1**. For example, the command may be directly received from a device such as device **105-1** or may be received in an audible voice signal which is converted to machine-readable language and then interpreted to be a command for computer **120-1**. The command may be to initiate a virtual voice connection between two or more devices. For example, a command received from device **105-1** may be to initiate a virtual voice connection between device **105-1** and device **105-2**. The command may be to initiate a connection to an external system to query, control or modify the operation of the external system. The command may be for computer **120-1** to store information into or extract information out of database **125-1**. The command may generate an alert or an alarm that is distributed based on the application(s) running on computer **120-1**.

(34) In one embodiment, computer **120-1** is able to access database **125-1** over network **135-1**. Network **135-1** may be a local area network, a wireless network, the Internet or another computer network. In one embodiment, database **125-1** is a component part of computer **120-1** and network **135-1** is not required for computer **120-1** to access database **125-1**. Database **125-1** may comprise an inventory of product or any other type of information. For example, in a retail setting a customer

may use a device to communicate with an associate regarding whether the retail setting has a particular product in stock. The associate may use key terms to query computer **120-1** regarding whether the product is in stock. Computer **120-1** may convert the associate's voice to text and recognize the command regarding whether the product is in stock. Computer **120-1** then queries database **125-1** and sends a response back to the associate and/or customer. The response may be sent back using an audible signal or a signal to be displayed on a screen at the user device. Similar examples may be constructed around product location databases, workforce scheduling systems, on-floor zone assignments, time clock systems, alarm and alert systems, or other information systems used for operations and reporting. Alternatively, computer **120-1** may recognize a command based on the converted text without a user saying key terms.

(35) Database **125-1** may be a local inventory or a larger inventory. In one embodiment, database **125-1** is not an inventory system, but comprises different data. For example, a user may employ the device to communicate with and command computer **120-1** to perform a search of the Internet using a search engine. In another example, the user may employ the device to generate an alarm which is then processed by computer **120-1** in conjunction with the data in database **125-1** to alert the appropriate set of users and external systems. In another example, the database may be a knowledgebase of product, process or technical information. Database **125-1** may be further defined and structured depending on the application(s) running on computer **120-1**.

(36) With reference now to FIG. **1**B, a block diagram is illustrated of a first environment **100-1** plus a second environment **100-2** for structuring communications in an extended observation platform. Environment **100-2** is similar to environment **100-1** but includes devices **105-4**, **105-5**, and **105-6** along with radio base station **115-2**, computer **120-2**, database **125-2**, and internal network **135-2**. Environment **100-2** comprises components that may or may not be used with different embodiments of the present technology and should not be construed to limit the present technology. Some or all of the components of environment **100-2** may be described as an observation platform for structuring a communication.

(37) As illustrated in FIG. **1**B, in one embodiment, first environment **100-1** is communicatively coupled to second environment **100-2** through an external network **140**. The components depicted in the combination of environment **100-1** and environment **100-2** may be described as a connected observation platform.

(38) Environment **100-1** may be described as having a radio range, or span of operating distance and environment **100-2** may be described as having a separate or different radio range. For example, radio base station **115-1** may have a physical limit regarding the distance which it may transmit radio signals. Therefore, a device outside of the radio range, such as devices **105-4**, **105-5** and or **105-6** will not be able to communicate with computer **120-1** via a radio signal transmitted from radio base station **115-1**. Additionally, one or more of devices **105** may also have a limited radio range for transmitting to a radio base station.

(39) These limitations may be overcome by computer **120-1** of environment **100-1** relaying the communication to a second observation platform within environment **100-2** via external network **140**. Therefore, devices **105-1** and **105-2** may communicate with either device **105-4** or **105-5** where the communications are relayed by computer **120-1**, network **140** and computer **120-2** and then from radio base station **115-2** to/from devices **105-4** and/or **105-5**. Environment **100-2** may be described as a second observation platform with components that are duplicates or similar to components of environment **100-1**. Each of the environments **100-1** and **100-2** may comprises any number of communication devices **105** or other components such computers, routers, and transceivers. Thus, the present technology provides for structured or disciplined communications between at least two user devices **105** that may or may not be within radio range of one another or may not be within range of a common radio base station.

(40) In one embodiment, an environment **100** such as environment **100-2** may be communicatively coupled to external systems through external network **141**. The extension of environment **100-2** to

external computer system(s) **150**, external database(s) **160**, and/or cloud-based services **122** comprises an extended observation platform. When environment **100-1** is also connected to either environment **100-2** or is itself coupled to external systems (e.g., **150**, **160**, **122**), environment **100-1** also becomes an extended observation platform. Many observation platforms may be interconnected in this manner, and each observation platform may or may not connect to external systems. Multiple observation platforms can thus be interconnected, each with its own internal or external systems, and each running similar or different programmable policy, and each running similar or different applications. It is understood that observation platforms may be interconnected with various networking and transmission technologies and that external network **140** and external network **141** may be the same network, separate networks using similar technology, or separate networks using differing technologies.

(41) In one embodiment, device **105-4** and/or environment **100-2** may be physically remote relative to radio base station **115-1** of environment **100-1**. For example, all the components shown within environment **100-1** may be located within radio range of one another at a first location, but device **105-4** and environment **100-2** are located at a second location outside of the first location associated with environment **100-1**. These first and second locations may be separated by any length of distance. The second location may be hundreds or even thousands of miles away from the first location or may be less than a mile away but still outside of environment **100-1**. In one embodiment, computer **120-1** and radio base station **115-1** of environment **100-1** are located at a first physical address such as a street address for a building or other physical location, while device **105-2** is located at a second, different physical address along with computer **120-2** and radio base station **115-2**.

(42) In one embodiment, computer **120-1** and radio base station **115-1** are associated with a retail environment and environment **100-1** includes the retail floor as well as an office or other area designated for associates, managers, or employees of the retail environment. However, computer **120-2** and radio base station **115-2** are associated with environment **100-2** which is located at a second retail environment which is distinct from the first retail environment. The first and second retail environments may be related to one another such as both being a franchise of the same business or enterprise. Thus, a customer or associate may be located in environment **100-1** associated with a first franchise, e.g., a first observation platform, and speak with an associate using device **105-3** to a remote a second franchise, e.g., a second observation platform, such as environment **100-2** and device **105-5**. The customer or associate may ask questions regarding the inventory of an item at the second franchise, speak with an associate at the second franchise that has knowledge not known by associates at the first franchise or connect to external systems if environment **100-2** is an extended observation platform.

(43) FIG. **2**A shows an overview of example applications and how they relate to one or more observation platforms and their respective environments, according to various embodiments. In one embodiment, where environment **100-1** and environment **100-2** and other environments **100** (such as environment **100**-N) each comprise separate observation platforms, the present technology is employed to manage and observe the observation platforms. In another embodiment where two or more of the environments **100** (e.g., **100-1**, **100-2**, and/or **100**-N) are communicatively coupled via an external network **140** to form an extending observation platform, the present technology is employed to manage and observe the observation platforms. For example, applications suite **200** in FIG. **2**A may be employed with the observation platforms and their environments and includes a plurality of remotely provisional functional applications. FIG. **2**A illustrates a plurality of example functional applications **201** (routine communications application **201-1**, request and response application **201-2**, performance recognition application **201-3**, daily direction and information application **201-4**, external systems application **201-5**, emergency application **201-6**, internet-of-things control application **201-7**, button response application **201-8**, collaboration application **201-9**, personality application **201-10**, and buy online pickup in store (BOPIS) **201-11**) in application

suite **200**, however some embodiments may include a greater or lesser number of applications **201** in an application suite **200**. Each observation platform may run different applications and/or applications may be configured differently. These applications allow for the scalability of observation platforms such that a single user may have access to the data from a plurality of observation platforms and the ability to send messages to all or some of the devices associated with the observation platforms simultaneously or in a scheduled transmission. FIG. **2**A differs from FIG. **2**B only in that in FIG. **2**A, computer environment **100-1** is depicted with an in-platform computer **120-1**, whereas in FIG. **2**B environment **100-1** is depicted with a cloud-based computer **120**A-**1** which is not in the same geographic vicinity as other aspects of environment **100-1**. It should be appreciated that one or more observation platforms in an extended observation platform may utilize an in-platform computer **120** while one or more other observation platforms may utilize a cloud-based computer **120**A.

(44) Functional application suite **200** provides a set of example applications that may be configured and run on an observation platform. The applications shown in FIGS. **2**A and **2**B are intended to provide examples of existing and planned applications and not intended to comprise a complete listing of possible applications.

(45) In one embodiment, the routine communications application **201-1** may be downloaded and run to structure the communications between individuals, groups of users, and external systems. Routine communications includes the ability to create a private communications channel between individuals, a private communications channel between an individual and a group, a private communications channel between groups, private communications channel between an individual and other users in a given location, and a non-private broadcast communication to all users on one or more observation platforms.

(46) In one embodiment, the request and response application **201-2** may be downloaded and run to structure the communications for a user or external system requesting an action or commitment. The application provides notification to a group of users that some action or commitment is required and then captures the response of a user who steps up to the task. Data and analytics measure the performance of the committed user in addition to all other users who heard the request, but perhaps did not respond.

(47) In one embodiment, the performance recognition application **201-3** may be downloaded and run to structure the communications from a manager, supervisor, peer, or external system to an individual or group in recognition of either outstanding performance or sub-par performance. Data and analytics keep track of any “kudos” or corrections offered.

(48) In one embodiment, the daily direction and information application **201-4** may be downloaded and run to structure the communications outbound from executives, managers, supervisors, or peers allowing all targeted personnel to receive information useful to their daily performance. Outbound information may be retained within the observation platform so that employees who later connect to the system can hear any relevant information. Data and analytics track the outbound information and when, where, and by whom it was received.

(49) In one embodiment, the external systems application **201-5** may be downloaded and run to structure the communications between users and external systems such as inventory systems, IoT systems, camera/video systems, and alarm systems. The observation platform allows users to query external systems and allows external systems to communicate directly to users individually, in groups, in specific locations or in geographic areas. Data and analytics track interactions between users and external systems.

(50) In one embodiment, the emergencies application **201-6** (also referred to as the “emergency management and response application”) may be downloaded and run to structure the communications during an emergency within the enterprise. The emergency application **201-6** may provide directed actions to individuals, groups or specific locations, as well as track responses and share information throughout the extent of emergency.

(51) In one embodiment, the internet of things (IOT) application **201-7** may be downloaded and run to structure the communications between IoT devices and users of the observation platform. Examples of IoT device interactions include lighting control, refrigeration control and alerting, door opening monitors, and timeclock verifications. There is a growing list of IoT devices, and IoT application **201-7** provides the interface between the user and the chosen IoT device.
(52) In one embodiment, the button response application **201-8** may be downloaded and run to structure the communications from buttons, tablets, or other signaling devices so that users are informed and alerted to the action anticipated by a button press of an assigned button or by an alert signal. Button response often results in the form of a request and response action which may be handled by request and response application **201-2** and wrapped with information in the response which is helpful to the user. Data and analytics provide performance information for the system and users of the system.
(53) In one embodiment, the collaboration application **201-9** may be downloaded and run to structure the communications between a remote collaboration application such as Microsoft Teams and the users of the observation platform. The collaboration application **201-9** integrates the functions of a third-party application such as task management or group participation into the normal modes of communication within the observation platform. Data and analytics are collected to verify performance and augment the data routinely collected by the third-party portion of collaboration application **201-9**.
(54) In one embodiment, the personality application **201-10** may be downloaded and run to structure the communications by giving differing types of communications a different personality. For example, an emergency application **201-6** may present a voice that is stern and decisive, while a performance recognition application **201-3** may present a voice that is warm and encouraging. By using the personality application **201-10** to control the sound of a voice, the user is more quickly aware of the type of information being presented and is more response to the urgency required.
(55) In one embodiment, the buy-online-pickup-in-store (BOPIS) **201-11** may be downloaded and run to structure the communications between associates, store systems, and customers. The BOPIS application **2-1-11** may assist in picking and packing of orders, preparing for customer arrival, delivery to customer, and collection of feedback from customers. Data and analytics track the performance of each associate involved in the BOPIS operation as well as the performance of the entire pick and deliver process.
(56) In one embodiment, user **106-1** of device **105-1** interfaces with computer **120-1** to use the present technology to manage, adjust, and/or facilitate communications. Computer **120-1** may determine and display performance metrics or visual representations regarding communications to the user of device **105**. User **106-1** of device **105-1** may then use the performance metrics and visual representations to make decisions. For example, user **106-1** of device **105-1** may be a manager of associates who can identify that a customer has asked for assistance at a given location, but no associates have responded. The manager may then use the present technology to request an associated to assist the customer. In one embodiment, user **106-1** of device **105-1** is able to directly use computer **120-1** and radio base station **115-1** to communicate with other users of other devices **105** by individual identification, location groupings, expert groupings, role groupings, contextual groupings and/or communicate to external systems.
(57) In one embodiment, computer **120-1** derives performance metrics, business metrics, or key performance indicators (KPIs) from the communications between users and/or systems. The metrics may be used to generate visual representations. The metrics and/or visual representations may be employed to make decisions or archived for later review and analysis. The metrics and visual representations may be sent to another computer system or device. A metric may be based on the behavior of a user, such as, the context of the user, information carried by the tone and quality of voice, and the user's spoken or signaled communications.
(58) A sales performance metric may be determined by linking sales with users, measuring busy (or

“engaged with shopper”) times of users, and ascertaining busy status of user. The busy status of a user may indicate that the user is engaged in a communication, a task, assisting a customer or otherwise occupied. A response time metric may also be determined by measuring the time it takes to answer a user's question, or how long it takes to receive assistance after being asking for it. A customer satisfaction metric may also be derived based on the text of the customer's communication. A task performance metric may be determined by measuring the length of time an associate is currently engaged in performing said task, including noting pending and completed tasks. Metrics may be used by a manager to reward good behavior or correct undesired behavior. Additionally, because the communications and other audio information have been recorded, the communications may be used in training as examples. The applications running on each observation platform contain a set of data and primary statistics gathered by the observation platform used for further analysis by the observation platform computer or external systems.

(59) Visual representations may be described as communication traffic intensity maps between users and/or groups such as who talks to whom, how frequently and at what time of day; who asks questions and who responds; who responds to tasks, when and how long it took to respond; and who has listened to which training segments, where they listened and when, who is responding to an alarm condition and how they are responding, who is not responding to an alarm condition and the elapsed time since the notification. Visual representations may also be described as location maps such as, a status of when users indicate that they are engaged, busy or available, when users ask questions; quiet areas where no communications or engagements are occurring; where users are not located; where selling tips were left and by whom; location-based-tasks and the times it takes to complete them; a path of where users have traveled geographically; and a map of the environment. With this observation platform for structuring communications, a more complete observation of many of the events in the interaction between and among all users can be observed, cataloged, stored and analyzed, providing a great deal of useful information to any manager of the overall process or useful to the economics of the enterprise.

(60) Example Operation of an Observation Platform

(61) An observation platform has a primary function of enabling communications and interconnections for users within a geographic region while providing structure and discipline for communications between users, groups and external computer systems. While mediating communications and interfacing with enterprise IT systems, an observation platform may also collects data and statistics from the users and systems; applying processes and procedures to the data to generate analytics; while using and adjusting programmable policy to determine the communications and interactions of external systems, the communication patterns between the users, and the behavior of the system relative to the words spoken or machine interactions. In one embodiment, the analytic outputs may be useful for measuring performance of users, groups (e.g., KPIs for task completion or responsiveness to a request), system adoption, system health, user behavior, relative user behavior, real time employee team behavior, generating alerts or alarms based on the data, responding to alerts or alarms based on the data, and monitoring the user reactions to the alerts or alarms. The analytic output may be used in real-time for directing actions, either programmatically or via human input, or may be cumulative for assessing efficiency, effectiveness and performance of uses, devices or connected systems.

(62) Physically separated observation platforms can be interconnected via traditional networking services such as the Internet or may be connected via private networks or other networking technologies. Interconnected observation platforms are generally transparent to the user experience, although differing processes, policies and/or applications may be invoked at the individual platforms. Interconnection of observation platforms allows users to seamlessly interact with users or systems in different geographies. In one example, such transparent interconnection enables applications such as “expert groups” to seek out the best available talent from a pool of candidates in multiple geographic regions.

(63) Decoding of spoken words through speech-to-text techniques enable the system to respond to verbal communications and/or commands and provides a human-to-machine interface to external systems. The observation platform responds to verbal commands, screen-based commands and controls, and external system inputs. The observation platform may have one or a multiple Application Programming Interfaces (APIs) or gateway functions that allow interconnection to external computer systems such as: IoT devices, paging systems, inventory databases, knowledgebases, call-button systems, Point-of-Sale (POS) systems, vendor specific databases, video analysis systems, door counters, training systems, time-clock systems, task management systems, telephone systems (e.g., Cisco Unified Contact Center Express Computer Telephony Integration (CTI)), asset tracking systems, collaboration platforms (e.g., Microsoft Teams, Cisco WebEX, Google Gsuite, or SLACK, etc.), emergency systems and other computer based systems residing locally, remotely via a network, or in the cloud.
(64) Text-to-speech or direct conversion of computer information to human understandable speech allows the observation platform to respond to the users with information, directions, instruction, and collaboration histories. The observation platform may use differing audio sounds or speaker personalities to assist the user in identifying the type of information exchange in process. System personalities are invoked as method to distinguish for the user the context of the information being presented, or the type of information being requested.
(65) The present technology may employ an architecture with cloud-based and site-based services that allow for the management of one or a plurality of observation platforms. Each environment may comprise any number of users associated with the observation platform including managers, associates, employees, hourly workers, salespeople, security forces, customers, guests, etc. A manager, a user, or an external system may employ the present technology to communicate with or collect data from the observation platform(s) or may use the present technology to hear, see, or deliver messages to the devices associated with the observation platform(s) and the users associated with devices. The messages may be live voice, voice recordings, text-to-speech (TTS) messages, or machine-to-speech messages, visual messages, or haptic messages. Messages may be sent by the user, triggered by the user, heard by the user, or generated by the computer based on device or user behavioral context and current policy.
(66) An observation platform is a system comprised of computer systems and mobile devices that respond to speech commands and/or touch actions. The geography of a single observation platform is bounded by the useful service area of the wireless communication network connected to the relevant computer. A computer may be connected to the communications network within the geography, at a remote location, or in the cloud. Multiple observation platforms may be connected and act in harmony using longer range networking techniques such as fiber optics, cables, microwave links, or the Internet.
(67) Each observation platform is comprised of one or more computer systems used to mediate communications and interactions. The computer **120** that operates the observation platform can run one or more applications (apps) from a library or suite of apps which are used to control the actions and characteristics of the system. Applications and programmable policy are used in combination to control who hears what or who creates what actions in remote systems. The result is that the observation platform provides a structure for communications and control for both the users and for the connected systems.
(68) Using structuring communications in an observation platform, as referred to herein, may refer to the following actions regarding communications between two or more users: disciplining, structuring, controlling, participating, discouraging, encouraging, influencing, nudging, making an example of, permitting, inhibiting, enabling, managing, managing users and/or systems for compliance with policies, measuring what goes on as communication and motion occurs, characterizing, observing, recording, analyzing, correcting, directing, etc.
(69) The structuring or disciplining process envisioned herein involves using communications and

a computer system as a platform to detect commands, interpret those commands, respond to those commands; or interact with users to detect key words in messages, establish two-party and multi-party communications links, pass on messages, archive messages and commands, distribute information to target audiences, issue alerts or alarms, connect with and control external systems, respond to external systems, and relay or generate messages from external systems to target users. Simultaneously, the observation platform system derives data and analytics from interactions, motion and user context permitting an owner or manager to observe, analyze and document a user's or group's actions, interactions, human performance and system performance.

(70) One purpose for structuring or disciplining communications and control is for the users to become better customer service agents and more effective salespeople such as in a retail setting. The present technology accomplishes this goal by monitoring communications, system interactions and physical activities of the users. The monitored information is used to derive context information from interactions such as the voluntary identity of the user, the current state or status of the user (e.g., busy, available, engaged, commanding, conversing, listening, being trained, out-of-range, not logged on, etc.), the role of a user (e.g., manager, associate, register operator, facilities worker, subject matter expert, security personnel, maintenance personnel, etc.). Context information may also be derived by physical characteristics of the device associated with a user such as, location, movement, voice loudness, speech cadence, voice intonations, background sounds, button press durations and counts.

(71) Additional data may be added to the user context through business metrics such as the user's interaction with others, who and how often they interact, characterizations of their communications, user response to system suggestions or nudges, commands issued by the user, and interaction with external systems including responses, actions, productivity measurements, skill assessments, attitude evaluations, voice analysis, or other information relevant to making business and personnel decisions. Context information may be used to determine, for example, the role of the user, the skills of the user, the preferences of the user, or how the user behaves in groups or in the physical environment.

(72) The structuring of communications and system actions is further enhanced by applying programmable enterprise policy. Policy may be applied or adjusted from direct interaction with the local system or via portals into the cloud services systems. Policy is then applied to the current state of the observation platform, the combination of commands being used, external system interactions, and user and/or device context, to determine the target or actions associated with each command or communication. The policy is controlled across the observation platform from a central computer associated with one or more observation platforms. This central computer may reside at any network location such as the enterprise server room or remotely and connected via a network, or in a shared resource such as in the cloud.

(73) Combining communications, context information and programmable policy allows the observation platform to present the user with the most critical information, at the right time, and at the right location.

(74) Applications (Apps) within the Observation Platform

(75) An observation platform creating structured communications and gathering data is ideally suited to the integration of one or more applications that add functionality and/or modifies the policy controlling the communications flow and machine interactions. These applications are designed for and operate within the specialized environment of the observation platform. While the apps may be designed in a general nature and may run under a plethora of operating systems, each application works in conjunction with the methods and technology only found in an observation platform.

(76) One or more applications running on the observation platform are responsible for defining the flow of communications, distribution of alerts or alarms, the data being gathered, and how the platform interacts with external systems. For example, within the set of overall operating

applications is sub-set of applications that define the system behavior during urgent or emergency situations. In these situations, controlling what people hear, knowing where they are located, and using the policies established by enterprise is essential. This particular subset of specialty applications may be referred to as “emergency apps” which are included in the present technology.
(77) Other applications are used to define an interface between users of the observation platform and with external systems. These apps provide a machine-to-machine interface, human-to-machine interface or a machine-to-human interface. One example of a human-machine interface would be a task management system issuing tasks either verbally or in machine language which is converted to audible tasks (or identification of tasks) and sent via policy and context to an individual or group. Then as the tasks are completed and acknowledged by a verbal or touch response from a user, the external task management system is updated via the observation platform computer interface.
(78) Another example application is an interface between users and a third-party collaboration system (messaging and group messaging or discussion) such as Microsoft Office Teams, Cisco WebEX, Google Gsuite, or SLACK, or other text-based and/or video-based collaboration or documentation tools. As text is typed into the screen application, that text is converted to audible speech and played to one or more users as determined by the distribution settings in the third-party collaboration application **329** in conjunction with the policy settings within the observation platform. Conversely, as discussions are held between individuals and/or groups of users, the content of those discussions appear in text on the collaboration application **201**-**9**. Additionally, either the collaboration application **201**-**9** or the observation platform may be used to assign names, define groups or control policy.
(79) The apps running within the observation platform may be used to determine or specify which devices in the selected geography are to receive the message. For example, the controlling app(s) may specify that the message is only to be delivered to devices that are associated with the store manager(s) or may specify that all devices associated with a particular department or specific location are to receive the message. The specification of devices to receive the information may also be based on the context of the devices as determined by one or more of: the identity of the user (if identified) associated with the device, the characteristics of the signals being received by the device, the history of the signals that have been received by the device, the current or prior location of the device, the movement of the device, the current status of the device, or the historical metrics of the device or user associated with the device. In one embodiment, the device may be an external system that is responsive to the message and may be capable of taking further action.
(80) Table 1 shows a non-exclusive set of application examples that may operate within an observation platform. The applications running on the computer controlling the observation platform are not limited to the examples shown in the example table. Additional apps be designed and/or licensed by external companies, developer groups, development organizations, or the enterprise controlling the observation platform.
(81) TABLE-US-00001 TABLE 1 Application Examples Application Title Functional Summary Primary Statistics Routine Creates virtual push-to-talk Source time, source Communications communication channels between location, destination individuals and groups based on IDs, destination commands, context and policy. locations, group IDs, Communications work within message length, observation platforms, throughout volley count, extended observation platforms (see keywords spoken FIG. 2) across multiple observation platforms as determined by user context and policy. Broadcast Push-to-talk goes immediately to a Source time, source single individual, a group, a group in a location, destination selected location, or all users in an IDs, response times observation platform or may extend to by ID, volley count, multiple observation platforms as keywords spoken determined by user context and policy. Ad-hoc Group Uses the broadcast function (above) Source time, source and then allows those who quickly location, destination respond to create a private chat room IDs, response times for the duration of the conversation. by ID, chat duration, Group re-call is included. location of members, keywords spoken, re- call count

with same stats Daily Direction and Assures information is pushed to Type of message, Information users immediately or delayed per time of message policy for individuals, groups, group launch, message roles, or group locations as duration, message determined by command, context and keywords, target policy group, individual listen times, listen-later button presses, location listened. Location Task This application assigns a task to a Time task sent to Management location and the task description is location, location, who heard when an available employee is hears and when, who near the location. The employee may takes the task, time pick up the task or ignore it. The taken, progress report location task is ideal for walk-around times, completion management and measurement of time. employee willingness to complete tasks. Request and Sets up a persistent request message Request type, source Respond for individuals or groups based on time, source location, context and policy in anticipation of a destination IDs, user response. Provides for response location, escalation to other users if response response times by ID, times are excessive as determined by location velocity, policy. Includes API allowing external physical arrival time. system to trigger activities such as “order pick-up”, “customer is waiting in a certain location for product pick- up”, or “customer arrival time is . . . ” Buy Online Pickup An integrated application that reacts to Request time, user in Store (BOPIS) customer arrival information and then IDs notified, user 201-11 informs selected employees that the locations, accepting customer is ready to pick up their user ID, probable order as determined by policy. May customer location, be self-contained in the observation acknowledge time, platform or integrated with an external response time, time- system (see below). to-close, close location. Inventory An application integrated with Internet Time of request, time verification and ordering that triggers an immediate of response, listening hold for pick-up response if a customer desires to user IDs, responding order a product where the inventory user ID, location of database shows that product below response, user speed the safety stock level. For example, to locate, safety stock the application may request a group of level, quantity the associates nearest to the product desired, quantity to verify that the product is actually on found, location found, the shelf so that the internet site can storage location. take the order. Button Response Button type, button name, time of Button name, button 201-8 request, users hearing request (IDs), location, timestamp, user locations, user(s) acknowledging, hearing users, time of acknowledge by user ID, hearing user acknowledging location(s), locations, accepting user, accepting location, accepting time, arrival time, device velocity Performance These applications provide verbal User ID, message Recognition 201-3 recognition for outstanding employee type, message ID, performance as triggered by source of message, observation platform actions or text of message, external system reporting. target employee or Recognition may be at an individual group IDs, level, group level, observation platform level or across multiple observation platforms based on policy and user context. Inventory Query Checks available inventory based on SKU, location, user enterprise database. Application ID, return success, provides information for price(s), return info, speed of quantity on-hand locally or in other response stores, location of inventory, available inventory in other geographies and potential substitutes for SKUs in question Emergency This set of apps is triggered by user Originator ID or Management and command or from an external system origination system, Response 201-6 alert. The alert is verbally presented timestamp, those to users based on their context and hearing IDs, locations system policy. Examples of hearing, action emergency apps include: disruptive requested, visitor, shooter, fire, police, lost child, responding IDs, hazardous condition, medical responding locations, emergency, evacuation, weather alert, responding times, etc. user motions and velocity, time to reach requested location. Training Training apps are used for teaching User ID, training the use of the devices within the module ID, training observation platform or for training attempts, timestamp, users regarding the products, vendors location where or brand messages of the enterprise. attempted, tap-outs, Product training apps may be sold to tap-out locations, tap- suppliers as a separate service. out step ID, training Training may be dynamic and uses the module duration, user's history in conjunction with location where context and policy to deliver training completed. tidbits to the right ears, at the right

time, in the right location. Kudos This application is part of the Type of kudo, value of employee motivation application suite. kudo, location It allows users, external systems or originated, number of managers to create a positive people hearing, incentive message for rewarding location heard employee performance. Personality 201-10 The personality apps change the Personality type ID, sound of the voice or change the tap-outs, timestamp background sound to help the users differentiate the type of service they are interacting with and what actions are expected next. Visitor Connection Visitors to the enterprise may use their Source time, source smartphones or personal devices to location, destination connect to users on the observation IDs, destination platform based on context information locations, group IDs, and enterprise policy message length, volley count, keywords spoken Expert Groups This application responds to a Question asked, question and connects the questioner question type, ask with knowledgeable users. The time, asking user ID, system may be programmed with skill asking location, tables or, using machine learning, may hearing users IDs, determine who is knowledgeable in a hearing user given subject area from responses to locations, response the As-hoc Group app. Experts are times, quality of selected for a question based on response indicator, context and enterprise policy. Mandatory This application requires a clear verbal Request type, source Response response to important messages. time, source location, Failure to respond may result in destination IDs, limiting the user's capabilities within response location, the observation platform or continually response times by ID, reminding the user that a response is recording of verbal necessary as determined by acknowledgment. enterprise policy. Collaborative Allows a seamless integration with an Wordcount Application 201-9 external collaboration platform that lets sent/received, volley Integration (e.g., users read the content of counts, thread Microsoft Teams, conversations taking place on the floor duration, thread Cisco WebEX, and sends audible notes from the member count Google Gsuite, or desktop to the floor. Also allows the SLACK) creation of users and on one platform to automatically synchronize to the other platform. Slot Machine This application connects external Type of action Integration systems such as slot machines to the request, response observation platform so that users are time to request, alerted to machine status and can location of request, interact with the software of the location of responder, external system though voice control history of action and button interactions. request Shoplifting This application allows a single Event start time, command or code to initiate messages location, who to a group or groups of associates that reported, who heard, there is a potential theft problem at a conversation location. The application allows contributors, event coordination of employees through end time audible messages and location tracking. Name This application records the user's Percentage of names Pronunciation name when they logon or respond to a needing Intelligent request and uses the phonetics of modifications, Synthesis their pronunciation to automatically recognition pre and adjust the how the system pronounces post modification, their name and tunes the lexicon for name recognition improved name recognition. accuracy from others, name recognition accuracy from user. Time Clock This application allows integration with Clock in/out times, Integration time-clock systems which provides employee verification users an alternate method of clocking data, in/out or to retrieve information from the time tracking system. The application may inform employees who are on the system that they have not clocked in yet. Task Management The task integration application is Open task list, task Integration capable of presenting tasks to offering group, employees in either a mandatory or accepting employee, voluntary manner, track task progress task start time, task and measure task completion and completion time, task accuracy. accuracy assessment IoT Control Allows Internet-of-Things (IoT) Command issued, IoT Application 201-7 systems and devices to respond to or user response, instructions issued by the observation timestamp, users platform or users of the devices within notified, user IDs, the observation platform. IoT devices user locations and systems can also send information to users for requesting action or providing useful information. Asset Tracking Integrates with third-party applications Last seen timestamp, for tracking of equipment or inventory movement history, within the geography of an observation accuracy estimate, platform. max

velocity, current location Computer Uses the Cisco Unified Contact Center Call arrival time, Telephony Express Computer Telephony notification time, Integration Integration (CTI) protocol to determine users notified, where an incoming call is parked and response time, call alerts a user or group of users based park location, on context and policy of the call responding user, waiting. responding location, length of call. External Systems These applications provide an API call time, involved Integration 327 Application Programming Interface devices or users, (API)or a gateway function that target systems or connects the observation platform to locations, other external computer systems. For metrics relevant to the example, external computer systems external system may be collaboration programs, requests or actions database query programs, time-clock tracking programs, task management programs Content Distribution This application resides partially on Who had heard, who Manager (CDM) the observation platform computer and has not heard, who Application on a website accessible via a “taps-out”, location smartphone or a terminal. The CDM heard, message can distribute messages and length information across multiple observation platforms and is used to target individuals, roles or groups of users.

(82) Table 1 shows a simple title for an application which may not be the commercial name of that application, a brief description how the application interacts with the users or system, and a set of primary or elementary statistics that are gathered and associated with each application. It should be appreciated that additional primary statistics are typically gathered for any application operating within the observation platform. Table 2 shows a non-exclusive list of example “common” primary statistics that are gathered for most all applications. These common primary statistics are in addition to the application-specific primary statistics shown in Table 1.

(83) TABLE-US-00002 TABLE 2 Common Primary Statistics for Applications Source Generated Destination Generated Message Related Stats Stats Stats Device ID Device ID Duration User ID User ID or Group ID Keywords Location Location Target ID's Initiated Time Time notified or played Num and ID of intended recipients Type Time of notification Num and ID of recipients receipt played Duration (if applicable) Length of communication Tap-outs and times listened to % Message listened to −> Intended that did not (Length of listened/ hear Original duration) Listen later Type (broadcast, 1:1, etc.) Tap-out Keywords spoken Response time Number of volleys

(84) An observation platform running the associated applications may be employed in various environments such as retail settings, public-stage floors, outdoor venues, concerts, police scenarios, disaster areas, schools, sporting events, hospitality operations, gaming locations, events, security operations, military operations, a prison organization, customer service, manufacturing organization, factories, schools, warehouses, and other environments where humans gather together and where communications occur between users and/or computer systems. Any reference to any one of these environments in the discussion below, such as “retail settings,” is stipulated to include the entire set of possible environments.

(85) Managing Applications on an Observation Platform

(86) Applications define the details of how the observation platform structures the communications flow, alerts, alarms and interactive behavior of external systems or databases.

(87) The applications primarily reside on the computer controlling the observation platform with only minimal reliance on the software capabilities of the mobile devices. The applications are configured and enabled via a cloud-based central control computer accessed through a URL or directly. This central control computer communicates with the observation platform computer using occasional access via standard network technologies (e.g., Internet) and is used to maintain the operating system, core software, and applications by enabling new software downloads, policy modification, software updates, or error correcting software patches.

(88) FIG. **2**A shows an overview of example applications and how they relate to one or more observation platforms and their respective environments, according to various embodiments. Each application, as shown in functional application suite **200**, is remotely provisionable, meaning the applications is configured, deployed and monitored by the cloud services and configuration control

platform **220** (“cloud services platform”) and the application deployment and updates component **230**. For example, applications may be selected and configured via cloud services configuration and control platform **220**, while application deployment and updates component **230** operates to download the application to computer **120**, device **115**, or other component in the environment **100** associated with an observation system. In some embodiments, application deployments and updates component **230** may be combined or a subcomponent of cloud services and configuration control platform **220**. Suite **200** lists only a fraction of the possible applications hence the list of applications may be longer and more detailed than shown in the diagram.

(89) The applications are loaded to the observation platform computer system **120-1** which may be co-located with the observation platform as shown by environment **100-1** or may be connected remotely to environment **100-1** using a cloud-based computer system **120**A-**1** (as illustrated in FIG. **2**B). Additionally, a plurality of other environments **100** (e.g., **100-1**, **100-2** . . . **100**-N) may exist and some or all may be communicatively coupled to form an extended observation platform.

(90) The functional application suite **200** ranges from simplistic one-to-one communications to full control and interaction with other systems and applications including necessary application programming interfaces (APIs). See Table 1 for a more comprehensive description of some of the example applications and the data gathered with each one.

(91) Application(s) **201** may have pre-existing components resident on the observation platform computer **120-1** or **120**A-**1** of environment **100-1**, or the application(s) **201** may exist separately so that when the application(s) is/are deployed via the application deployment and update component **230**, the designated application(s) interact(s) through the internal API to become active. Since each application is configurable for each observation platform environment, central control is exercised through the cloud services platform **220** for configuration of the application details and the data gathering formats.

(92) Applications may be enhanced and/or updated though the cloud services routines for application deployment and updates component **230**. This arrangement may replace a portion or the whole software program of the designated application. Cloud-based servers are connected to each observation platform through standard networking technologies.

(93) As illustrated in FIG. **3**, the cloud services are accessed via portals at the enterprise **320** or portals with the software owner or licensor **324**. The portals access control over the cloud services via traditional connections over the Internet and/or via private networks. External systems interface **327** operates to couple one or more observation platforms and the components in their respective environments **100** via the cloud services platform **220** with one or more systems **328** and/or applications **329** external to the one or more observation platforms. For example, external (third party) systems **328** may access the cloud services platform, via the external system interface **327**, for: controlling configurations, establishing policy, modifying policy, deploying applications, enabling applications, accessing data, and/or analyzing data Likewise, external (third party) applications **329**, which may be resident on external systems **328**, may also access the cloud services platform for controlling configurations, establishing policy, modifying policy, deploying applications, enabling applications, accessing data, and/or analyzing data via the external system interface **327**. In some embodiments, an external application **329** is an application which provides text-based, speech-based, or video-based collaboration software for facilitating collaboration and communication between users who are remote from one another; some examples of such collaboration software include: Microsoft Teams, Cisco WebEX, Google Gsuite, or SLACK.

(94) With continued reference to FIG. **3** and also with reference to FIGS. **2**A and **2**B, the cloud services and configuration control platform **220** services communicate with the observation platform computer via conventional network connections or the Internet. It is understood that this communication channel may be encrypted, employ proxy nodes, or otherwise implement various levels of data security. The observation platform computer in an environment such as environment **100-1** may be a cloud-based computer **120**A-**1** remote from the geographic scope of other

components of the observation platform or may be a locally resident in-platform computer **120** located within the geographic scope of the observation platform.

(95) The observation platform computer (e.g., **120-1**, **120**A-**1**, **120-2**, etc.) is part of the extended observation platform set (**100-1**, **100-2**, . . . , **100**-N) which depicts one or more relevant observation platform sites, geographies, or collections of components. Within each environment **100** exists the configurations as described in FIGS. **1**A, **1**B, **2**A, and **2**B, including the wireless infrastructure of access points (APs) **115** (e.g., **115-1**, **115-2**, **115-1**A, **115-1**B, **115-1**B, etc.) which may be radio base stations, internal networking devices **135** (such as switches, gateways and routers), mobile devices **105**, and the users **106** of the mobile devices **105**. Also shown in the extended observation platform of FIGS. **2**A and **2**B is the manager application **240**, which is a separate application running on a smartphone or smart device and used in conjunction with the observation platform(s) to communicate, manage and monitor the other devices and systems connected within the observation platform. In one embodiment, the manager application **240** may run on any device which may be owned by the user, enterprise, or system owner.

(96) Other external systems **250** and other external databases **255** may operate within the observation platform for functions such as inventory levels, inventory locations, knowledgebases, task management, time clocks, employee information, point-of-sale data, asset tracking, smart shelves, emergency systems, IoT devices, etc.

(97) With reference again to FIG. **3**, FIG. **3** illustrates how the application software and operating software is maintained and distributed throughout the components of the observation platform.

(98) The cloud services and configuration control platform **220** manages the observation platform applications **350**; stores, modifies and controls how policy **360** is determined and employed plus determines the data collection strategy and analytics management **345**; and allows policy or manual configuration of application options **330**.

(99) The stored enterprise policy **340** in the cloud services and configuration control platform **220** is used to automatically configure parameters in the observation platform of a computer system **120-1** or **120**A-**1** in an environment, such as environment **100-1**, for optimizing the observation platform software along with the application software for most closely meeting the requirements desired by the controlling enterprise. Policy **360**, operating on the observation platform, is determined by a combination of input controls into the cloud services and configuration control platform **220** for defining the details of the policy **360**, while also using the data and analytics of software module **345** to refine the policy **360** using machine learning techniques or Artificial Intelligence. The updated policy **360** is then deployed from stored enterprise policy **340** to the observation platform computer system **120-1** or **120**A-**1** via the cloud services and configuration control platform **220**.

(100) Adjustments to one or more of the custom configurations **330**, enterprise policy **340**, data and analytics **345**, and the observation platform applications **350**, are accomplished via portal access from the system owner portal **324**, the enterprise operator portal **320**, or external computer systems interface **328**. Manual or external adjustments of each application **370** deployed in an observation platform and the parameters controlling the observation platform software **380** via the cloud services configuration and control platform **220** allow each observation platform to behave differently as desired by the owner or controlling enterprise. The external system interface **327** to the cloud services and configuration control platform **220** permits external computer and database systems to change the behavior of the observation platform computer system **120-1** or **120**A-**1** or interact directly with the applications **370** in operation.

(101) The cloud services and configuration control platform **220** is also responsible for downloading changes to the operating system **390**, applications **370**, and other software components. Management of software updates, revisions, maintenance releases, system bios **395**, configuration of hardware **397**, and license validations are performed through the cloud services and configuration control platform **220**. It is understood that the cloud services and configuration

control platform **220** provides automation and easy access to all software changes but is not the only means of making changes in the observation platform computer programs. There are frequently many ways to access and modify software on computers and these means may or may not be available depending on the specific configuration of the observation platform computer(s) by the controlling enterprise or system owner, or the network access requirements.

(102) Example Method of Managing Structured Communications within an Observation Platform

(103) With reference now to FIGS. **4**A-**4**B, flow diagram **400** illustrates an example method of structuring communication within an observation platform, according to various embodiments. Although specific procedures are disclosed in flow diagram **400**, such procedures are exemplary. That is, embodiments of the present invention are well suited to performing various other procedures or variations of the procedures recited in flow diagram **400**. It is appreciated that the procedures in flow diagram **400** may be performed in an order different than presented, and that not all of the procedures in flow diagram **400** may be performed. In some embodiments, procedures of flow diagram **400** may be implemented by one or more processors of one or some combination of computer systems and/or may be stored in a non-transitory computer readable/useable store media (e.g., in a memory, memory device, disk, or the like).

(104) At **410** of FIG. **4**A, responsive to a request interaction, a computer system such as computer system **120-1**, sets up an action request regarding a structured communication in the observation platform (e.g., the observation platform of environment **100-1**) of which it is a component. The request interaction may take any suitable form, some non-limiting examples of which include: a speech or text user command received via a device **105** (e.g., via device **105-1**); a button action from a user received via a device (e.g., via device **105-1**); and/or proximity detection event received via a device **105** (e.g., via device **105-1**), an access point **115**, or computer system **120-1**. In some embodiments, the interaction request may come from a source external to the observation platform, such as from an external system **150** which initiates an action request to the observation platform. The request interaction may specify the type of action that is requested or a particular type of action request may be associated with a particular request interaction.

(105) At **420** of FIG. **4**A, the action request is analyzed with respect to a programmable policy of the observation platform and applications installed on the observation platform. The analysis of the action request may be performed by the computer associated with the observation platform (e.g., with respect to environment **100-1** of FIG. **2**A, computer **120-1** may perform the analysis) or by the cloud services and configuration control platform (FIG. **2**A, **220**) to determine if there is an enterprise programmable policy **360** applicable to the action request. For example, if the action request is to send an announcement to all the stores in a chain, the policy **360** may require that the announcement is first sent to list of approving managers before being disseminated throughout all of the stores.

(106) At **430** of FIG. **4**A, the action request is analyzed with respect to context in the observation platform associated with the action request. In some embodiments, the context is one of user context in the observation platform and device context in the observation platform. The action request may be analyzed by the computer associated with the observation platform (e.g., computer system **120-1** in FIG. **2**A) to determine if context of the users and/or devices are applicable to the action request. At this level, the determination of how to handle the action request may be made by the application, and its configuration, on the computer associated with the observation platform. For example, a chain-wide announcement of a price change for a kitchen item might be constrained to those users **106** who are identified as cashiers, users **106** located near the registers, users **106** who are identified as experts in kitchens, users **106** who are located in kitchens or household goods sections of stores, and/or users **106** who are store managers.

(107) At **440** of FIG. **4**A, the action request is analyzed with respect to status in the observation platform, where the status is one of user status in the observation platform and device status in the observation platform. For example, in some embodiments, the action request is analyzed by the

computer associated with the observation platform (e.g., computer system **120-1** in FIG. **2**A) and evaluated against the user and/or device status for further determination of how to structure the communication. For example, if one or more of the users **106** who are cashiers in the previous example have signaled that they are engaged, the announcement sent to the device(s) **115** associated with those user(s) **115**A may be delayed until they indicate that they are no longer engaged.

(108) At **450** of FIG. **4**A, an action in the observation platform is moderated with respect to the structured communication based on results of the policy, context, and status analyses. For example, the computer associated with the observation platform (e.g., computer system **120-1** in FIG. **2**A) takes into account the prior actions of **420**, **430**, and **440** and moderates a structured communication to one or more devices **105** of the observation platform. This moderation may include: enabling or permitting the structured communication to be sent to certain device(s) **105**, modified the structured communication (e.g., sending it to a device of a different user if a first user is occupied), delaying delivery or play on a device **105** of the structured communication until a later time; or inhibited the structured communication from being sent to or played at one or more devices **105**. Likewise, the structured communication may be moderated, in a similar manner across one or more communicatively coupled observation platforms (see e.g., FIG. **1**B).

(109) Referring now to FIG. **4**B, at **460**, in some embodiments, data from the observation platform is collected in relation to the structured communication. The collected data may be analyzed as it is collected, stored for one or more of analysis, used in making policy decisions, used in making context decisions, and used in formulating one or more reports. The collected data may include one or more primary and/or secondary statistics collected throughout process **400**. The data may include one or both of system performance data and user performance data which may be stored locally in the observation platform which collects it or sent to an external database **160**. The data may be used for analysis of how the action request was handled, which devices and/or users were involved, what happened, when it happened and the circumstances surrounding the action or event. The resulting output may then be used with respect to the observation platform and its environment **100** to tune the programmable policy, adjust the application configurations, interact with external systems, and/or generate reports for key performance measurements (KPIs) or decision making by managers, employees, supervisors, or other users.

Description of Example Applications

(110) Applications, such as application **201** of application suite **200** are used to implement selected features and functions in the environment **100** associated with each observation platform. The following paragraphs provide a description of some of the example applications along with additional details for the example data and statistics that are collected with the use of some of the applications.

(111) Example Method of Managing Emergency Management Information

(112) With reference now to FIGS. **5**A-**5**D, flow diagram **500** illustrates an example method of managing emergency management information within an observation platform, according to various embodiments. Although specific procedures are disclosed in flow diagram **500**, such procedures are exemplary. That is, embodiments of the present invention are well suited to performing various other procedures or variations of the procedures recited in flow diagram **500**. It is appreciated that the procedures in flow diagram **500** may be performed in an order different than presented, and that not all of the procedures in flow diagram **500** may be performed. In some embodiments, procedures of flow diagram **500** may be implemented by one or more processors of one or some combination of computer systems and/or may be stored in a non-transitory computer readable/useable store media (e.g., in a memory, memory device, disk, or the like).

(113) At **510** of FIG. **5**A, in one embodiment, an emergency management and response application **201-6** is provisioned at an observation platform. In some embodiments, the provisioning of the is administered by a cloud services platform such as cloud services and configuration control

platform **220** (FIGS. **2**A, **2**B, and **3**) in collaboration with a computer **120** of the observation platform. The provisioning includes installation, configuration, and/or deployment of the emergency management and response application **201-6** within the environment **100** of the observation platform. For example, as depicted in FIG. **2**A, in one embodiment, an application such as emergency application **201-6** (in a suite of applications **200**) may be provisioned to a computer system **120** of an observation platform to enable emergency management and response via the observation platform and its associated devices **105**. The provisioning comprises installing the application on a computer system (e.g., computer system **120-1**) associated with the environment (e.g., **100-1**) of the observation platform. For example, the emergency application **201-6** (also referred to as the "emergency management and response application") is configured and deployed to the observation platform using the cloud services platform **220** as described in FIG. **3**. Configuring the application may further enable the APIs in the observation platform to connect with external systems or IoT devices for the purpose of exchanging information relative to any urgent or emergency condition.

(114) At **520** of FIG. **5**A, in one embodiment, a communicative connection between the emergency management and response application **201-6** and a system external to the observation platform the observation platform is established. This communicative connection is established via a gateway such as external system interface **327** of the cloud services platform. For example, in some embodiments, the cloud services and configuration control platform **220** provides a communicative coupling/connection to external, third-party, or IoT systems either locally or through the cloud-based gateway function of external system interface **327**.

(115) At **530** of FIG. **5**A, in one embodiment, operation of the emergency management and response application **201-6** within the observation platform is triggered. This triggering is, in one embodiment, in response to receipt at the observation platform of a report of an emergency from either recognizing key words in a speech segment from a verbal command or from an external system.

(116) In some embodiments, one or more users **106** may trigger the operation of the emergency management and response application **201-6** with a verbal command or a textual command sent from a device **105**. In one example, user **106-1** may trigger operation of the emergency management and response application **201-6** by sending a voice command to computer system **120-1** via device **105-1**. In another example, user **106-1** may trigger operation of the emergency management and response application **201-6** by sending a text command to computer system **120-1** via device **105-2**. In another example, user **106-1** may utilize device **105-1** to transmit voice or text information to another device (e.g., device **105-2**), which is routed through and monitored by computer **120-1**. As part of its monitoring role, computer system **120-1**, may trigger operation of the emergency management and response application **201-6** based upon enterprise policy **360** (e.g., policy of a company/organization) which invokes triggering in response to certain phrase words or phrases (e.g., "fire," "robbery," "earthquake," etc.) alone or in context with other data monitored by computer system **120-1**. For example, in one embodiment, if two or more users use the same or similar term (e.g., "earthquake" and "things are shaking") in a specified span of time, then the emergency management and response application **201-6** will be triggered.

(117) In some embodiments, operation of the emergency management and response **206** may be triggered from an external system such as fire alarm system, intrusion alarm system, video analysis system, security system, IoT systems, an emergency weather reporting system, a disaster warning system, or other systems designed to detect and react to urgent or emergency situations. These external systems may be coupled directly to computer system **120-1** of environment **100-1** (e.g., they may be within and part of environment **100-1**) of an observation platform and/or they may be coupled to environment **100-1** and computer **120-1** via external system interface **327**.

(118) At **540** of FIG. **5**A, in one embodiment, emergency management information is sent from the emergency management and response application **201-6**, to one user (e.g., user **106-1**) or a group of

users **106** of the observation platform. The emergency management information includes at least one of an alert related to the emergency and instructions related to the emergency. For example, the emergency alert may say “Tornado Warning” and/or the instructions may be to “proceed to the tornado shelter.” The emergency management and response information may be sent to a device **105** associated with each user **106** being notified.

(119) The alert may contain information regarding the nature of the problem/emergency, the location of the problem/emergency, the location and/or number of users impacted by the problem/emergency, the severity of the problem/emergency; time of occurrence of the problem/emergency, and/or may provide instructions or directions for actions to be taken.

(120) Consider, for example, an emergency involving a person appearing to cause harm with a weapon in a store or hospitality venue. In one such embodiment, the emergency management and response application **201-6** of the observation platform may alert users to the person and provide users with information of the location of the danger and what actions to take.

(121) With reference now to **560** of FIG. **5**B, in some embodiments, the emergency management and response application **201-6** of the observation platform escalates the emergency management information to a larger audience based on a type of the emergency or based on other information. For example, a tornado warning may be broadcast over an intercom or speakers in the environment **100-1** which are communicatively coupled with computer system **120-1**. In another embodiment, the emergency management information may be sent to external systems (e.g., via external systems interface **327**). Some examples of external systems include a 911 emergency reporting system for police, fire, or ambulance response. For example, a robbery may be reported to police first responders; a fire may be reported to fire first responders; and an injury may be reported to medical first responders. In other embodiments, certain additional users may be provided with the emergency management information depending on their location (e.g., in case they may help or need to take evasive action), context (e.g., they have availability to help), status (e.g., owner of the facility in which the emergency is taking place), role (e.g., the person is a manager or supervisor), group (e.g., the user is a security person and a robbery is taking place); membership, function (e.g., the user is trained in first aid and the emergency is medical in nature), or external system purpose.

(122) With reference to the previous example of a person with a weapon, the emergency management and response application **201-6** may also alert an escalation chain of users in other locations, such as remote managers or corporate security forces, through direct connections to external systems. In one embodiment, the external system may directly contact the local police department or an external security firm and inform them of the situation, plus any relevant information contained in conversations or in the data being captured during the event. At the same time, the emergency management and response application **201-6** of the observation platform may request that all employees in the area provide a personal health status, damage or risk assessment, or information regarding injuries.

(123) The escalation may include the emergency management and response application **201-6** adding an increasing number of resources, either user or system resources, if proper responses are not detected from the initial group of users being notified. In one embodiment, the emergency management and response application **201-6** may also notify remote groups such as an enterprise organization or may notify other external systems. One or more escalation stages may be programmed into the system policy controlling the action of the observation platform to the inputs from the emergency application. An alert or request for action may repeat until the acknowledgement is received and accepted by the observation platform. The emergency management and response application **201-6** may invoke features of other applications such as the personality application **201-10** which would change the sound of the system voice to a personality associated with urgent or emergency situations.

(124) In one embodiment, the emergency management and response application **201-6** may distribute instructions for action, such as: a description for use in finding a lost child; a direction to

evacuate a building, possibly including the reason for evacuation and/or a route to take from the location of the user; a direction to shelter in designated locations, possibly including the reason for requiring shelter and the amount of time left before sheltering is required; and/or or to a direction to remain clear of a geographic location possibly including a map showing the geographic location. Users or devices receiving a request for action may be asked for a particular response or acknowledgment assuring that they understood the request. Users or devices may be asked for updates for the current actions taking place or actions planned. In one embodiment, external systems connected with the observation platform, as shown in **250**, may interact with the emergency application in a machine-to-machine manner.

(125) With reference to **560** of FIG. **5**C, in one embodiment, responses of users of the group of users (the group to which emergency management information was sent) are monitored by emergency management and response application **201-6**. For example, user **106** or device **105** locations may be tracked and reported for analysis, generation of new or additional instructions, and delivery of system messages and/or requests to the users **106** or devices **105**.

(126) At **570** of FIG. **5**C, in one embodiment, based on the user responses, emergency management and response application **201-6** determines a status of an overall emergency response (to the reported emergency) in comparison to a default emergency response plan configured into the emergency management and response application **201-6** as part of an enterprise policy on the observation platform. By tracking user responses and/or user/device behavior throughout the emergency situation or event, detailed and individual instructions can be delivered to the users or devices needing to take specific actions. These instructions may be generated automatically based on policy and/or historical data or may involve additional user action. Based on the status, the emergency management and response application **201-6** may take no additional action (if things are going well), send repeated or supplemental emergency management information, and or take escalation actions.

(127) With reference now to **580** of FIG. **5**D, in one embodiment, data and primary statistics are gathered from users of the group of users (e.g., from users of the group of users to whom the emergency management information was sent). In some embodiments data and primary statistics may comprise one or more of: a task name (of an assigned task); a task status (e.g., not started, partially completed, completed, unable to complete, etc.); a timestamp for when a task was offered; a timestamp for when a task was assigned; a timestamp for when a task was accepted; a timestamp for when a task was updated; a timestamp for when a task was completed; location information of one or more users of the group of users; motion and velocity information of one or more users of the group of users; and interactions between users of the group of users (e.g., counts of communications, durations of communications, exchanged textual information, exchanged voice information, proximity information of users of the group of users, etc.).

(128) The emergency management and response application **201-6** may collect data and primary statistics for tracking all users, conversations, commands, and actions during the emergency situation. Examples of such data and primary statistics may include: an originator ID or origination system; a timestamp of the event start; an identification of devices or users hearing the notifications and/or requests; the locations where notifications are heard; the actions requested; responding users; non-responding users; the locations where responding users respond; responding times; user motions to include acceleration, and velocity, and, if applicable; and the time required after notification is received to reach a requested location. All data and primary statistics may be archived and used to develop, modify, or immediately modify the stored enterprise policy **340** controlling the fundamental emergency application **201-6**, or the policy **360** governing the manner in which the emergency application **201-6** runs on the specific observation platform.

(129) The primary statistics can then be post-processed into secondary statistics or analytics to reconstruct the situation; attribute actions to users; send audible messages to users or managers; revise or tune policy affecting the application, and/or adjust enterprise policy **340**, observation

platform policy **360** for how to improve the management and response of the emergency management and response application **201-6**.

(130) Collaboration Integration Application

(131) With reference now to FIGS. **6**A-**6**B, flow diagram **600** illustrates an example method of observation platform collaboration integration, according to various embodiments. Although specific procedures are disclosed in flow diagram **600**, such procedures are exemplary. That is, embodiments of the present invention are well suited to performing various other procedures or variations of the procedures recited in flow diagram **600**. It is appreciated that the procedures in flow diagram **600** may be performed in an order different than presented, and that not all of the procedures in flow diagram **600** may be performed. In some embodiments, procedures of flow diagram **600** may be implemented by one or more processors of one or some combination of computer systems and/or may be stored in a non-transitory computer readable/usable store media (e.g., in a memory, memory device, disk, or the like).

(132) At **610** of FIG. **6**A, in one embodiment, a collaboration application **201-9** is provisioned at an observation platform. For example, the collaboration application **201-9** may be provisioned onto a computer system **120-1** of the environment **100-1** of an observation platform. In some embodiments the provisioning is administered by a cloud services platform **220** in collaboration with a computer system **120** of the observation platform. The provisioning includes configuration and deployment of the collaboration application **201-9** within the observation platform.

(133) Using this collaboration application **201-9**, the observation platform connects to a third-party application **329** (which may be a collaboration application) using a gateway/external systems interface **327** into the system Application Program Interface (API).

(134) At **620** of FIG. **6**A, in one embodiment, an automation software component for resident installation at an external collaboration application is sent from the observation platform to the third-party/external collaboration application **329**. The third-party collaboration application is external to an environment **100** of the observation platform and, thus, may be referred to as an "external collaboration application" or a "cloud-based application." The automation software component is a separate function operating in the external collaboration application **329**, similar to a 'bot,' and may be or include an application program interface (API). The automation software component organizes information existing in the third-party application **329** and allows the third-party application **329** to exchange that information through a cloud-based gateway (e.g., gateway/interface **327**) to the observation platform.

(135) At **630** of FIG. **6**A, in one embodiment, the collaboration application **201-9** is communicatively coupled, via the cloud-based gateway **327**, with the external collaboration application **329** to facilitate communication and information exchange.

(136) At **640** of FIG. **6**A, in one embodiment, user information and task information is synchronized between the collaboration application **201-9** and the external collaboration application **329**. In some embodiments, at least a portion of the user information received from the external collaboration application is provided by the automation software component. For example, in one embodiment, the observation platform collaboration application **201-9** can interconnect with a collaboration application which facilitates sharing text, audio, and video collaboratively between devices/platforms.

(137) In some embodiments, the synchronized user information and task information comprises user information such as: profile information, functions, titles, group memberships, roles, skills, talents, expertise, departmental information, reporting structure, and enterprise hierarchy. In some embodiments, the synchronized user information and task information comprises user information such as: user status information such as: whether the user is currently available for tasking; whether the user is presently engaged in a task; whether the user is currently in a conversation; whether the user is currently listening to messages, whether the user is currently listening to training; whether the user is currently listening to announcements, and whether the user is currently out-of-range. In

some embodiments, the synchronized user information and task information comprises task information such as: available tasks, assigned tasks, task status, task owner, task origination date, task acceptance time, and task completion time.

(138) Some non-limiting examples of such external collaboration applications **329** include: Microsoft Teams, Cisco WebEX, Google Gsuite, or SLACK. By way of example and not of limitation, some example operations are described below with reference to using Microsoft Teams as the external collaboration application **329**. Though Microsoft Teams is utilized as the example third-party external collaboration application, it should be understood that the same or a similar set of operations may be performed with text-based, speech-based, and/or image-based/video-based collaboration applications from other developers and suppliers.

(139) Microsoft Teams is representative of text-based collaboration applications **329** used in many offices and enterprises to coordinate information and activities for the users. The interconnection of external third-party collaboration applications **329** with the observation platform enables frictionless interworking (text-to-speech and speech-to-text) between the interconnected platforms so users on either platform can easily communicate (initiate and respond) between the text-based external application **329** and the speech-based observation platform application. Typing on the text-based external collaboration application **329** may result in the typed words being translated to speech so that users **106** of devices **105** in the observation platform can hear the typed words without referencing a screen. Similarly, words spoken by a user **106** to a device **105** in the observation platform may be translated to text for display on the text-based external third-party collaboration application **329**. Histories of conversations may be retained by either the observation system or the external third-party collaboration application for later playback, analysis and/or reporting.

(140) Integration of the internal and external collaboration applications using the present technology assures synchronization between the external collaboration application **329** operating in the cloud and the collaboration application **201-9** operating within the observation platform as shown. Synchronization provides a cross-linkage of user profile information such as user names, functions, titles, group memberships, roles, skills, talents, expertise, departmental information, reporting structure, and enterprise hierarchy. Using this synchronization operation, users may be added or deleted using either the internal or external collaboration application and all associated information regarding the user would be automatically connected or linked.

(141) In addition to user profile information, the two platforms may exchange user status/state information such as: whether the user **106** of a device **105** is online; whether the user **106** of a device **105** is offline; whether the user **106** of a device **105** is engaged in a task or with a customer; whether the user **106** of a device **105** is in a conversation; whether the user **106** of a device **105** is listening to messages on the device **105**; whether the user **106** of a device **105** is listening to training on the device **105**; whether the user **106** of a device **105** is listening to announcements on the device; and/or whether the device **105** associated with a user **106** is out-of-range of a base station/access point **115**.

(142) The external collaboration application **329** may trigger actions in the observation platform(s) based on the request of the application as structured by enterprise policy on the observation platform and/or addressed by context and status within the observation platform(s) or the corresponding collaboration application **201-9** running on the observation platform.

(143) Another function frequently incorporated into third-party collaboration applications **329** is a task management and tracking process. This task management/tasking process may be extended to the observation platform through the integration and synchronization of the two platforms. In one embodiment, tasks may be assigned using text on the third-party application **329** and be received as speech on the observation platform. Task acceptance and/or completion may then be stated verbally on the observation platform and show as accepted and/or completed on the third-party application **329**.

(144) The request for task action, sent by the external collaboration application **329**, may repeat until the acknowledgement is accepted by the observation platform from the device **105** of a user **106** being targeted for task action. The external collaboration application **329** may invoke features of other applications **201** such as a Personality application **201-10** which would change the sound, volume, or tone of the system voice to portray the voice of a personality associated with urgent or emergency situations.
(145) Each task may be tracked against a planned schedule of completion as determined by the cloud-based third-party external collaboration application **329**. If a task progress report or completion date falls behind the scheduled date/time, the observation platform may provide a notification of a missed milestone and/or escalate the notification to a higher-level set of users or managers.
(146) The external collaboration application **329** may encompass other functions beyond task management. It is understood that the observation platform will expand to encompass other functions and operations via installation of functional applications and communicative couplings to external applications **329** and/or external systems **328**. The synchronization process between the external collaboration application **329** and the observation platform collaboration application **201-9** will enable the exchange of capabilities and information between both applications The synchronization function within the observation platform is designed to allow migration of added functions to the observation platform as the external collaboration application **329** is enhanced.
(147) With reference to **650** of FIG. **6**B, in some embodiments, data and primary statistics are gathered by the observation platform. The data and primary statistics are associated with users **106** and/or tasks. In some embodiments, the observation platform analyzes the gathered data and primary statistics. In some embodiments, the gathered data and primary statistics and/or the analysis results may be provided to the external third-party collaboration application **329** for use in task management and tracking by the external collaboration application **329**. In some embodiments, the results of the analysis may be used within the collaboration application **201-9** or by the external collaboration application **201-9** for verbally or textually nudging compliance or escalating non-compliance with the task or task schedule.
(148) Data may include task data, such as data about: task name; available tasks; assigned tasks; task status (e.g., completed, not completed, nearly completed, not started, not able to complete); task owner; task origination date; task acceptance date; task completion date; a timestamp for when a task was offered; a timestamp for when a task was assigned; a timestamp for when a task was accepted; a timestamp for when a task was updated; a timestamp for when a task was completed; location information of one or more users; and a location, textual, or voice interaction between users of the observation platform. As the data is organized and analyzed by the observation platform, the observation platform may determine that additional communication to the users would be useful or that it is time to request updates or follow-up information for open items or incomplete discussions. In one embodiment, the observation platform may produce visual or verbal reports regarding task status and user performance for evaluation by enterprise personnel or by external systems. In some embodiments, the gathered data and primary statistics and/or the analysis results may be provided to the external third-party collaboration application **329** for use in task management and tracking by the external collaboration application **329**.
(149) In some embodiments, primary statistics are post-processed into secondary statistics or analytics for the purpose of: attributing actions to users; sending audible messages to users or managers; deriving and updating visual or printed reports; revising or tuning application configurations; and/or adjusting enterprise policy **340**, or local observation platform policy **360**, for how to improve the operation and response of the collaboration integration application.
(150) Buy Online Pick Up in Store (BOPIS) Application
(151) With reference now to FIGS. **7**A-**7**C, flow diagram **700** illustrates an example method of observation platform buy-online-pickup-in-store integration, according to various embodiments.

Although specific procedures are disclosed in flow diagram **700**, such procedures are exemplary. That is, embodiments of the present invention are well suited to performing various other procedures or variations of the procedures recited in flow diagram **700**. It is appreciated that the procedures in flow diagram **700** may be performed in an order different than presented, and that not all of the procedures in flow diagram **700** may be performed. In some embodiments, procedures of flow diagram **700** may be implemented by one or more processors of one or some combination of computer systems and/or may be stored in a non-transitory computer readable/useable store media (e.g., in a memory, memory device, disk, or the like).

(152) At **710** of FIG. **7**A, in one embodiment, a buy-online-pickup-in-store (BOPIS) application **201-11** is provisioned in at an observation platform. For example, the BOPIS application **201-11** may be provisioned onto a computer system **120-1** of the environment **100-1** of an observation platform. In some embodiments the provisioning is administered by a cloud services platform **220** in collaboration with a computer system **120** of the observation platform. The provisioning includes configuration and deployment of the BOPIS application **201-11** within the observation platform. As will be discussed, provisioning of the BOPIS application in the observation platform facilitates integration of the observation platform with an existing system used for BOPIS fulfillment by a retailer.

(153) As part of the configuration and deployment of the BOPIS application **201-11** within an observation platform, an initial set of connected associates of a retailer is defined (e.g., an initial set of users **106** to be connected with BOPIS application **201-11** are selected and defined), the locations covered by the initial set of connected associates (i.e., the selected users **106**) and the BOPIS application **201-11** are defined, and the application process steps for implementing the BOPIS application **201-11** are detailed. In one embodiment, the BOPIS application **201-11** is configured to address a set of connected associates (i.e., selected users **106**) by one or more of name (first name, last name, and/or first name+last name, employee number), role (manager, supervisor, facilities agent, security, fulfillment, etc.), group membership (leadership, hardware, frozen goods, BOPIS picking, BOPIS delivery, customer satisfaction), and/or geographic location. The connected associates are a selected group who will be facilitating BOPIS pickups and other BOPIS actions, which may be their exclusive jobs or may be in addition to other jobs or tasks they perform.

(154) Additionally, the process steps are defined in a configuration set-up portal to include steps such as: an external computer system **328**/**160** identifies that an order is picked from the shelves/store of the retailer, assembled (i.e., in one place), and that the customer is on the way to a pick-up location; the external system notifies the observation platform the order is ready; the observation platform requests a single user commitment (i.e., a task request) from the set of connected associates (i.e., the selected users **106**) to take responsibility for getting the order to the customer upon arrival of the customer; a single connected associate (e.g., user **106-1**) accepts responsibility (e.g., by sending a task acceptance message to the BOPIS application **201-11** via voice or text interactive input to their device **105-1**); the connected associate (e.g., user **106-1**) is continuously updated with the arrival information of the customer; the connected associate (e.g., user **106-1**) confirms (e.g., via voice or text interactive input to their device **105-1**) that they are ready to service the customer; the order is delivered to the customer by the connected associate (e.g., user **106-1**); any discrepancies are noted (e.g., via voice or text interactive input to their device **105-1**) between the connected associate (e.g., user **106-1**) and customer; the connected associate (e.g., user **106-1**) closes the BOPIS event (e.g., via voice or text interactive input to their device **105-1**); comments may be logged by the connected associate (e.g., user **106-1**) or from the customer either directly or via an interface to the store computer **328**/**160**. Data and statistics of all interactions are logged a computer system (e.g., computer **120-1**). Cloud services configuration and control platform **220** may store a custom configuration **330**, or may add procedures, delete procedures, or create new or different procedures in a configuration for a particular observation

platform depending on the capabilities of the external systems and the capabilities of the API between the external system(s) and the computer system of the particular observation platform.
(155) Inclusion of the BOPIS application **201**-**11** provides for services which enable efficient delivery of buy-online-pickup-in-store (BOPIS) activities. One of the keys to a successful BOPIS operation is to assure that employees accurately plan task activities, execute tasks as planned, and are directed in support of BOPIS by external computer **160**/**328** and data systems **150** which track BOPIS orders; and that information is gathered regarding how well the associates (i.e., users **106**) are performing and how well the customer is satisfied.
(156) Integrating the BOPIS application **201**-**11** with the store computer system improves speed and flexibility for managing the human activities of the BOPIS operation. By providing task and action information directly to one or more users of the observation platform, BOPIS activities and fulfillment processes can be designed more granularly. For example, using the efficiency of the BOPIS application within the observation platform enables the BOPIS store system **160**/**328** to juggle and switch task priorities based on logical and customer service priorities. Being in immediate contact with all employees using the system even allows re-tasking of non-BOPIS-dedicated employees to jump in for small orders or for peak load relief. In one case, customer service is improved if small orders or urgent orders are dispatched before larger orders that may already be in the queue. Having real-time information regarding the number of associates available for a task, the number of associates engaged in which kind of task, and instant information of task completion allows improved flexibility and decision making for the next action that might improve customer satisfaction or operational performance.
(157) Data and primary statistics are gathered from each portion of the process of flow diagram **700** allowing analysis for measuring individual user performance, group performance of users, store/franchisee performance, chain/franchise-wide performance, and/or system performance. Additional data may be complied from the external store system computer **160**/**328** allowing the generation of overall and detailed performance metrics from the perspectives of customer service; staff-use efficiency, and process efficiency.
(158) The BOPIS application **201**-**11** is used within an observation platform to notify employees that orders are ready for picking, that orders are picked and assembled for customer pick-up, that a customer is on the way to a pick-up location, and/or that the customer has arrived at the pick-up location. Additionally, the BOPIS application may identify and communicate the specific pick-up location, initiate the delivery of the products to the customer, record the time and place the products are delivered, and close the BOPIS task with optional comments or feedback.
(159) At **720** of FIG. **7**A, in one embodiment, automation software component for resident installation at an external collaboration application is sent from the observation platform (e.g., from the BOPIS application **201**-**11**) to the external retailer system **328**, where the external retailer system **328** is external to an environment **100** of the observation platform and, thus, may be referred to as an "external system application" or a "third-party system," or a "cloud-based system." Some examples include a BOPIS system used by a retailer for collecting Internet placed orders for customers and ensuring that stock exists to fulfill these orders at a designated retail location where the customer desires to pick up the items in Internet-placed order. The external retailer system may include a store computer for a retail store, and may include devices which are coupled with the store computer such as store video surveillance camera, store order kiosks, store intercoms, store push button communication terminals, etc. The automation software component is a separate function operating in the external retailer system **328**, similar to a 'bot,' and may be or include an application program interface (API). The automation software component organizes and interfaces with information existing in the external retailer system **328** and allows the external retailer system **328** to exchange that information through a cloud-based gateway (e.g., gateway/interface **327**) to the observation platform.
(160) At **720** interfaces and APIs integrate the observation with the external system(s) **328**, IoT

devices, cameras, push buttons, kiosks or other systems or devices used by the retailer to deliver the BOPIS function. The linking of these external devices and systems creates the pathway for information between the committed associate (i.e., user **106-1**), the external system(s) **328**, and the customer. The automation software component may act as an API to form a bi-directional computer connection between the external system(s) **328** and the computer system **120**/BOPIS application **201-11** of the observation platform. Information exchanged between the computer system **120**/BOPIS application **201-11** and the external retailer system **328** includes triggers for each process procedure, feedback from users, feedback from the observation platform regarding task progress or completion, and information from the external systems in the form of text, triggers, or audible information.

(161) At **730** of FIG. **7**A, in one embodiment, a message regarding a BOPIS order populated in the external system **328** is received, at the BOPIS application **201-11** from the external retailer system **328**. Messages passed between the external systems **328** and the computer system **120**/BOPIS application **201-11** of the observation platform provide an indication of the BOPIS order status and any actions requested (e.g., task requests) of the connected associates (e.g., the selected users **106**).

(162) At **740** of FIG. **7**A, in one embodiment, a task request is sent by the observation platform to a device of a user of the observation platform. The task request is a request to perform a task related to the message regarding the BOPIS order. The observation platform interprets information from the external retailer system(s) **328** and sends an action request/task request to one or more of the set of connected associates who were identified by the observation platform to perform specific tasks. In one example, a pick order is sent from the external retailer system **328** to the BOPIS application **201-11** of the observation platform and, in response, the observation platform determines sends a task request for picking item(s) of the order to one or more of the set of connected associates used to perform the pick function. In another case, the observation platform may receive an indication that a customer has arrived, or is soon to arrive, and that the order should be prepared for delivery. In that case, the observation platform sends a task request to one or more of the of the connected associates for delivery of a complete order to the customer.

(163) Once the task request goes out to one or more of the set of connected associates, a response by the first associate to “accept” the task request indicates a commitment for follow through on the actions communicated in the task request. The task associated with the task request is then considered “accepted.” For example, the system may announce that “a customer will arrive in two minutes” to the set of associates designated to fulfill order delivery. The first user in that set who responds with a “taking” action such as, “I've got it” or “Copy that” becomes the committed associate for that order. All further instructions, action requests, and responses for that order are no longer heard by full set of connected associates but are now exclusively heard by the committed associate only.

(164) With reference to FIG. **7**B, at **750**, in one embodiment, a task acceptance message is received at the operating platform from the device to indicate acceptance of the task by the user. The user initiates the task acceptance message via interaction with the device, such as by pressing a button and speaking into the device or a microphone coupled with the device or by inputting text into the device.

(165) At **760** of FIG. **7**B, in one embodiment, in response to receipt of the task acceptance message, the observation platform suspends other task requests from being sent to the device of the user until a task completion message is received from the device to indicate completion of the task by the user. For example, a connected associate committed to a task request for picking item(s) in an order may be temporarily removed from the set of connected associates, so that they may concentrate on delivery and service without being interrupted by subsequent task requests or communications not related to the task request. Once the task is completed (e.g., reported as complete via device **105** or recognized as complete via other means), the removed connected associate automatically is restored into the set of connected associates so they may choose to respond to a subsequent task

request.
(166) At **770** of FIG. **7**B, in one embodiment, the observation platform receives a task completion message from the device to indicate completion of the task by the user. The user initiates the task completion message via interaction with the device, such as by pressing a button and speaking into the device or a microphone coupled with the device or by inputting text into the device.
(167) At **780** of FIG. **7**B, in one embodiment, the BOPIS application of the observation platform reports, to the external retailer system **328**, the completion of the task related to the BOPIS message.
(168) As an example, and with reference to procedures **730**-**780**, in one embodiment, an order may need to be picked from the store inventory and a message regarding the need for picking of the BOPIS order is received at BOPIS application **201**-**11** from external retailer system **328**. In response, BOPIS application **201**-**1** sends a connected associate a task request (via the observation platform). The task request is a request for the connected associate to assist with picking the ordered items from store inventory and/or store shelves. Upon acceptance of the task request, the connected associate would be provided (on their device **105**) with instructions for accessing the pick list, instructions for picking one or more items, or may receive the details of the pick list through the observation platform. As the items on the pick list are assembled, the connected associate may use an alternate application to indicate the item is picked and packaged or may use the observation platform directly to indicate the identification of each item (e.g., by voice or text interaction with their device **105**) and whether or not that item is picked and packaged with the order. In some embodiments, the connected associate may be pointed to a separate application for picking and collecting the items on the order. In this example, the connected associate may report the order picking is complete to the observation platform (e.g., by voice or text interaction with their device **105**) which then forwards the status to the external system **328** or may indicate completeness in the separate application that reports to the external computer system(s) **328**. In some embodiments, the observation platform may block or suspend other task requests from being sent to the connected associate until a task completion message is received from the connected associate (via their device **105**) to indicate that the task has been completed (i.e., the order has been picked or the assigned items in the order have been picked). Upon receipt of the task completion message, the BOPIS application **201**-**11** may report completion of the task to the external retailer system **328** (e.g., that the BOPIS order has been picked/assembled and is ready for delivery to the customer).
(169) With continued reference to **730**-**780**, in another embodiment, a fully picked/assembled order may need to be picked up from retail store by a customer and a message regarding the need for pickup of the BOPIS order is received at BOPIS application **201**-**11** from external retailer system **328**. In response, BOPIS application **201**-**1** sends a connected associate a task request (via the observation platform). The task request is a request for the connected associate to assist with delivering the ordered items to the customer. Upon acceptance of the task request, the connected associate would be provided (on their device **105**) with instructions for making contact with the customer to deliver the items of the BOPIS order. The information provided to the connected associate may additionally or alternatively include such information as: the order number, the customer's name, an estimated time of arrival (ETA) of the customer, how to identify the customer, the expected location of the customer (e.g., a delivery stall or location within the retailer's premises), and other information relevant to the order or its delivery. The observation platform may block or suspend other task requests from being sent to the connected associate until a task completion message is received from the connected associate (via their device **105**) to indicate that the task has been completed (i.e., the order has been provided to the customer). Upon receipt of the task completion message, the BOPIS application **201**-**11** may report completion of the task to the external retailer system **328** (e.g., that the BOPIS order has been provided to the customer).
(170) As can be seen from the descriptions and examples above, integrating the observation

platform with the store computer running the BOPIS process allows the store to make near-real-time decisions regarding how the associates are assigned to tasks. Having the flexibility to adjust task priority quickly and with low effort improves customer satisfaction and reduces operational costs.

(171) With reference to FIG. **7**C, at **790**, in one embodiment, the observation platform gathers data and primary statistics associated with the user and the task which was assigned to and accepted by the user. As with other applications deployed on the observation platform, data and primary statistics are collected from each portion of the activity described in FIGS. **7**A and **7**B. The data and primary statistics may include such information as: timestamps for start, end, and each portion of the process (e.g., when a task was offered, accepted, assigned, and/or reported as complete); user identities; device identities; location and motions for devices used; voice communication recording for analysis or forensics; text communication recording for analysis or forensics; system performance indicators such as speech quality, speech recognition effectiveness, signal strengths, ambient noise assessments, etc.

(172) Depending on the sophistication and complexity of the external retailer system(s) **328** events such as status updates, progress reports, milestone markers, and task completion indications are signaled back to the external system either in real-time or post completion of a BOPIS order's picking and/or delivery to a customer. There is also an opportunity to survey the customer and/or the associate regarding the process and satisfaction once the task is shown as complete. The survey can use feedback entered directly into the observation platform system verbally (e.g., via a device **105**) or via a feedback mechanism in user interface of the external retailer system **328**.

(173) Data Collection, Categorization and Generation of User Performance Metrics from Applications

(174) The observation platform collects data and primary statistics for all users and devices connected through the system or connected to the system. Examples of such data and primary statistics are shown in Table 1 and Table 2. Aggregation and manipulation of the primary statistics into secondary statistics and potentially into Higher-order statistics results in many categories of statistics that indicate the performance of an employee while in the environment of the observation platform.

(175) Two broad categories of data are collected within the observation platform environment: objective data, and subjective data. Algorithms within the computer system attached to the observation platform then combine the data using policy and weighting factors provided by the enterprise or the defaulted to the observation platform system. The output of the algorithm becomes a component of the employee score that is either explicitly displayed or used internally for the computation of a Higher-order statistic that indicates a component of the employee performance score that is explicitly displayed.

(176) In one embodiment, objective and subjective data may be combined to yield a performance score. For example, a manager may highly value time-in-zone, an objective primary statistic, with a weighting factor that is important to his business. The weighting factor is a subjective data element that is combined by the algorithm and policy within the observation platform which yields a performance score element for the user.

(177) As one case, performance metrics can use location information as one Primary Statistic combined with other contextual information to produce secondary and higher-order statistics indicating the personal productivity metrics for the user.

(178) In one embodiment, quantifying the percent of time a device or user spends in an assigned zone, the motion within that zone, the movement speed within the zone, the comparison of motion in the zone to outside of the zone or with other specified zones are combined to indicate performance factors such as energy, attentiveness and urgency. By measuring the relative time spent in other zones, the algorithm can determine the degree of task focus and attention to visitors or shoppers. By measuring the user communication patterns within and outside of the zone of

interest, the algorithm can determine such performance factors as focus, helpfulness, inquisitiveness, depth of knowledge for the zone contents or function, and the willingness to follow instructions.

(179) In one embodiment, counting the number of times a user (User A) requests the location of another user (User B) as a primary statistic, can be used to determine secondary or higher-order statistics that score how much a person is relied on in the enterprise and how often people want to find them (User B) or how well a manager is keeping up with situational awareness by checking the locations of employees (User A).

(180) In one embodiment, counting the number of times a user (User A) requests "Who is near" a specific location to hear a list of employees and their status within that location, results in a primary statistic that can be used to determine secondary or higher-order statistics that score how much attention that user (User A) is paying to the situational awareness of the store or enterprise.

(181) In one embodiment, combining verbal question-and-answer functions, with location data can be used by the algorithm to determine performance factors such as: product knowledge, team commitment, inquisitiveness, aptitude for products or functions within the zone, and team helpfulness.

(182) The request and response function (which may be handled by request and response application **201**-**2**) includes all cases where the system requests a response from a user, group of users or external devices; and then a response is expected and identified from one or more users or devices. The statistics can then be analyzed by the system to adjust the policy for the set of destinations alerted to subsequent requests for responses or to set expectations for the originator of the request on a subsequent action.

(183) In one embodiment, performance metrics can be derived from request and response data as one primary statistic combined with other contextual information to produce secondary and higher-order statistics indicating the personal productivity metrics for the user.

(184) In one embodiment, using and measuring request-and-response functions, with or without location data, as a primary statistic can be used to derive secondary and higher-order statistics that determine performance factors such as: response speeds, personal urgency, urgency to support others, team commitment, and personal energy levels. By comparing the request-and-response behaviors day-to-day, trends can be uncovered indicating employee motivation and employee reliability on a long-term or a daily basis.

(185) In one embodiment, using and measuring request-and-response functions for expert groups, with or without location data, as a primary statistic can be used to derive secondary and higher-order statistics that determine if new employees are curious about products, services or processes and if existing employees are willing to share knowledge and their depth of knowledge by subject. The algorithm thus determines performance factors such as: employee inquisitiveness, depth of subject knowledge, willingness to share knowledge and speed of integration into the enterprise.

(186) TABLE-US-00003 TABLE 3 Request and Response Examples Secondary and Higher- order Statistics (Performance Primary Function Primary Statistics Measurements) Expert Group - Count of questions asked by Inquisitiveness, assimilation Asking Questions user, times, locations where status and rate, knowledge about Processes asked, locations where topics, depth of process answered, time to answer, knowledge, willingness to length of answer, number of share knowledge, users listening to answer, consistency of actions number of users NOT listening to answer, keywords in question, keywords in answer, number of questions not listened to, requests heard and NOT responded to. Expert Group -- Count of questions asked by Inquisitiveness, assimilation Asking Questions user, times, locations where status and rate, knowledge about Products asked, locations where topics, depth of product answered, time to answer, knowledge, willingness to length of answer, number of share knowledge, users listening to answer, consistency of actions number of users NOT listening to answer, keywords in question, keywords in answer, number of questions not listened to, requests heard and NOT responded to. Zone-coverage alerts - Measure

reaction time to Team support, customer Receiving alerts respond to the request, number affinity, understanding of that a zone is not of requests responded to, time role, job urgency, staffed or is to arrive at the coverage environmental awareness. overstaffed location, locations where time spent, speed traveled, path traversed, requests heard and NOT responded to. Kiosk alerts - Measure reaction time to Urgency to support shoppers Receiving alerts that respond to the request, time to or visitors, helpfulness, depth a visitor is engaged arrive at the correct location, of knowledge regarding kiosk with a kiosk and may speed traveled, path traversed, products or information need attention speed to arrive in proximity of presented, awareness of visitor or shopper, length of priorities, customer time spent in location or in the satisfaction scores. proximity of the visitor, visitor feedback from external devices or systems used by visitors or customers, customer feedback rating from another user of the system, requests heard and NOT responded to, relationship of user role to the kiosk function. “Soft button” alerts - Measure reaction time to Urgency to support shoppers receiving alerts that a respond to the request, time to or visitors, helpfulness, depth visitor has pressed a arrive at the correct location, of knowledge regarding button or has verbally speed traveled, path traversed, button location products, requested help or speed to arrive in proximity of awareness of priorities, information and they visitor or shopper, length of customer satisfaction scores are expecting some time spent in location or in the action proximity of the visitor, visitor feedback from external devices or systems used by visitors or customers, customer feedback rating from another user of the system, requests heard and NOT responded to, relationship of user role to the kiosk function. Buy-on-line, fulfill-in- Measure reaction time to Urgency in inventory store requests - respond to the request, current verification, inventory alerts or task task, time to arrive at the location knowledge, desire to requests from omni- inventory location, speed assist, team cooperation, channel sources that traveled, path traversed, speed task switching speed, and inventory needs to be to verify inventory, speed to process support verified or held move inventory to holding location, voice inflections Pick-up requests - Measure reaction time to Urgency to support shoppers requests for products respond to the request, current or visitors, helpfulness, to be delivered to task, time to arrive at the desire to assist, customer specific locations inventory location, speed satisfaction scores. traveled, path traversed, speed to verify inventory, locations visited, voice inflections, visitor feedback from external devices or systems used by visitors or customers Inventory verification Measure reaction time to Urgency in inventory requests - requests respond to the request, time to verification, inventory from systems or arrive at the inventory location, location knowledge, desire to other stores to speed traveled, path traversed, assist, team cooperation and validate inventory speed to verify inventory, support status locations visited, voice inflections, speech cadence Responding to Measure times through zone Task orientation, willingness location-based tasks - with and without action, speed to take on new tasks, task tasks that are through zone, adjacency to efficiency, quality of heard when a user visitors or shoppers while workmanship, affinity to moves into a specific passing through zone, time to types of tasks zone close task after entering zone, voice inflections, speech cadence, subject feedback on quality and completeness of task within zone, task requests heard and NOT responded to.

(187) In one embodiment, combining point of sale (POS) information, with location data can be used by the algorithm to determine performance factors such as: selling effectiveness within assigned zone, selling effectiveness in other zones, attention to basket size, conversion rate scores, attention to product margins.

(188) In one embodiment, combining shopper or visitor feedback information gathered by shopper or visitor applications that are able to detect the observation platform user, with location data can be used by the algorithm to determine performance factors such as: customer satisfaction scores by zone covered, customer satisfaction vs. time spent with the customer, and other performance metrics as derived from survey tool applications used by the shopper or visitor

(189) In a different case, performance metrics can use external system instructions as one or more primary statistic(s) combined with other contextual information to produce secondary and higher-

order statistics indicating the personal productivity metrics for the user.
(190) In one embodiment, combining shopper or visitor encounter information gathered by detecting shopper or visitor applications using BLE, Bluetooth, Cellular or WiFi signal detection, with external system instructions can be used by the algorithm to determine performance factors such as: social interaction scores, helpfulness scores, shopper or visitor attentiveness scores, and urgency to assist scores.
(191) In one embodiment, combining task requests originating from external system instructions with other context information can be used by the algorithm to determine performance factors such as: reaction time to pick up assigned or requested tasks, reaction time to verify on-shelf or backroom inventory, task compliance performance, task urgency compliance, and competitiveness scores.
(192) In one embodiment, combining time-clock information from external systems with user behavior within the observation platform environment can be used by the algorithm to determine performance factors such as: ability to plan actions, ability to complete tasks in a timely manner, ability to complete tasks within daily deadlines, and ability to keep to schedules.
(193) In one embodiment, combining video camera information from external systems with user behavior within the observation platform environment can be used by the algorithm to determine performance factors such as: ability to address customers or visitors appropriately, ability to recognize poor coverage zones or assist groups of customers or visitors, urgency to address loss prevention alerts, ability to assist and support diverse cultures of customers or visitors.
(194) In a different set of cases, performance metrics can use information manually entered into either the observation platform or an external system as one Primary Statistic combined with other contextual information to produce Secondary and Higher-order statistics indicating the personal productivity metrics for the user. Manual entry can be via a smart device, tablet, computer screen, pushbutton, touch screen, or verbally using speech recognition.
(195) In one embodiment, combining external, manually entered information with user behavior and context within the observation platform environment can be used by the algorithm to determine performance factors such as: absorption and application of course work completed, absorption and application of video, audio or other training methodologies, absorption and application of brand-oriented messages and information provided by the enterprise, and correlation of course grades to the application of the material in the observation environment.
(196) In one embodiment, combining external, manually entered information from customers or visitors that is requested via an application running on a device carried by the customer or visitor, with user behavior and context within the observation platform environment can be used by the algorithm to determine performance factors such as: customer satisfaction scores, ability to pay attention and focus, ability to answer questions, demeanor, helpfulness, alertness, depth of knowledge, and breadth of knowledge.
(197) In one embodiment, combining external, manually entered information from other users of the system or peers, which is requested via an application running on a device carried by the user or from a terminal connected to the observation platform, with user behavior and user context within the observation platform environment can be used by the algorithm to determine performance factors such as: team player scores, helpfulness scores, knowledge sharing scores, customer satisfaction scores, demeanor toward co-workers, alertness, depth of knowledge, and breadth of knowledge.
(198) In one embodiment, combining external, manually entered information from other users of the system or peers, which is requested via a scheduled process or adjusted by enterprise policy controlling the scheduled process within the observation platform, with user behavior and user context within the observation platform environment can be used by the algorithm to determine performance factors such as: progress toward goals, team player scores, helpfulness scores, knowledge sharing scores, customer satisfaction scores, demeanor toward co-workers, alertness,

depth of knowledge, and breadth of knowledge.
(199) In one embodiment, combining external, manually entered information from the primary user with that same user's behavioral data and context within the observation platform environment can be used by the algorithm to determine performance factors such as: progress toward goals, new potential goals, attitude towards tasks, goals, career, and company; team player scores; demeanor toward co-workers or managers; desire for improvement; and willingness to accept feedback. Additionally, users can offer commentary, explanations, or rebuttals to the objective performance scores in the system.
(200) In one embodiment, combining external, manually and automatically entered information regarding length of employment and past roles and responsibilities can be used by the algorithm to determine performance factors such as: progress toward goals, new potential goals, attitude towards tasks, goals, career and company; team player scores; demeanor toward co-workers or managers; desire for improvement; willingness to accept feedback; and other career determining or limiting factors.
(201) In one embodiment, combining information from point-of-sale (POS) systems with the primary and secondary statistics of the user, especially proximity information gathered by beacons or BLE connections, can be used by the algorithm to determine performance factors such as: sales effectivity/efficiency (e.g., sales dollars per minute spent with shoppers), ability to upsell and influence add-on purchases, ability to move the shopper to different departments and increase basket size, ability to create conversions (sales) with shorter customer encounters.
(202) Example algorithms for producing quantified performance measurements and metrics are shown in Table 4. These algorithms represent one of many possible calculations for each performance metric. The algorithm examples use the coefficient “C” as a normalizing and weighting factor for each performance category. The other capital letter coefficients are used within the algorithm to weight each performance factor. All of these coefficients many be adjusted based on the business requirements of each environment.
(203) TABLE-US-00004 TABLE A Example Algorithms for Producing Quantified Performance Measurements and Metrics Primary Function Typical Algorithm Shown as an Example Result Expert Inquisitiveness: C[+M(number of questions A numerical value Group - asked/user-hr) + N(number of questions listened normalized in the Asking to/user-hr) + P(time spent listening to range of typically 0- Questions answers/user-hr) − Q(number of questions NOT 100 (by the constant about listened to/user-hr)] value of C) Processes Assimilation Status: C′[+M(number of indicating the [Process questions asked/user-hr) + N(number of performance of the questions questions listened to/user-hr) + A(the number of user for the are identified questions answered/user-hr) − T(average category. by either a response time to answer a question) − Q(number For “Knowledge specific of questions NOT answered/user-hr)] Topics” the result is command or Assimilation Rate: (the linear slope of the list of keyword a recognized above equation computed over an interval of topics in ranked set of time) order of frequency keywords] Depth of Process Knowledge: C″[−M(number of responding. of questions asked/user-hr) + A(the number of questions answered/user-hr) + W(the number of users who listen to the full answer) − X(the number of users who do NOT listen to full answer) − T(average response time to answer a question) − Q(number of questions NOT answered/user-hr)] Willingness to Share Knowledge: C‴ [+A(the percentage of questions answered) − T(average response time to answer a question) − Q(number of questions NOT answered/user-hr)] Consistency of Actions: Consistency is computed as the standard deviation (or other statistical model) for the set of characteristics defined above. Knowledge Topics: [keyword]*C‴[M(number of questions asked/user-hr) + N(number of questions listened to/user-hr) + A(the number of questions answered/user-hr) − T(average response time to answer a question) − Q(number of questions NOT answered/user-hr)] Expert Inquisitiveness: C[+M(number of questions A numerical value Group -- asked/user-hr) + N(number of questions listened normalized in the Asking to/user-hr) + P(time spent listening to range of

typically 0- Questions answers/user-hr) − Q(number of questions NOT 100 (by the constant about listened to/user-hr)] value of C) Products Assimilation Status: C′[+M(number of indicating the Product questions asked/user-hr) + N(number of performance of the questions questions listened to/user-hr) + A(the number of user for the are identified questions answered/user-hr) − T(average category. by either a response time to answer a question) − Q(number For “Knowledge specific of questions NOT answered/user-hr)] Topics” the result is command or Assimilation Rate: (the linear slope of the list of keyword a recognized above equation computed over an interval of topics in ranked set of time) order of frequency keywords] Depth of Process Knowledge: C″[−M(number of responding. of questions asked/user-hr) + N(number of questions listened to/user-hr) + A(the number of questions answered/user-hr) + W(the number of users who listen to the full answer) − X(the number of users who do NOT listen to full answer) − T(average response time to answer a question) − Q(number of questions NOT answered/user-hr)] Willingness to Share Knowledge: C‴ [+A(the percentage of questions answered) − T(average response time to answer a question) − Q(number of questions NOT answered/user-hr)] Consistency of Actions: Consistency is computed as the standard deviation (or other statistical model) for the set of characteristics defined above. Knowledge Topics: [keyword]*C‴[M(number of questions asked/user-hr) + N(number of questions listened to/user-hr) + A(the number of questions answered/user-hr) − T(average response time to answer a question) − Q(number of questions NOT answered/user-hr)] Zone- Team Support: C[T(average proximity to other A numerical value coverage users) + R(reaction time to respond to a normalized in the alerts - request) − S(average time to arrive at the range of typically 0- Receiving coverage location) + L(speed 100 (by the constant alerts that a traveled) + N(number of requests responded value of C) zone is not to/user-hr) − Q(number of requests NOT indicating the staffed or is responded to/user-hr)] performance of the overstaffed Customer Affinity: C′ [+R(reaction time to user for the respond to a request) − S(average time to arrive category. at the coverage location) + L(speed traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to/user-hr)] Understanding of Role: C″[A(time spent in target location) + R(reaction time to respond to a request) − S(average time to arrive at the coverage location) + L(speed traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to/user-hr)] Job Urgency: C‴[A(time spent in target location) + R(reaction time to respond to a request) − S(average time to arrive at the coverage location) + L(speed traveled)] Environmental Awareness: C⁗[A(time spent in target location) + B(number of other locations visited/user-hr) − C(number of locations not visited/user-hr) − P(the path length traveled vs. the average path length for all users between the starting point and the ending point)] Kiosk alerts - Urgency to Support Visitors: C[+R(reaction A numerical value Receiving time to respond to a kiosk request) − S(average normalized in the alerts that a time to arrive at the coverage range of typically 0- visitor is location) + L(speed traveled) + N(number of 100 (by the constant engaged requests responded to/user-hr) − Q(number of value of C) with a kiosk requests NOT responded to/user-hr)] indicating the and may Helpfulness: C′[+R(reaction time to respond performance of the need to a kiosk request) − S(average time to arrive at user for the attention the coverage location) + L(speed category. traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to)] + T(time spent at the kiosk location) + V(time spent in the proximity of the visitor)] Depth of Knowledge Regarding Kiosk Products: C″[+R(reaction time to respond to a kiosk request) + A(the number of questions with relevant keywords answered/user-hr) + W(the number of users who listen to the full answer) − X(the number of users who do NOT listen to full answer) − T(average response time to answer a question with relevant keywords) − Q(number of questions NOT answered/user-hr) with relevant keywords] Awareness of Priorities: C‴[+R(reaction time to respond to a kiosk request) − S(average time to arrive at the coverage location) + L(speed traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to)] + E(relationship of role to kiosk function)] Customer Satisfaction Scores: C⁗[+R(reaction time to respond to a kiosk request) − S(average time to arrive at the coverage location) + L(speed

traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to)] + F(customer feedback scores collected from kiosk or applications related to kiosk) + G(customer feedback rating from another user of the system)] “Soft button” Urgency to Support Visitors: C[+R(reaction A numerical value alerts - time to respond to a kiosk request) − S(average normalized in the receiving time to arrive at the coverage range of typically 0- alerts that a location) + L(speed traveled) + N(number of 100 (by the constant visitor has requests responded to/user-hr) − Q(number of value of C) pressed a requests NOT responded to/user-hr)] indicating the button and Helpfulness: C′[+R(reaction time to respond performance of the expecting to a kiosk request) − S(average time to arrive at user for the some action the coverage location) + L(speed category. traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to/user-hr)] + T(time spent in the proximity of the soft button location) + V(time spent in the proximity of the visitor)] Depth of Knowledge Regarding Kiosk Products: C″[+R(reaction time to respond to a soft button request) + A(the number of questions with relevant keywords answered/user-hr) + W(the number of users who listen to the full answer) − X(the number of users who do NOT listen to full answer) − T(average response time to answer a question with relevant keywords) − Q(number of questions NOT answered/user-hr) with relevant keywords] Awareness of Priorities: C‴[+R(reaction time to respond to a kiosk request) − S(average time to arrive at the coverage location) + L(speed traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to)] + E(relationship of role to soft button request type)] Customer Satisfaction Scores: C⁗[+R(reaction time to respond to a kiosk request) − S(average time to arrive within proximity of the soft button) + L(speed traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to)] + F(customer feedback scores collected from soft button or applications related to soft button) + G(customer feedback rating from another user of the system)] + V(positive voice inflection scores for communications over the past T user-hrs) Buy-on-line, Urgency in Inventory Verification: A numerical value pick-up-in- C[+R(reaction time to respond to a BOPIS normalized in the store request)-S(average time to arrive at the range of typically 0- (BOPIS) inventory location) + L(speed 100 (by the constant requests - traveled) + N(number of BOPIS requests value of C) alerts or task responded to/user-hr) − Q(number of BOPIS indicating the requests requests NOT responded to/user-hr)] performance of the from omni- Inventory Location Knowledge: user for the channel C′[+R(reaction time to respond to a BOPIS category. sources that request)-S(average time to arrive at the inventory inventory location) + L(speed traveled) − P(the needs to be path length traveled vs. the average path verified or length for all users between the starting point held and the ending point)] Desire to Assist: C″[+R(reaction time to respond to a BOPIS request) − S(average time to arrive at the product location) + L(speed traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to/user-hr)] + E(relationship of role to BOPIS request type)] Team Cooperation: C‴[+R(reaction time to respond to a BOPIS request) − S(average time to arrive at the product location) + L(speed traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to/user-hr)] + V(positive voice inflection scores for communications over the past T user-hrs) Pick-up or Urgency to Support Visitors: C[+R(reaction A numerical value Carry Out time to respond to a request) − S(average time normalized in the alerts - task to arrive at the required location) + L(speed range of typically 0- requests for traveled) + N(number of requests responded 100 (by the constant products to to/user-hr) − Q(number of requests NOT value of C) be delivered responded to/user-hr)] indicating the to specific Helpfulness: C′[+R(reaction time to respond performance of the locations to a request) − S(average time to arrive at the user for the required location) + L(speed category. traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to/user-hr)] + T(time spent from arriving at the required location to indicating the task is complete) + V(time spent in the proximity of the visitor)] Desire to Assist: C″[+R(reaction time to respond to a request) − S(average time to arrive at the required location) + L(speed traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to/user-hr)] +

E(relationship of role to Pick-up or Carry Out request type)] Customer Satisfaction Scores: C‴ [+R(reaction time to respond to a request) − S(average time to arrive within proximity of the request) + L(speed traveled) + N(number of requests responded to/user-hr) − Q(number of requests NOT responded to/user- hr)] + F(customer feedback scores collected from an application running in a visitor device) + G(customer feedback rating from another user of the system)] + V(positive voice inflection scores for communications over the past T user-hrs) Inventory Urgency in Inventory Verification: A numerical value verification C[+R(reaction time to respond to a verification normalized in the requests - request) − S(average time to arrive at the range of 0-100 (by task inventory location) + L(speed the constant value requests traveled) + N(number of verification requests of C) indicating the from responded to/user-hr) − Q(number of verification performance of the systems or requests NOT responded to/user-hr)] user for the other stores Inventory Location Knowledge: category. to validate C′[+R(reaction time to respond to a verification inventory request) − S(average time to arrive at the status inventory location) + L(speed traveled) − P(the path length traveled vs. the average path length for all users between the starting point and the ending point)] Desire to Assist: C″[+R(reaction time to respond to a verification request) − S(average time to arrive at the required location) + L(speed traveled) + N(number of verification requests responded to/user-hr) − Q(number of verification requests NOT responded to/user- hr)] + E(relationship of role to inventory verification request type)] Team Cooperation: C‴[+R(reaction time to respond to an inventory verification request) − S(average time to arrive at the product location) + L(speed traveled) + N(number of inventory verification requests responded to/user-hr) − Q(number of inventory verification request NOT responded to/user-hr)] + V(positive voice inflection scores for communications over the past T user-hrs) Responding Task Orientation: C[+D((number of location- A numerical value to location tasks accepted/user-hr)/(number of location- normalized in the based tasks - tasks heard/user-hr)) − T(time to indicate task range of typically 0- task completion)] I 00 (by the constant requests that Willingness to Take on New Tasks: value of C) are heard C′[+D((number of location-tasks indicating the when a user accepted/user-hr)/(number of location-tasks performance of the moves into a heard/user-hr)) + N(number of different locations user for the specific zone for accepted tasks) − M(number of different category. locations for tasks NOT accepted) For “Affinity to Task Efficiency: C″[+D((number of location- Types of Tasks” the tasks accepted/user-hr)/(number of location- result is list of task tasks heard/user-hr)) − H(time from task locations in ranked acceptance to task complete)] order of frequency Quality of Workmanship: C″[+D((number of of acceptance in a location-tasks accepted/user-hr) − H(time from given location. task acceptance to task complete) + B(external rating of workmanship from other users or managers)] Affinity to Types of Tasks: C‴[+D((number of location-tasks accepted/user-hr for each location)]

Example Computer System Environment for the Observation Platform

(204) Portions of the present technology are composed of computer-readable and computer-executable instructions that reside, for example, in computer-usable/readable media of a computer system or other user device. Described below is an example computer system or components that may be used for or in conjunction with aspects of the present technology. The computer system described by represent one or more components of a computer system **120** of an environment **100** of an observation platform, or some other computer used with the technology described herein.

(205) It is appreciated that that the present technology can operate on or within a number of different computer systems including general purpose networked computer systems, embedded computer systems, cloud-based computers, routers, switches, server devices, user devices, various intermediate devices/artifacts, stand-alone computer systems, mobile phones, personal data assistants, televisions and the like. The computer system is well adapted to having peripheral computer useable/readable media such as, for example, a floppy disk, a compact disc, and the like coupled thereto.

(206) The computer system includes an address/data bus for communicating information, and a

processor coupled to bus for processing information and instructions. The computer system is also well suited to a multi-processor or single processor environment and also includes data storage features such as a computer usable volatile memory, e.g., random access memory (RAM), coupled to bus for storing information and instructions for processor(s).
(207) The computer system may also include computer usable non-volatile memory, e.g., read only memory (ROM), as well as input devices such as an alpha-numeric input device, a mouse, or other commonly used input devices. The computer system may also include a display such as liquid crystal device, cathode ray tube, plasma display, and other output components such as a printer or other common output devices.
(208) The computer system may also include one or more signal generating and receiving device(s) coupled with a bus for enabling the system to interface with other electronic devices and computer systems. Signal generating and receiving device(s) of the present embodiment may include wired serial adaptors, modems, and network adaptors, wireless modems, and wireless network adaptors, and other such communication technology. The signal generating and receiving device(s) may work in conjunction with one or more communication interface(s) for coupling information to and/or from the computer system. A communication interface may include a serial port, parallel port, Universal Serial Bus (USB), Ethernet port, antenna, or other input/output interface. A communication interface may physically, electrically, optically, or wirelessly (e.g., via radio frequency) couple the computer system with another device, such as a cellular telephone, radio, a handheld device, a smartphone, or computer system.
(209) Although the subject matter is described in a language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms of implementing the claims.

Claims

1. A method of managing emergency management information within an observation platform, the method comprising: provisioning, at an observation platform, an emergency management and response application, wherein the provisioning is administered by a cloud services platform and includes configuration and deployment of the emergency management and response application within the observation platform; responsive to receipt at the observation platform of a report of an emergency, triggering operation of the emergency management and response application within the observation platform; and sending, via the emergency management and response application, emergency management information to a group of users of the observation platform.
2. The method as recited in claim 1, further comprising: escalating, by the observation platform, the emergency management information to a larger audience based on a type of the emergency.
3. The method as recited in claim 1, further comprising: tracking, by the emergency management and response application, responses of users of the group of users to the emergency management information; and determining, by the emergency management and response application, based on the user responses, a status of an overall emergency response in comparison to a default emergency response plan configured into the emergency management and response application as part of an enterprise policy on the observation platform.
4. The method as recited in claim 1, further comprising: gathering, from users of the group of users, data and primary statistics, wherein the data and primary statistics are selected from a group of data and primary statistics consisting of: a task name; a task status; a timestamp for when a task was offered; a timestamp for when a task was assigned; a timestamp for when a task was accepted; a timestamp for when a task was updated; a timestamp for when a task was completed; location information of one or more users of the group of users; and an interaction between users of the group of users.

5. The method as recited in claim 4, further comprising: analyzing, by the observation platform, the data and primary statistics; and sending, by the observation platform, the analyzed data and primary to one of management and other users for decision making purposes, supported in various locations.
6. The method as recited in claim 5, further comprising: based on results of the analysis and user actions, sending, via the emergency management and response application, supplemental emergency management information to at least one user of the group of users.
7. The method as recited in claim 5, further comprising: based on results of the analysis, adjusting, by the observation platform, enterprise policy controlling the emergency management and response application.
8. The method as recited in claim 1, further comprising: establishing a communicative connection between the emergency management and response application and a system external to the observation platform.
9. The method as recited in claim 8, further comprising: sending, to the external system, data and primary statistics gathered from users of the group of users, wherein the data and primary statistics are selected from a group of data and primary statistics consisting of: a task name; a task status; a timestamp for when a task was offered; a timestamp for when a task was assigned; a timestamp for when a task was accepted; a timestamp for when a task was updated; a timestamp for when a task was completed; location information of one or more users of the group of users; and an interaction between users of the group of users.
10. The method as recited in claim 9, further comprising: based on external system interactions, sending, via the emergency management and response application, additional emergency management information to at least one user of the group of users.
11. A non-transitory computer-usable storage medium having instructions embodied therein that, when executed, cause a computer system to perform a method of managing emergency management information within an observation platform, the method comprising: provisioning, at an observation platform, an emergency management and response application, wherein the provisioning is administered by a cloud services platform and includes configuration and deployment of the emergency management and response application within the observation platform; responsive to receipt at the observation platform of a report of an emergency, triggering operation of the emergency management and response application within the observation platform; and sending, via the emergency management and response application, emergency management information to a group of users of the observation platform.
12. An observation platform comprising: a computer system; a first communication device associated with a first user; a second communication device associated with and communicatively coupled with the computer system; and a plurality of additional communication devices, where each of the plurality of additional communication devices is associated with a different user of a plurality of additional users; and wherein the computer system is configured to communicate with the first communication device and the plurality of additional communication devices via the second communication device and is further configured to: provision, at the observation platform, an emergency management and response application, wherein the provisioning is administered by a cloud services platform in collaboration with the computer system and includes configuration and deployment of the emergency management and response application within the observation platform; responsive to receipt at the observation platform of a report of an emergency, trigger operation of the emergency management and response application within the observation platform; and send, via the emergency management and response application, emergency management information to a group of users of the observation platform, wherein the group of users is selected from the first user and the plurality of additional users.
13. The observation platform of claim 12, wherein the computer system is further configured to: escalate the emergency management information to a larger audience based on a type of the

emergency.
14. The observation platform of claim 12, wherein the computer system is further configured to: track responses of users of the group of users to the emergency management information; and determine, based on the user responses, a status of an overall emergency response in comparison to a default emergency response plan configured into the emergency management and response application as part of an enterprise policy on the observation platform.
15. The observation platform of claim 12, wherein the computer system is further configured to: gather, from users of the group of users, data and primary statistics, wherein the data and primary statistics are selected from a group of data and primary statistics consisting of: a task name; a task status; a timestamp for when a task was offered; a timestamp for when a task was offered assigned; a timestamp for when a task was accepted; a timestamp for when a task was updated; a timestamp for when a task was completed; location information of one or more users of the group of users; and an interaction between users of the group of users.
16. The observation platform of claim 12, wherein the computer system is further configured to: establish a communicative connection between the emergency management and response application and a system external to the observation platform.
17. The observation platform of claim 16, wherein the report of an emergency is received from one of the system external to the observation platform and the first user via the first communication device.
18. A system comprising: an observation platform remote from and communicatively coupled with a cloud services platform, the observation platform comprising: a computer system; a first communication device associated with a first user; a second communication device associated with and communicatively coupled with the computer system; and a plurality of additional communication devices, where each of the plurality of additional communication devices is associated with a different user of a plurality of additional users; and a cloud services platform comprising: a functional application suite which includes a plurality of remotely provisionable applications wherein an emergency management and response application is one of the plurality of remotely provisionable applications; and an external systems interface configured to couple the observation platform via the cloud services platform with one or more systems external to the observation platform; and wherein the cloud services platform is configured to provision, at the observation platform, the emergency management and response application, wherein the provisioning includes configuration and deployment of the emergency management and response application within the observation platform; and wherein the computer system is configured to communicate with the first communication device and the plurality of additional communication devices via the second communication device and is further configured to: responsive to receipt at the observation platform of a report of an emergency, trigger operation of the emergency management and response application within the observation platform; and send, via the emergency management and response application, emergency management information to a group of users of the observation platform, wherein the group of users is selected from the first user and the plurality of additional users.
19. The system of claim 18, wherein the computer system is further configured to: gather, from users of the group of users, data and primary statistics, wherein the data and primary statistics are selected from a group of data and primary statistics consisting of: a task name; a task status; a timestamp for when a task was offered; a timestamp for when a task was offered assigned; a timestamp for when a task was accepted; a timestamp for when a task was updated; a timestamp for when a task was completed; location information of one or more users of the group of users; and an interaction between users of the group of users.
20. The system of claim 18, wherein the computer system is further configured to: invoke, via the emergency management and response application, features of a personality application to change a sound of a system voice to a personality associated with urgent or emergency situations.