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## MUTE NOTIFICATIONS VIA WEARABLE COMPUTING DEVICE

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## **MUTE NOTIFICATIONS VIA WEARABLE COMPUTING DEVICE**

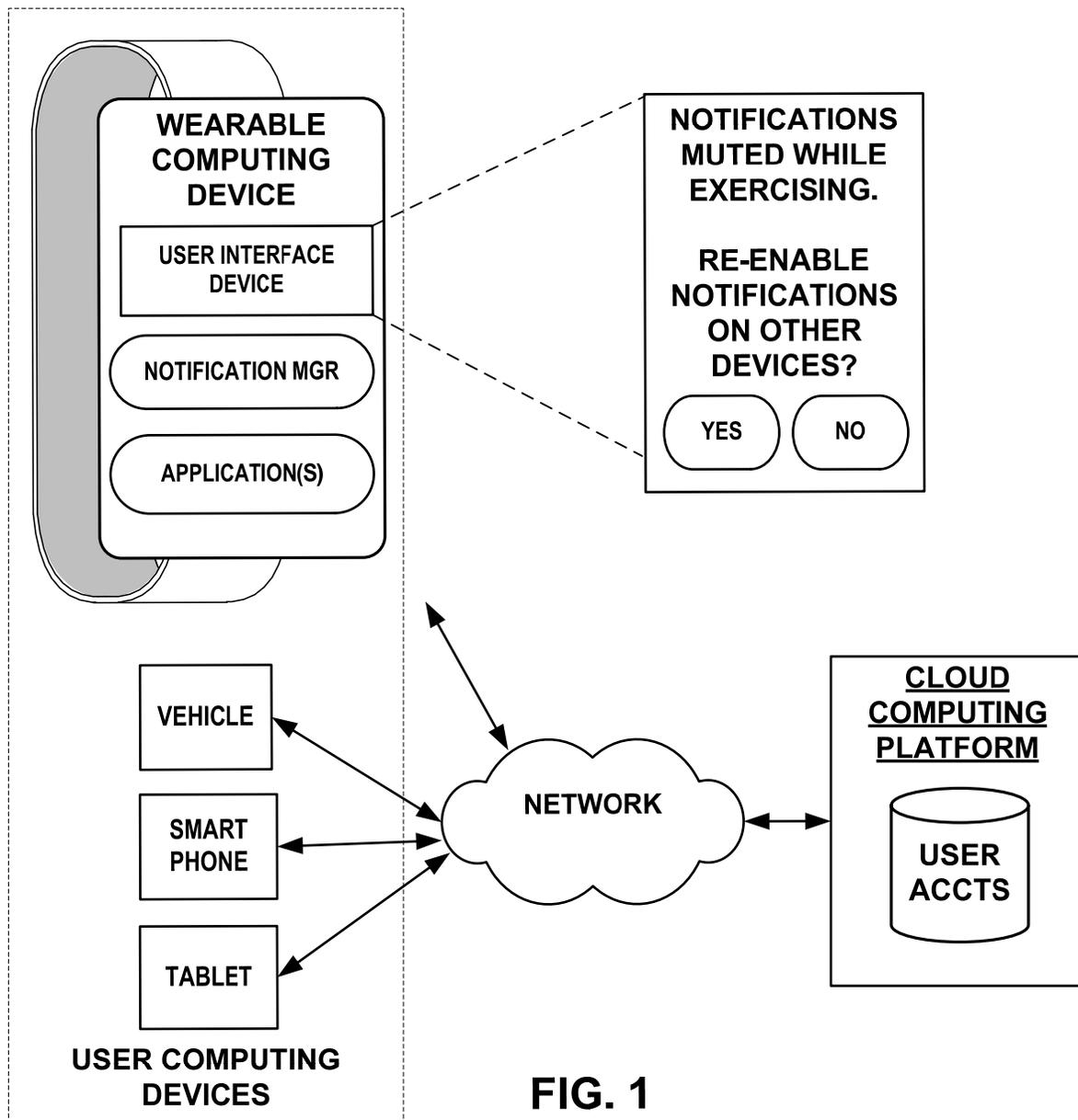
### **ABSTRACT**

Rather than requiring a user to mute notifications across multiple devices associated with the user, a user may be able to simply mute notifications on a wearable computing device, such as a watch, and the wearable computing device may automatically and without requiring additional user input, mute notifications on some or all of the user's other devices. That is, a wearable computing device may mute, silence, block, or otherwise limit notifications on computing devices that are associated with the same user as the wearable computing device. In some instances (e.g., an emergency situation), it may be important for another user to still reach the user even though the user has effectively turned off notifications across all of the user's devices. In such instances, the other user may send a specially configured message (e.g., including special characters, code word(s), or other information) or repeated messages to the user and the notification system will still notify the user despite notifications being disabled.

### **DESCRIPTION**

Modern computing devices, such as mobile phones, counter-top devices, automobiles, and many other types of computing devices, can be incredibly powerful tools but can also overwhelm a user with many different types of notifications and make it difficult for the user to disconnect from his or her device. A computing device may include a silent mode which may block notifications for that particular computing device. However, a user may utilize numerous computing devices, such that the user may need to enable to silent mode on each computing device to escape the constant bombardment of notifications, alerts, alarms, etc.

Rather than require a user to individually control numerous computing devices, a notification management service may control notifications for one or more computing devices that are each associated with the same user account. For example, a wearable computing device (e.g., a smart watch), a mobile computing device (e.g., a tablet, laptop, smart phone, etc.), a countertop computing device, a desktop, a television, a smart speaker, or any other type of computing device may each be associated with a user account. For example, a user may interact with one or more computing devices by entering the same login credentials (e.g., username and password) at the various computing devices to associate the computing devices with a user account for that user.

**FIG. 1**

The computing system of FIG. 1 includes a cloud computing platform and a plurality of user computing devices that are connected via a network. The network represents a combination of any one or more public or private communication networks, for instance, television broadcast networks, short-wavelength wireless networks, cable or satellite networks, cellular networks, Wi-Fi networks, broadband networks, and/or other type of network for transmitting data (e.g.,

telecommunications and/or media data) between various computing devices, systems, and other communications and media equipment.

In the example of FIG. 1, the user computing devices include a wearable computing device, vehicle, smartphone, and tablet. Other examples of user computing devices include countertop computing devices, home automation computing devices, laptop computers, desktop computers, televisions, stereos, automobiles or other vehicles (e.g., a so-called “infotainment system”), and all other type of mobile and non-mobile computing devices that are configured to execute one or more applications. While illustrated as a watch, wearable computing device may include any type of wearable computing device, such as computerized eyewear, computerized gloves, computerized clothing, etc.

The user computing devices may be associated with a single user. In some examples, the wearable computing device, smart TV, smartphone, and tablet may each be associated with the same user account. For example, a user may enter the same username and password on each of the user computing devices to access various features of the respective user computing devices. In some examples, the cloud computing platform includes user account data (e.g., in a database or other data structure) associating the user account with each of the user computing devices. For example, the cloud computing platform may include a device identifier for each device associated with the user account. In some examples, the wearable computing device may include data associated each user computing device with the user. For example, the wearable computing device may include a device identifier for each user computing device.

Each user computing devices may be configured to output notifications. For example, a smartphone may receive messages (e.g., text messages, emails, etc.) from the cloud computing platform or another computing devices and may output the notification via a user interface

device. In some examples, multiple user computing devices may receive the same message (e.g., email, text message, etc.) from the cloud computing platform and may each output a notification in response to receiving the message. For example, the cloud computing platform may output a message to multiple devices associated the same user account. As another example, applications executing at the user computing devices may output notifications. For example, a navigation application executing on the vehicle may output a notification indicating an upcoming turn, an accident, or other traffic or navigation related notification.

User computing devices may each include at least one user interface devices (UID). The UIDs may function as an input devices and output devices for the respective computing devices. The UID may function as an input device using a presence-sensitive input screen, such as a resistive touchscreen, a surface acoustic wave touchscreen, a capacitive touchscreen, a projective capacitance touchscreen, a pressure sensitive screen, an acoustic pulse recognition touchscreen, or another presence-sensitive display technology. In some examples, the UID may function as an input device using a microphone, mouse, remote control (sometimes referred to a “clicker”), or other input device. The UID may function as an output (e.g., display) device using any one or more display devices, such as a liquid crystal display (LCD), dot matrix display, light emitting diode (LED) display, organic light-emitting diode (OLED) display, e-ink, or similar monochrome or color display capable of outputting visible information to a user. In some examples, the UID may function as an output device using a speaker, haptic device, or other output device.

Each user computing device may include one or more applications configured to output one or more notifications. For example, the smartphone may include an email application, a text messaging application, and a navigation application. Each of the email, text messaging, and

navigation applications may output notifications for display by a UID of the smartphone. Similarly, the tablet, vehicle, and other user computing devices may also include applications configured to output notifications.

The wearable computing device includes a notification manager. The notification manager may enable the wearable computing device to control notifications for each of the user computing devices, such as temporarily restricting the user computing devices from outputting notifications. In some examples, the notification manager determines a notification policy and distributes the policy to each of the user computing devices. For example, the wearable computing may include data identifying user computing devices associated with the user and may output the notification policies to each of the user computing devices associated with the user. As another example, the wearable computing device may send the notification policies to the cloud computing platform, which may distribute the notification policies to the user computing devices associated with that user.

A notification policy may define whether a computing device may output a notification, or may define instances (e.g., days, times, locations, etc.) when the computing device may output notifications or is restricted from outputting notifications. Notification policies may be preprogrammed or set by a user of the user computing devices. In some examples, the wearable computing device may dynamically determine notification policies, for example, using machine learning. For example, the notification manager may learn scenarios when the user puts one or more user computing devices in a silent or do-not-disturb mode and may define a notification policy based on the learned scenarios.

In some examples, notification manager may define a global notification policy that defines whether, when, or where each of the user computing devices output notifications or

restrict notifications. In other words, the global notification policy may define a single set of rules permitting or restricting notifications on all of the user computing devices. In some examples, the notification manager may define custom notification policies for the various user computing device and/or applications executing at the user computing devices. For example, when a user of the wearable computing device is driving, the notification manager may restrict all notifications from all applications executing on the wearable computing device, smart phone, and tablet and may enable notifications from a navigation application executing on the vehicle infotainment system (e.g., and restricting notifications from other applications executing on the vehicle infotainment system).

Each notification policy includes a start condition. In other words, each notification policy defines a scenario (e.g., day, time, location, etc.) for when a user computing device is permitted to start outputting notifications or when a user computing device is restricted from outputting notifications. For example, the notification manager may include a notification policy restricting the smart phone from outputting text messages in response to detecting the smart phone has entered a vehicle. As another example, the notification manager may include a notification policy restricting the tablet from outputting an email notification in response to detecting the user is talking on the phone. As yet another example, the notification manager may include a notification policy restricting all notifications by all user computing devices when the wearable computing device detects the user is exercising or physically active (e.g., walking, jogging, biking, etc.).

In some examples, at least some notification policies include a termination condition. In other words, a notification policy may define a scenario (e.g., day, time, location, etc.) at which the policy is complete such that a user computing device may continue outputting notifications.

As one example, the termination condition may indicate when the user computing device may exit a silent or do-not-disturb mode. Example termination conditions may be based on time (e.g., a pre-defined amount of time has elapsed since the start condition, or a pre-defined time of day, such as 4pm) or location (e.g., arrival at a location or departure from the location). As another example, a termination condition may be based on completion of an event, such as completion of a workout or meeting a fitness goal, completion of a to-do list, etc.

A notification policy may include one or more exception conditions. The exception conditions may be pre-programmed, user defined, or derived via machine learning. In some examples, the exception condition may be based on a sender, quantity of message, importance of a message, etc. As one example, the exception conditions may identify one or more senders from whom the user computing devices are permitted to output notifications. For example, a user may adjust a notification policy to enable the smartphone to output notifications from user's spouse while blocking all other notifications. In some scenarios, the exception condition may indicate that the user computing devices are permitted to output important or urgent notifications. In some examples, the notification manager may determine that notifications are urgent based on a content of the message. For example, the notification manager may determine the message content includes special characters, one or more codewords or code-phrases, such as a subject line of an email that includes the word "URGENT", or the body of a message, such as text message, that includes the phrase "call me ASAP". In other example, the notification manager may determine that notifications are urgent based on a frequency of messages from a particular sender (e.g., greater than a threshold quantity of messages from the same sender within a pre-defined amount of time, etc.).

While the wearable computing device is described as including the notification manager, one or more other computing devices may include at least a portion of the functionality of the notification manager. For example, the smart phone and/or cloud computing platform may determine one or more notification policies, store the notification policies, and/or distribute the notification policies to one or more user computing devices. As another example, a cloud computing platform may include the notification manager and may receive a command from the wearable computing device (e.g., directly, or indirectly via a companion computing device, such as a mobile phone) to mute notifications on other computing devices associated with the same user account as the wearable computing device. In response to receiving the command, the cloud computing device may send a mute command to the other computing devices associated with the account or may, in some examples, refrain from sending notifications to the other computing devices.

In this way, the notification manager may temporarily restrict a user computing device from outputting notifications. By temporarily restricting notifications across one or more user computing devices, the notification manager may reduce data sent to, or received from, user computing devices, which may reduce network traffic, computations performed by the user computing devices, and power (e.g., battery power) consumed by the user computing devices. Further, temporarily restricting notifications may reduce the number of distractions presented to the user. Reducing distractions may improve the user experience and may increase user safety (e.g., while the user is operating a vehicle).