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PROVISION OF PERSONALIZED DATE-BASED CONTENT

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PROVISION OF PERSONALIZED DATE-BASED CONTENT

ABSTRACT

An interactive assistant computing system, referred to herein as "an interactive assistant," "a virtual assistant," "a computational assistant," or simply an "assistant," is described that stores and/or retrieves information related to items associated with particular days for a user such that the assistant can automatically retrieve one or more items associated with the current day (e.g., a local weather forecast, a current weather report, upcoming calendar items for the current day, current news stories, stock prices, indications of the day having personal importance, etc.) and provide a personalized report that includes the items specific to the current day. The assistant may also provide an audible indication of one or more of the items, such as an audible verbalization of a birthday wish to the user. This way, the assistant can present an improved, personalized indication of important aspects of the current day, eliminating the need for the user to access multiple different applications in order to access information regarding matters of the immediate future.

DESCRIPTION

Assistants execute on counter-top devices, mobile phones, automobiles, and many other type of computing devices. Assistants output useful information, responds to users' needs, or otherwise performs certain operations to help users complete real-world and/or virtual tasks. Some such tasks include maintaining information relevant to a user's activities at particular times and on particular days. While maintaining such information may be beneficial to the user, devices that store such information may not include a technique for organizing such information

in a way that is efficiently beneficial. Such devices may also not assign any personal importance to such activities, only reproducing what the user entered for a particular day.

The computing system shown in Figure 1 below provides users with an ability to access a single interface that will display at least a portion of the information most relevant to the immediate future of the user (e.g., the information associated with anything related to the current day). In a simple case, the user may initiate a feed-producing application for the user's personal items of interest for the current day. The assistant may perform a search in a database, locally and/or via a remote server, to provide the user (e.g., audibly, visually) with search results (e.g., items associated with the current day) in the interface that correspond to the search. By utilizing this single interface, the computing system may facilitate quick and easy access to imminently approaching events and currently relevant information.

In this way, the assistant automatically prepares a complete agenda for the user's current day with all relevant information in a single interface. Rather than the user having to access multiple applications to ascertain different items of relevance, the techniques described herein enable a computing system to gather data from potentially numerous applications that may be relevant to the user. The assistant may also assign any user-specific personal importance to the items retrieved from the various applications (e.g., a birthday of the user, a birthday of a relative or friend of the user, an anniversary of the user, a holiday that the user may celebrate, etc.), providing a more complete description of the current day in a way that is specifically relevant to the user. The techniques described herein have many applications and use cases. Although an assistant in a mobile device is described throughout the disclosure, an assistant executing in any computing environment could benefit from use of the techniques described herein.

Throughout the disclosure, examples are described where devices and systems analyze information (e.g., locations, movements, calendars, communications, settings, etc.) associated with users of the devices and systems only if the devices and systems receive explicit permission from the users to analyze the information. For example, in situations discussed below in which a computing device and/or information server system collects and aggregates contextual information regarding various settings, events, and/or interactions associated with a user, the user may be provided with an opportunity to control whether the devices and/or systems can collect and make use of the information, and to dictate how the devices and systems present information to the user. Additionally, certain data may be treated in one or more ways before the devices and systems store or use the information so that any personally-identifiable information is removed before storage or use. As such, the individual users maintain control over how information is collected about the user and how the information is used by the device and/or system.

Consider the example system shown in Figure 1 which is configured to provide an assistant in accordance with the techniques described herein. The system includes a computing device, which may execute the techniques described herein alone or by communicating with a second computing device across a network.
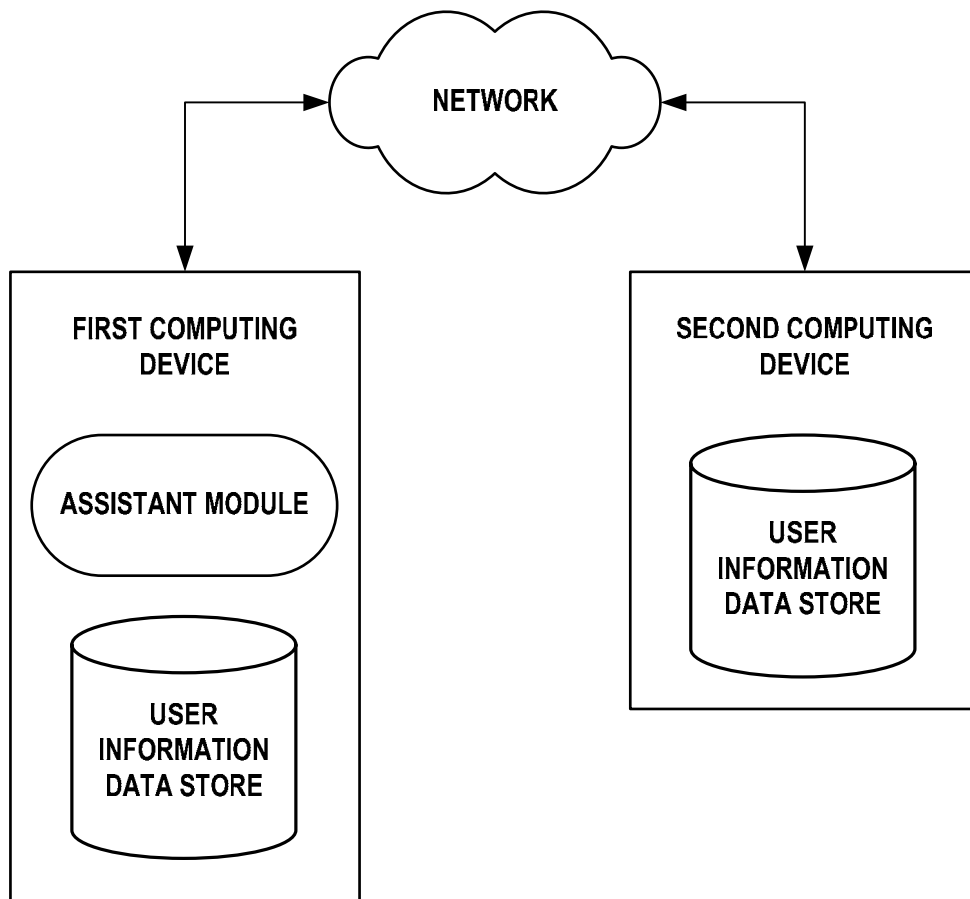
Figure 1

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.

The first computing device with the assistant module and the user information data store may represent any type of computing device, server, or other system that is configured to execute an assistant and communicate on a network. Examples of the first computing device cloud

computing environments, mobile phones, tablet computers, wearable computing devices, countertop computing devices, home automation computing devices, laptop computers, desktop computers, televisions, stereos, automobiles, and all other type of mobile and non-mobile computing device that is configured to execute an assistant.

Similarly, the second computing device (shown only with the user information data store) may represent any type of computing device, server, cloud computing system, or other system that is configured to execute communicate on a network with an assistant-enabled device. The second computing device may not be assistant-enabled itself, although, in some instances, the second computing device may also execute an assistant. In some examples, the second computing device may be shared assets of multiple users. For example, the second computing device may be a server that stores information regarding the user of the first computing device as well as information regarding other users in the user information data store. The second computing device may be configured to send the information regarding the user and the user's activities to the first computing device for analysis by the assistant module.

The assistant module (also referred to as "the assistant") may execute at the assistant-enabled computing device to provide assistant services to users of the assistant-enabled computing device. Examples of assistant services include retrieving multiple items for inclusion in a single interface. The items may be associated with different applications, but each item describes an event or a condition for the current day. These items include a local weather forecast or a current local weather condition from a weather application, upcoming calendar items for the current day from a calendar application, selected news items or current stock prices from a news application, birthday or anniversary indications from a social media application, or

any additional indication of an event taking place on the current day that the assistant may retrieve from an application that executes on a mobile phone.

As a user interacts with various applications executing on the first computing device, the assistant may store indications of such interactions in the user information data store, either on the first computing device itself or in a user information data store on the second device. In general, the assistant may store any update to data in an application where the data is associated with events or updates for a particular date, either in the future or the current date. After receiving explicit permission from the user, the assistant may store the indications at the user information data store and, in the course of providing assistant services, make use of the personal information stored at the user information data store.

At a later time, the user may access the assistant to request a rundown of the current day. Upon receiving an indication of this request, the assistant may access the user information data store to retrieve one or more stored items associated with the current day, where the items may be associated with any of the applications executable by the first computing device. In some instances, the assistant may sort the retrieved items, either in order of time, by the application associated with the item, by the importance of the item, or by any other means that places the items in a coherent order. The assistant may then present the items in a single interface to the user, enabling the user to see all of the events for the current day without having to navigate between multiple applications.

While examples described herein are stated with respect to visual interfaces, the techniques of this disclosure may also be executed with respect to audio interfaces. For instance, after waking up in the morning, the user of the first computing device, using an audio interface, may verbalize a statement directed at the first computing device (e.g., the user may say "good

morning" or ask the first computing device "what is on the agenda for today?"). Similarly, the assistant may access the user information data store to retrieve one or more stored items associated with the current day, where the items may be associated with any of the applications executable by the first computing device. Rather than outputting visual indications of the retrieved items, the first computing device may create an audible indication for each of the retrieved items and output an audio response to the user that provides the created audible indications of the user's scheduled events for the day.

In some examples, the assistant may further personalize the interface by outputting audio alerts for particular items. For instance, if the current day has a particular importance to the user (e.g., it is the user's birthday, it is the birthday of a user's friend or relative, it is the user's anniversary with their spouse, it is a holiday that the user celebrates, etc.), the assistant may output an audible or visual alert commemorating the importance when the user requests the interface for the current day. For instance, if the current day is the user's birthday, the assistant may output an audible alert that vocalizes the phrase "Happy Birthday, Allison!" In other instances, if it is the user's mother's birthday, the assistant may output an audible alert that vocalizes the phrase "Don't forget to call your mother to wish her a happy birthday!" In other instances, if it is the user's anniversary, the assistant may output an audible alert that vocalizes the phrase "Happy anniversary! Don't forget to stop by the flower shop on your way home!" In still other instances, if it is Thanksgiving, the assistant may output an audible alert that vocalizes the phrase "Happy Thanksgiving!"

In this way, the assistant automatically prepares a complete agenda for the user's current day with all relevant information in a single interface and provides the user with a personalized experience in reviewing the agenda. Rather than the user having to access multiple applications

to ascertain different items of relevance, the techniques described herein enable a computing system to gather data from potentially numerous applications that may be relevant to the user. The assistant may also assign any user-specific personal importance to the items retrieved from the various applications (e.g., a birthday of the user, a birthday of a relative or friend of the user, an anniversary of the user, a holiday that the user may celebrate, etc.), providing a more complete description of the current day in a way that is specifically relevant to the user. The techniques described herein have many applications and use cases. Although an assistant in a mobile device is described throughout the disclosure, an assistant executing in any computing environment could benefit from use of the techniques described herein.