ASSISTANCE FOR CALENDAR MILESTONE PLANNING

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ASSISTANCE FOR CALENDAR MILESTONE PLANNING

ABSTRACT

A virtual, intelligent, or computational assistant (e.g., also referred to simply as an “assistant”) is described is configured to aid in user planning, celebrating, or otherwise remembering calendar milestones. The assistant determines steps that other users perform, including what sort of gifts to buy or events to plan, when celebrating or otherwise remembering a calendar milestone (e.g., an anniversary, a birthday, a holiday, or other important date). The assistant determines when an important date of a user will occur and automatically recommend ways for the user to plan for, celebrate, or otherwise remember the date. This way, rather than simply remind a user about an upcoming calendar milestone, the assistant is enabled to help a user prepare for, celebrate, or remember the calendar milestone.

DESCRIPTION

Virtual, intelligent, or computational assistants (e.g., also referred to simply “assistants”) execute on counter-top computing devices, mobile phones, automobiles, and many other types of computing devices. Assistants output useful information, responds to user queries, or otherwise perform certain operations to help users complete real-world and/or virtual tasks. The usefulness of an assistant may depend on what information the assistant already knows about its users or what information the assistant has access to.

The example system shown in FIG. 1 provides an assistant architecture that aids in user planning, celebrating, or otherwise remembering calendar milestones. The assistant learns about special occasions, holidays, and other various important dates, and determines steps that other users perform when celebrating or otherwise remembering a particular important date. For
example, the assistant may determine what gift to buy, which restaurant to attend, what meal to plan, or other event to plan for a particular date. With explicit permission from a user, the assistant may determine when a user should start thinking about planning for an important date on their calendar and at that time, automatically recommend ways for the user to plan for, celebrate, or otherwise remember the date. In some instances, the assistant may offer to perform certain actions on the user’s behalf to help the user prepare for the date. This way, rather than simply remind a user about an upcoming calendar milestone, as other assistant may due, the assistant is enabled to help a user actually prepare for, celebrate, or remember the important date by either performing various actions on behalf of the user or at least facilitate the user in performing such actions.

Further to the descriptions below, a user may be provided with controls allowing the user to make an election as to both if and when the assistant, the computing device, or the computing systems described herein can collect or make use of user information (e.g., information about a user’s social network, social actions or activities, profession, a user’s preferences, or a user’s current location), and if and when the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user’s identity may be treated so that no personally identifiable information can be determined for the user, or a user’s geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.
The system of FIG. 1 includes one or more external systems and a computing device communicating across a network to provide an assistant service that maintains and has access to user information. The network of FIG. 1 represents a combination of any one or more public or private communication networks, for instance, television broadcast 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 computing device represents any type of computing device that is configured to execute an assistant and communicate on a network. The external systems represent any type of server or other computing system that is configured to support the assistants executing at the computing device. The external systems and computing device can be personal computing devices. In some examples, the computing device and external systems may be shared assets of multiple users. Examples of the computing device and the external systems include 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. The computing device and external systems may store or provide access to user information, particularly calendar or schedule information, about users. Examples of user information include: sensor data, calendars, location histories, search histories, messages, e-mails, calendars, schedules, preferences, notes, lists, contacts, other communications, interests, application usage data, past assistant interactions, etc. After receiving explicit permission from a user, the computing device and external systems may store the user information and enable an assistant, or other applications, executing at the computing device and external systems to access the user information.

The external systems and the computing device treat the user information so the user information is protected, encrypted, or otherwise not susceptible to hacking or unauthorized use. The user information may be stored locally at the computing device and/or remotely (e.g., in a cloud computing environment provided by the external systems and which is accessible via the network of FIG. 1).

The computing device includes an assistant that executes across the external systems and the computing device to provide assistant services to users of the computing device. Examples of assistant services include: setting up reminders, creating calendar entries, booking travel, online ordering, sending messages or other communications, controlling televisions, lights, thermostats, appliances, or other computing devices, providing navigational instructions, or any other conceivable task or operation that may be performed by an assistant. The assistant relies
on the supplemental data stored on the computing device or the external systems when interpreting, and determining answers to, user queries.

The assistant learns about special occasions, holidays, and other various important dates, and determines steps that other users perform when celebrating or otherwise remembering a particular important date. Then, in response to determining that an important date is approaching, the assistant offers a user suggestions for celebrating or otherwise remembering the important date.

In some examples, the assistant executes preprogrammed rules that indicate how to plan or what suggestions to make for which important date. For example, with regards to birthdays, the assistant may execute a rule that causes the assistant to always recommend a gift, a card, a cake, a party, a restaurant, or some other tradition that other users typically perform for birthdays. In some examples, the assistant relies on machine learning to infer what a user may want to do to celebrate or otherwise remember an important date, based on information the assistant obtains about how a user or other users celebrate similar important dates. For example, the assistant may generate a rule for planning for a user’s new year’s celebrations after observing how the previous year, the user or other users stocked up on party supplies, searched for appetizer recipes, and bought other items for planning new year’s celebrations. Or the assistant may generate a rule for reminding the user to reserve a reservation or order a ticket to attend a night club, restaurant, or other event.

The rules may be personalized to a particular user or particular type of user based on inferred user interests, preferences, location, or another inferred user trait. For example, the assistant may execute a birthday rule for assisting a user in planning for a family member’s birthday that is different for a rule the assistant executed for helping an employer plan for an
employee’s birthday. Or the assistant may execute a birthday rule that is particular for a particular child’s birthday and is different than a birthday rule the assistant executes for a different child’s birthday.

As a first example, the assistant may access the calendar of a user and determine that a user’s wedding anniversary is in approximately one month. Rather than just output a notification reminding the user to start planning for the wedding anniversary, the assistant first gathers information to help the user plan for the event.

The assistant may execute a rule that indicates to the assistant flowers and dinner are traditional things to remember to purchase or plan for with regards to wedding anniversaries. The assistant may recommend that the user order flowers online for delivery the day of the anniversary and offer to automate that process. With permission from the user, the assistant may order the flowers and arrange for their delivery that day. The assistant may output a recommendation that the user should consider making a dinner reservation so he or she does not forget. The assistant may offer to assist the user in making the reservation either by obtaining more information from the user (e.g., time, location, type of restaurant, or restaurant name) or offering to make the reservation based on past user behavior (e.g., if the user and spouse always go to the same restaurant on their anniversary the assistant may offer to reserve a table at that restaurant).

As a second example, the assistant may access the calendar of a user and determine that for the past several years in June, the user has gone on a backpacking trip with a certain group of friends. The assistant may offer to help in planning for the trip by automatically sending a polling question to the group of friends to get their opinions on what the best weekend for the
trip is, as well as to figure out who is coming and who cannot make it. The assistant may offer to book the canoe rental or shuttle bus for pick up or delivery.

As a third example, the assistant may access the calendar of the user and determine that the user’s eight year old daughter is having a birthday soon and recommend a particular gift, restaurant, song, card, etc. for planning the eight year old girl’s birthday celebration. Similarly, the assistant may determine that the user’s fifteen year old daughter is having a birthday and recommend a different gift, different restaurant, different song, different card, etc. for planning the fifteen year old girl’s birthday celebration.

As another example, the assistant may be aware from past observations about a user’s purchase of flowers, location history, or communications that the anniversary of a parent’s death is nearing. The assistant may recommend that the user send flowers or remember to call the user’s surviving parent.

Lastly, as a final example, the assistant may determine that a local public holiday (to which the user may not celebrate) falls on the same day of the week that the user has reserved for weekly grocery shopping. The assistant may determine that, historically, grocery stores at the user’s location are always closed during that local public holiday. The assistant may recommend that the user complete his or her grocery shopping earlier in the week to avoid going to the store when the store is closed for the holiday.

By learning about how users prepare for, celebrate, or otherwise remember important dates, as opposed to how other assistants may simply generating reminders of when important dates occur, the assistant is enabled to help a user actually prepare for, celebrate, or remember the important date by either performing various actions on behalf of the user or at least facilitate the user in performing such actions. The above examples are just some use cases for the
assistant architecture shown in FIG. 1, the assistant architecture has many other applications and use cases.