April 16, 2015

CALENDAR EVENT MANAGEMENT

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ABSTRACT

A calendar event management system provides additional and improved functionalities to a user of a calendar application. In one embodiment, the calendar event management system calculates a probability of invitees attending an event and displays this calculated probability to all the other invitees. In a second embodiment, the system manages a presentation of notification for calendar events to an event organizer as well as the invitees. In a third embodiment, the system provides a notification for calendar events to a user based on a virtual location of the user.

PROBLEM STATEMENT

Today most of the events for a user are scheduled through electronic communication such as emails, text messages, social networking websites, etc. These events are manually or automatically collated in one or more calendar applications to provide user with a comprehensive and convenient view of all the events scheduled for the user. The existing calendar applications provide various different functionalities to an organizer as well as invitees of an event. For example, the calendar application allows invitees to accept or deny an event invitation so as to inform the event organizer about their attendance for the event. In such scenario, there is no way to know if an invitee will attend or not attend the meeting if they have not responded to the invitation. Additionally, the calendar applications also provides various notifications to the users, e.g., an alert to a user for an event prior to the occurrence of the calendar event. However, in

most cases the user has to select whether to receive such notifications or not and the rule is applied to all events on the calendar. Such a notification system is not very optimal as it does not distinguish between importance and priority of events to provide alerts. An advanced system for managing calendar events and associated notifications is described.

CALENDAR EVENT MANAGEMENT SYSTEM

The systems and techniques described in this disclosure relate to a calendar event management system that optimizes notifications provided to a user of the calendar application. The system can be implemented for use in an Internet, an intranet, or another client and server environment. The system can be implemented as program instructions locally on a client device or implemented across a client device and server environment. The client device can be any electronic device such as a mobile device, a smartphone, a tablet, a handheld electronic device, a wearable device, etc.

The calendar event management system provides additional and improved functionalities to a user of the calendar application. This system can be implemented within a calendar application associated with a user's email account, social networking account, or a stand-alone calendar application. Optionally, it may be one of the tools offered by a third party.

In a first embodiment, the system calculates a probability of invitees attending an event. This calculated probability can be displayed in addition to the explicit input e.g., Attending, Not attending, and No response, provided by the invitee. The system may calculate the probability of the invitee attending the current event based on historical presence information of the invitee for a similar previous event and other signals associated with the current event. The historical

presence information provides information about the attendance of the invitee in a similar previous event. The historical presence information may be tracked over time by the system or can be retrieved by the system from various calendar applications used by the invitee. The historical presence information can be stored at the invitee's electronic device, at a server associated with the calendar application, or in a cloud storage.

The historical presence information for an invitee can include information about connecting / not connecting to the previous meeting audio / video call using invitee's unique id or face recognition run by an event management system. The historical presence information can also be tracked using GPS location of the invitee at the time of the previous event. The invitee's GPS location can either be matched with a venue of the event or with the GPS location of other invitees who attended the event. Alternatively, historical presence information for an invitee can be tracked by detecting invitee's electronic device co-presence with other devices in the event by using Wi-Fi signals, bluetooth signals, infrared signals, ultrasonic pings, similar environmental audio, etc. These other devices may belong to other invitees attending the event or may be other electronic devices e.g., video conferencing system, audio conferencing system associated with the event. Additionally, data from other sensors e.g., accelerometers and gyroscope present in the invitee's electronic device can be used to determine invitee's activity before, after, and during the previous event to gather historical presence information for the invitee in the previous event.

After retrieving the historical presence information for the invitee, the system determines other signals associated with the current event such as if the invitee has indicated that they will attend the specific current event or not versus indicating that they will attend every event in a recurring series, if the invitee has accepted an event that is occurring during the same time

window as the specific current event, if the invitee is in an unusual location or a significantly different time zone compared to the venue of the current event, if the invitee has set an out of office message or not for the time window of the event, if the invitee has registered for vacation days during the time window of the event, etc.

Using the historical presence information and these other signals associated with the current event, the system calculates the probability of the invitee attending the current event. This probability is then displayed on a calendar interface to all the other invitees as well as the organizer, in addition to the explicit invitee input e.g., Attending, Not attending, and No response. Additionally, the system may also sort and present the order of the invitees in the calendar interface based on the increasing / decreasing probability of attending the current event.

In a second embodiment, the system manages a presentation of notification for calendar events to a user. These notifications are provided to the user at a pre-defined time before the occurrence of the event to notify the user of the upcoming event. This pre-defined time can be set by the user. The notification can be audio, visual, or both. The notification can be provided on the user's electronic device via email, SMS, calendar alert, or a stand-alone third party alert.

In one example, at the time of event creation, most calendar applications provide the user with an option to set a level of notification delivery for the event. The level may include receiving notification via email only, calendar only, SMS at a user's registered mobile number, both email and SMS, etc. The level can also include how many times and at what interval the notification should be provided to the user. The user may select a particular level or may not make any selection at all.

In either case, the calendar event management system can change the user selected level based on metadata of the event. The metadata may include a type (e.g., personal, official), title, location, invitees, time, etc of the event. The system may provide a score to each option for all these factors, each factor having a different weight, and accordingly calculates an importance score. Based on the calculated importance score, the system changes the level of notification delivery for the event. For example, the system may automatically set the level of notification delivery to "3 times before the event at one hour difference by email and SMS" for a dinner with spouse at a fancy restaurant. Whereas, the system may automatically set the level of notification delivery to "1 time before the event by calendar notification" for a department wide meeting on a video conference. Similarly, the system may automatically set the level of notification delivery to "none" for a city wide meeting on art and museums. The system may ask for user's explicit permission to access the metadata and other relevant information from user's linked accounts.

In another example, the system manages a presentation of notification for calendar events to an invitee. The system monitors a read state of an event, a current time and location of the invitee, and a time and venue of occurrence of the event. Based on these monitored parameters, the system generates and provides a notification to the invitee.

The system may monitor the read state of the event to determine if the user is aware about the existence of the event in his/her calendar. The read state can be monitored by checking if the event has been displayed on a screen of the user's device using page load, window focus, eye tracking, etc. Alternatively, or additionally, the system can also monitor user's other channels of communication (e.g., chat, email, in-person conversations) related to the event to determine if the user is aware about the existence of the event. Upon determining that the user is

not aware about the existence of the event, the system retrieves the current time and location of the invitee as well as the time and venue of the event. Based on this retrieved information, the system calculates a time required for the invitee to reach the venue at the time of the event and accordingly provides a notification to the invitee. This notification is displayed to the user regardless of the user's setting to show or not show notifications for any event.

For example, the system may determine that a user has not read an event for team meeting. The system retrieves a current time (i.e., 2 pm) and location (Building C, 4th floor) of the user and a time (i.e., 3 pm) and venue (i.e., Building A, 6th floor) of the occurrence of the event. Based on this retrieved information, the system calculates that the user may take 20 minutes to reach the venue by walk and accordingly presents a notification to the user at 2:30 pm providing enough time for the user to reach the venue as well as some buffer. The system may retrieve the user's location using known techniques such as GPS, RF triangulation, etc.

In a third embodiment, the system provides a notification for calendar events to a user based on a virtual location of the user. The user may create calendar events such as reminders for themselves or for others to help remember a task to perform. A notification for such reminders is usually generated based on a trigger which is defined by the user while creating the reminder. These triggers are usually time or geo-location based. For example, remind me to "Buy milk" at "5:30 pm today" or remind me to "Buy milk" when I am at "Sector-56, New Delhi." The system provides a notification to the user when the trigger condition is met. The system compares the trigger condition with a current time or location of the user. The current location can be determined by using known techniques such as GPS, RF triangulation, etc.

The system further adds the capability to use a web page address as a trigger condition for reminders. For example, the user can create an event - “remind me” to “Buy milk” from “Instacart” or “remind me” to “Buy diapers” from “Amazon.” In these examples, the system, with explicit user permission, tracks the web page being visited by the user and compares it with the one provided as the trigger condition. The system then provides a notification when the trigger condition is met. For example, the system provides a visual notification on the user’s screen to “buy diapers” when the system detects that the user is visiting Amazon web page.

Fig. 1 is a block diagram of an exemplary environment that shows components of a system for implementing the techniques described in this disclosure. The environment includes client devices 110, servers 130, and network 140. Network 140 connects client devices 110 to servers 130. Client device 110 is an electronic device. Client device 110 may be capable of requesting and receiving data/communications over network 140. Example client devices 110 are personal computers (e.g., laptops), mobile communication devices, (e.g. smartphones, tablet computing devices), set-top boxes, game-consoles, embedded systems. Client device 110 may execute an application, such as a web browser 312 or 314 or a native application 316 such as a calendar application. Web applications 113 and 115 may be displayed via a web browser 112 or 114. Server 130 may be a web server capable of sending, receiving and storing web pages 132. Web page(s) 132 may be stored on or accessible via server 130. Web page(s) 132 may be associated with web application 113 or 115 and accessed using a web browser, e.g., 112. When accessed, webpage(s) 132 may be transmitted and displayed on a client device, e.g., 110. Resources 118 and 118’ are resources available to the client device 110 and/or applications thereon, or server(s) 130 and/or web pages(s) accessible therefrom, respectively. Resources 118’

may be, for example, memory or storage resources; a text, image, video, audio, JavaScript, CSS, or other file or object; or other relevant resources. Network 140 may be any network or combination of networks that can carry data communication.

The subject matter described in this disclosure can be implemented in software and/or hardware (for example, computers, circuits, or processors). The subject matter can be implemented on a single device or across multiple devices (for example, a client device and a server device). Devices implementing the subject matter can be connected through a wired and/or wireless network. Such devices can receive inputs from a user (for example, from a mouse, keyboard, or touchscreen) and produce an output to a user (for example, through a display). Specific examples disclosed are provided for illustrative purposes and do not limit the scope of the disclosure.

DRAWINGS

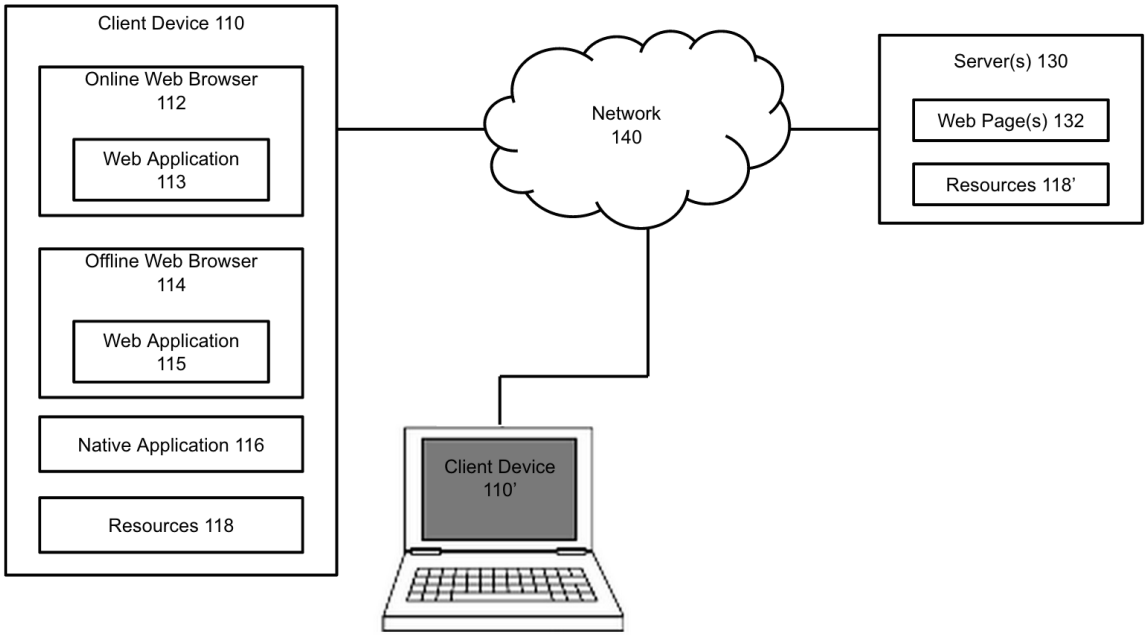

Fig. 1