Title: AUGMENTING CONTENT OBTAINED FROM DIFFERENT CONTENT SOURCES

Abstract: An online service stores and augments aggregated content that is obtained from different content sources. For example, the content may include electronic messages, calendars, contacts, social network content, feed data, search results, and the like. The online service augments the aggregated content to include additional content. The online service may augment the aggregated content differently based on the type of the content being augmented. For example, electronic messages may be augmented differently as compared to when augmenting calendar events or contact cards. Searches may be made across all or a portion of the different content sources that are aggregated and augmented for a user. For example, a user may view the messages from a particular user regardless of the message provider providing the content to the user. Similarly, a user may perform a general search across each of the different content sources to locate items matching a search query.

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

— as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

Published:

— with international search report (Art. 21(3))

— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(hi))
AUGMENTING CONTENT OBTAINED FROM DIFFERENT CONTENT SOURCES

BACKGROUND

[0001] Personal Information Manager (PIM) applications are commonly used by computer users. PIM applications are used for recording, tracking, and managing content for a user. For example, a user may use a PIM application to access email, contacts and calendar information from one or more providers. The content that is used by the PIM application may be obtained from a variety of different content sources.

SUMMARY

[0002] This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

[0003] An online service stores and augments aggregated content that is obtained from different content sources. For example, the content may include electronic messages, calendars, contacts, social network content, feed data, search results, and the like. The online service augments the aggregated content to include additional content. The additional content may come from the aggregated data as well as from other content sources. For example, calendar events may be augmented to include: traffic information, driving directions, news information, weather information, related events, and the like. The online service may augment the aggregated content differently based on the type of the content being augmented. For example, electronic messages may be augmented differently as compared to when augmenting calendar events or contact cards. Searches may be made across all or a portion of the different content sources that are aggregated and augmented for a user. For example, a user may view the messages from a particular user regardless of the message provider providing the content to the user. Similarly, a user may perform a general search across each of the different content sources to locate items matching a search query.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] FIGURE 1 shows a system including an online service that augments content that is obtained from different content sources;

[0005] FIGURE 2 illustrates a synchronization engine included in an online service that augments content that is obtained from different content sources;
[0006] FIGURE 3 shows calendar views with augmented content;

[0007] FIGURE 4 shows an augmented user defined event on a calendar;

[0008] FIGURE 5 shows an augmented contact card;

[0009] FIGURE 6 illustrates a user sending an electronic message that is augmented with additional content;

[0010] FIGURE 7 illustrates a user accessing an online service and performing a search across different content sources;

[0011] FIGURE 8 illustrates augmenting aggregated content;

[0012] FIGURE 9 illustrates an exemplary online system for augmenting aggregated content; and

[0013] FIGURES 10, 11A, 11B and 12 and the associated descriptions provide a discussion of a variety of operating environments in which embodiments of the invention may be practiced.

**DETAILED DESCRIPTION**

[0014] Referring now to the drawings, in which like numerals represent like elements, various embodiment will be described.

[0015] FIGURE 1 shows a system including an online service that augments content that is obtained from different content sources.

[0016] As illustrated, system 100 includes application(s) 110, content sources 120, search 130, online service 105, aggregated content 135, content manager 26, tablet computing device 140, and computing device 150.

[0017] Content manager 26 is configured to augment content that is obtained from different content sources. According to an embodiment, the content is aggregated by the online (e.g. "Cloud") service 105 and is stored by the online service 105. For example, the aggregated content may be stored in a data store (e.g. aggregated content 135). The content sources 120 that are aggregated may include many different types of content. For example, the content sources may include content relating to electronic messages, calendars (public, private), contacts, social network content, feed data, search results, and the like.

[0018] Using content manager 26, online service 105 aggregates content for different users based on the configuration settings that are associated with a user. For example, a user may configure their personal information manager (PIM) application to include mail, contacts, and calendars from different service providers. The user may also configure their PIM application to include contacts from a social network, as well as calendar events from
one or more content sources. Instead of a client PIM application accessing each of the individual content providers and storing the content, online service 105 obtains and aggregates the content that is obtained from the different content sources for the user. According to an embodiment, service 105 stores each user’s data that is obtained from each content source separately.

[0019]  Content manager 26 augments the aggregated content 135 to include additional content. For example, calendar events may be augmented to include: traffic information, driving directions, news information, weather information, related events, and the like. Generally, the content is augmented to include additional information relating to the content. Online service 105 may augment the aggregated content differently based on the type of the content being augmented. For example, electronic messages may be augmented differently as compared to when augmenting calendar events or contact cards.

[0020]  As illustrated in FIGURE 1, tablet computing device 140 shows an electronic message that includes augmented content 142. In the current example, augmented content 142 includes restaurant information and search results that related to the message. The message may be augmented with other content.

[0021]  Calendar 155, shows a weekly view of a calendar that includes different events. Zero or more calendar events may be augmented. According to an embodiment, a user configures settings that specify different options for augmenting content. For example, a user may specify that work events are to be augmented using a first set of content sources and that personal events are to be augmented using a different set of content sources. In the current example, augmented content is shown on April 16th. The augmented content may include different content. For example, the augmented content may include traffic information, driving directions, location information, restaurant information, social network posts, news feeds, and the like.

[0022]  Changes made to the aggregated content on the client may be synchronized with the external content source. For example, in response to a user making a change to an email that is associated with a different email provider, content manager 26 synchronizes the change with the different email provider.

[0023]  According to an embodiment, notification of changes to the content is also shown. The changes may be to content that is either augmented or not augmented. For example, the notification of changes shows the events that have changed since the last time the user looked at the calendar. The notification of changes may be shown in the same user interface window or another user interface window. For example, a pop-up
window (e.g., Notification of Changes 160) may be displayed to show the changes to the calendar. As another example, a notification pane may be displayed that displays what events or content have recently changed. For instance, when a user views their calendar, they may notice that a Sounders event has changed since the last time they looked at my calendar. We “augment” the data even further than we already do in order to show the user what changed for them since the last time they looked at the data.

[0024] Online service 105 may perform processing on the augmented aggregated content before it is displayed or delivered to the user on a client computing device. For example, one or more views may be generated by content manager 26 and stored by the online service 105 before the view is requested from the client computing device.

[0025] In order to facilitate communication with content manager 26, one or more callback routines, may be implemented. Application(s) 110 may be a variety of applications, such as PIM applications, business productivity applications, entertainment applications, music applications, travel applications, video applications, and the like. Generally, application(s) 110 may be any application that includes content that may be aggregated. The application(s) 110 may be configured to receive different types of input (e.g. speech input, touch input, keyboard input (e.g. a physical keyboard and/or Software Input Panel (SIP)) and/or other types of input.

[0026] System 100 as illustrated comprises one or more touch screen input devices, such as tablet computing device 140, that detects when a touch input has been received (e.g. a finger touching or nearly touching the touch screen). Any type of touch screen may be utilized that detects a user’s touch input. For example, the touch screen may include one or more layers of capacitive material that detects the touch input. More details are provided below.

[0027] FIGURE 2 illustrates a synchronization engine included in an online service that augments content that is obtained from different content sources.

[0028] As illustrated, system 200 includes content sources 120, synchronization engine 220, content manager 26 including aggregator 250 and augmenter 260, data store 230, online service 105, client 270 and other clients 275. Instead of a client connecting with each different service provider to obtain content, service 105 using content manager 26 obtains and aggregates content from content sources 120. According to an embodiment, a client (e.g. client 270) may use a single protocol to communicate with the different content obtained by online service 105.
As discussed above, content sources 120 may include many different content sources. For example, content sources 120 may include: feed sources; Personal Information Management (PIM) sources (e.g. OUTLOOK, GMAIL, YAHOO) that include content relating to electronic messages, calendars, tasks, and the like; social network sources (e.g. TWITTER, FACEBOOK, LINKEDIN ...); weather sources; entertainment sources; map and navigation sources; public calendar sources, private calendar sources, and the like. Generally, a content source may be any source from which content may be obtained from and aggregated for a user.

Each client (user) may determine what content they would like aggregated. For example, when a user first accesses online service 105, they may configure what content sources they would like to include (e.g. mail from GMAIL and YAHOO, as well as OUTLOOK email). The user may also select social network sources (e.g. YAMMER, SHAREPOINT, FACEBOOK, TWITTER, ...), feeds, and the like. For example, the user may select to include contacts and contact info, FACEBOOK, GMAIL, TWITTER, LINKEDIN, and the like.

In response to the user selections of the content sources, content manager 26 uses aggregator 250 to obtain the content from the content source. The retrieved content is stored in the online service 105 in data store 230. According to an embodiment, each content source that is selected by a user to be aggregated is stored separately within data store 230. In other words, the content from one content source is not mixed with content from another content source. According to another embodiment, the content sources may be stored mixed within data store 230.

Aggregator 250 may obtain content from the content sources in response to different events. For example, aggregator 250 may obtain content periodically, in response to a notification, or in response to some other event.

Synchronization engine 220 is configured to act as an interface between the online service 105 and the content sources. Different content sources may use different protocols 216 to allow access to content in a content source. For example, the Internet Message Access Protocol (IMAP) is a generic protocol for email that may be used by one or more content sources. Other common protocols include Exchange Web Service (EWS), Messaging Application Programming Interface (MAPI), Exchange Active Sync (EAS), Post Office Protocol (POP), Simple Mail Transfer Protocol (SMTP), as well as many other protocols that may be associated with accessing and interacting with content in a content source. Some content sources may use their own defined protocol or may modify a
common protocol. Synchronization engine 220 interacts with each content source using the protocol that is associated with the content source being accessed.

[0034] According to an embodiment, synchronization engine 220 is configured to aggregate provider specific content. Instead of just using a generic protocol (e.g. IMAP, MAPI, ...) to obtain content from each content source, specific provider synchronization interfaces 218 may be created and used to obtain content from the content source. For example, the provider specific interfaces 218 may obtain information form the provider for one or more provider specific features. For example, a provider specific interface to the GMAIL service may obtain labels in GMAIL and map that information to the same feature or another feature used when a client accesses the GMAIL content (e.g. map label in GMAIL to a mail folder). According to another embodiment, the provider synchronization interfaces 218 may be configured to maintain the use of provider specific features. Generally, the provider specific interfaces 218 are configured to access features of a service provider that are not available using a common protocol that is associated with the service provider. For example, while mail may be obtained from a mail service provider using a protocol, the defined protocol may not provide functionality to interface with all of the different features that are provided by the service provider.

[0035] According to an embodiment, synchronization engine 220 is configured to allow two-way synchronization between the different content sources and data store 230 in the online service. For example, a user (e.g. client 270) may make a change to an email that was obtained from a different mail service provider that is synchronized back to the different service provider. As another example, a user may add a folder in the client that translates in mapping the folder to a label. The provider synchronization interface logic is specific logic that applies to each content provider. Content may be synchronized to different fidelity levels.

[0036] The aggregated content for a user may be augmented with additional content using augmenter 260. The content may be augmented in response to an item being created (e.g. an appointment, a message) and/or augmented at some other time. For example, the content may be aggregated when the user opens a view of the content.

[0037] The following examples of augmenting content are examples, and are not intended to be limiting. A view of a user’s calendar may be augmented using public calendar feeds. For example, the calendar feeds could be sports calendars, school calendars, social experiences, home schedules, and the like. Information relating to the calendar may also be obtained from other sources. A search may automatically be
performed to locate content that is referenced in a message, in a calendar, in a task, and the like. For example, when viewing the calendar that includes a schedule of games, the scores of the games may automatically be added to the view after performing a search for the score.

[0038] Instead of each client having to obtain the content directly from the content sources using the different protocols and storing the aggregated information on the client computing device, the online service 105 stores the content, performs the aggregation, and augments the content.

[0039] Client 270 interacts with the online service 105 using a single protocol even though online service used many different protocols to obtain the aggregated content. According to an embodiment, client 270 is a thin and portable client (e.g. it does not need to include the synchronization logic, protocols and other functionality that online service 105 includes).

[0040] Content manager 26 is also configured to create view(s) 265 of content before it is requested by a client. For example, a common view (e.g. a weekly view) of a user’s calendar may be created in advance of the view being requested. The aggregated content may be organized into different views (e.g. month view, week view, …). Each different view contains the data used to render the UI for that view. When the user opens a calendar, a current view may be loaded from memory (e.g. a cache). Other stored view data is delivered to the user when requested. Data views may also be created for other common views (e.g. contacts, mail, tasks, …).

[0041] FIGURE 3 shows calendar views with augmented content.

[0042] As illustrated, FIGURE 3 shows calendar view 310 and calendar view 350.

[0043] Calendar view 310 shows a month view of April that includes augmented content and user content. As illustrated, calendar view 310 shows two user entered events (April 9th and April 22nd) and three soccer games (April 5th, April 19th, and April 26th) that were added to the calendar. In the current example, the user selected to augment their calendar with the Sounders soccer team schedule. As discussed herein, the user may select to augment their calendar, or other content (e.g. emails, contacts, tasks, …) with other content. Looking at April 5th on calendar view 310 it can be seen that the score of the Sounders game was 2-1. The score may be obtained from a web page, a news story, a search, and the like. According to an embodiment, the augmented content may be updated with other content. In the current example, the score of the game may be included in the calendar view as the game is occurring and/or after the completion of the game.
As illustrated in calendar view 310, user 320 has selected April 19th to change the month view to a day view. Display 350 shows the day view for April 19th. As can be seen, additional augmented content may be seen in the day view as compared to the month view. Augmented content 360 shows traffic information related to the Sounders games, Sounders news, and recent posts about the Sounders. More or less augmented content may be included. For example, directions, a map, player profiles, and the like may be used to augment the content.

The augmented content may be obtained from the content sources selected by the user and/or from other content sources. For example, augmented content may be automatically obtained by performing a search using a search engine (e.g. MICROSOFT BING) related to the event on the calendar. The augmented content may be updated manually or automatically. For example, a user may refresh the content and/or the augmented content is periodically updated.

FIGURE 4 shows an augmented user defined event on a calendar.

As illustrated, FIGURE 4 shows calendar view 410 and calendar view 450.

Calendar view 410 shows a month view of April that includes augmented content and user content. As illustrated, calendar view 410 shows one user entered event (April 17th) and three soccer games (April 5th, April 19th, and April 26th) that were added to the calendar as augmented content.

As illustrated, user 420 has selected April 17th to change the month view to a day view. Display 450 shows the day view for April 17th. As can be seen, additional augmented content may be seen in the day view as compared to the month view. Augmented content 460 shows direction and traffic information and information relating to Bellevue Square. According to an embodiment, a user sets preferences on what augmented content to add to calendar events. For example, a user may set preferences to obtain information related to a destination and traffic information. Another user may specify other preferences.

FIGURE 5 shows an augmented contact card.

Display 510 shows an exemplary contact card for User 1. The contact card includes contact information (e.g. name, company, title, web page address, phone numbers, ...) and augmented content 520. Augmented content 520 may include a variety of different contact. For example, social network posts related to User 1, recent messages from/to User 1, news stories about User 1, and the like. In the current example, user 530 selects the display of augmented content 520.
Display 550 illustrates a larger view 560 of augmented content 520 that has been updated. A user may switch back to the contact view by selecting an option.

FIGURE 6 illustrates a user sending an electronic message that is augmented with additional content.

Display 610 shows a user creating an email to User 1 that is about the best restaurants in Seattle. The body of the message 614 may include different content such as text, pictures, and the like.

Display 650 illustrates User 1 viewing the message with augmented content 660. According to an embodiment, electronic messages may be augmented with content based on the content of the message. A user may specify preferences on what information (if any) in a message may be accessed and used to obtain augmented content. For example, a user may specify that the subject may be used but that content in the body of the message may not be used. Another user may specify that the message body and other content in the message may be used.

In the current example, augmented content 660 includes restaurant reviews for restaurants listed in the message as well as restaurant availability for a period of time. For example, a content source may be a reservation service for restaurants.

FIGURE 7 illustrates a user accessing an online service and performing a search across different content sources.

Display 710 shows user performing “Search 1” 720 to locate items from different content sources. The different content sources may include content that is augmented by the online service. The user may select the content sources that they would like searched. In response to performing “Search 1” 720, results 730 are shown. As can be seen, different items from different content sources that were aggregated for the user were located in the search. Instead of the user having to search each different content source separately, two or more content sources may be searched at a single time.

Display 750 shows user performing a search to locate the message from User 1 across different content sources. The user may select the content sources that they would like searched. In response to performing search 760, results 770 are shown. As can be seen, messages from different content sources and message providers are shown on a single display. Instead of the user having to search each different content source separately for messages from the user, two or more content sources may be searched at a single time.

FIGURE 8 illustrates augmenting aggregated content. When reading the discussion of the routines presented herein, it should be appreciated that the logical
operations of various embodiments are implemented (1) as a sequence of computer
implemented acts or program modules running on a computing system and/or (2) as
interconnected machine logic circuits or circuit modules within the computing system. The
implementation is a matter of choice dependent on the performance requirements of the
computing system implementing the invention. Accordingly, the logical operations
illustrated and making up the embodiments described herein are referred to variously as
operations, structural devices, acts or modules. These operations, structural devices, acts
and modules may be implemented in software, in firmware, in special purpose digital
logic, and any combination thereof. While the operations are shown in a particular order,
the order of the operations may change, be performed in parallel, depending on the
implementation.

[0061] After a start operation, the process moves to operation 810, where aggregated
content is accessed in the online service. For example, an online service accesses content
that it aggregated and that is stored by the online service. According to an embodiment,
each user's aggregated content from each of the different content sources that are
aggregated is stored separately. For example, if a user selects to aggregate content from
three different content sources, each of the content sources are stored individually within
the online service.

[0062] Transitioning to operation 820, a type of the aggregated content to display is
determined. According to an embodiment, the type of aggregated content relates to content
used by a PIM service or application such as electronic messages, contacts, calendars,
tasks, and the like. Other types of content may be aggregated, such as social network
content, news feeds, and the like.

[0063] Flowing to operation 830, additional content is obtained. The additional content
is content that is used to augment the aggregated information. The additional content may
be obtained from the content that is already aggregated for the user and/or from other
content sources. For example, a search may be performed to locate other content, different
websites may be accessed, different data stores may be accessed, and the like.

[0064] Transitioning to operation 840, the aggregated content for the user is augmented.
For example, traffic information and directions may be included in an appointment for a
user that is not located at the user's office. As another example, sports sources may be
accessed to update scores that are displayed in a calendar. Similarly, social network posts
may be used to augment contact cards. Messages may be accessed from different content
sources and displayed within a user's contact card.
Moving to operation 850, the augmented content is delivered to the client. According to an embodiment, the online service generates and stores common views for a user before the view is requested by the user. For example, a common view (e.g., a weekly view) of a user’s calendar may be created in advance of the view being requested. The aggregated content may be organized into different views (e.g., month view, week view, …). Each different view contains the data used to render the UI for that view. When the user opens a calendar, a current view may be loaded from memory (e.g., a cache). Other stored view data is delivered to the user when requested. Data views may also be created for other common views (e.g., contacts, mail, tasks, …).

The process flows to an end operation and returns to processing other actions.

FIGURE 9 illustrates an exemplary online system for augmenting aggregated content. As illustrated, system 1000 includes service 1010, data store 1045, touch screen input device 1050 (e.g., a tablet/slate), smart phone 1030 and display device 1080.

As illustrated, service 1010 is a cloud based and/or enterprise based service that may be configured to provide services, such as PIM services. Service 1010 may be configured to provide other services. The service may be interacted with using different types of input/output. For example, a user may use speech input, touch input, hardware based input, and the like. Functionality of one or more of the services/applications provided by service 1010 may also be configured as a client/server based application.

As illustrated, service 1010 is a multi-tenant service that provides resources 1015 and services to any number of tenants (e.g., Tenants 1-N). Multi-tenant service 1010 is a cloud based service that provides resources/services 1015 to tenants subscribed to the service and maintains each tenant’s data separately and protected from other tenant data.

System 1000 as illustrated comprises a touch screen input device 1050 (e.g., a slate/tablet device) and smart phone 1030 that detects when a touch input has been received (e.g., a finger touching or nearly touching the touch screen). Any type of touch screen may be utilized that detects a user’s touch input. For example, the touch screen may include one or more layers of capacitive material that detects the touch input. Other sensors may be used in addition to or in place of the capacitive material. For example, Infrared (IR) sensors may be used. According to an embodiment, the touch screen is configured to detect objects that in contact with or above a touchable surface. Although the term "above" is used in this description, it should be understood that the orientation of the touch panel system is irrelevant. The term "above" is intended to be applicable to all such orientations. The touch screen may be configured to determine locations of where
touch input is received (e.g. a starting point, intermediate points and an ending point). Actual contact between the touchable surface and the object may be detected by any suitable means, including, for example, by a vibration sensor or microphone coupled to the touch panel. A non-exhaustive list of examples for sensors to detect contact includes pressure-based mechanisms, micro-machined accelerometers, piezoelectric devices, capacitive sensors, resistive sensors, inductive sensors, laser vibrometers, and LED vibrometers.

[0071] According to an embodiment, smart phone 1030, touch screen input device 1050, and device 1080 are configured with applications (1031, 1051, 1081) to interact with aggregated content that is augmented by service 1010.

[0072] As illustrated, touch screen input device 1050, smart phone 1030, and display device 1080 shows exemplary displays 1052/1032/1082 showing the use of an application, such as a PIM application that receives augmented content from service 1010. Data may be stored on a device (e.g. smart phone 1030, touch screen input device 1050 and/or at some other location (e.g. network data store 1045). Data store 1045, or some other store, may be used to store aggregated content as well as other data. The applications used by the devices may be client based applications, server based applications, cloud based applications and/or some combination. According to an embodiment, display device 1080 is a device such as a MICROSOFT XBOX coupled to a display.

[0073] Content manager 26 is configured to perform operations relating to augmenting content as described herein. While manager 26 is shown within service 1010, the functionality of the manager may be included in other locations (e.g. on smart phone 1030 and/or touch screen input device 1050 and/or device 1080).

[0074] The embodiments and functionalities described herein may operate via a multitude of computing systems including, without limitation, desktop computer systems, wired and wireless computing systems, mobile computing systems (e.g., mobile telephones, netbooks, tablet or slate type computers, notebook computers, and laptop computers), hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, minicomputers, and mainframe computers.

[0075] In addition, the embodiments and functionalities described herein may operate over distributed systems (e.g., cloud-based computing systems), where application functionality, memory, data storage and retrieval and various processing functions may be operated remotely from each other over a distributed computing network, such as the Internet or an intranet. User interfaces and information of various types may be displayed
via on-board computing device displays or via remote display units associated with one or more computing devices. For example user interfaces and information of various types may be displayed and interacted with on a wall surface onto which user interfaces and information of various types are projected. Interaction with the multitude of computing systems with which embodiments of the invention may be practiced include, keystroke entry, touch screen entry, voice or other audio entry, gesture entry where an associated computing device is equipped with detection (e.g., camera) functionality for capturing and interpreting user gestures for controlling the functionality of the computing device, and the like.

FIGURES 10-12 and the associated descriptions provide a discussion of a variety of operating environments in which embodiments of the invention may be practiced. However, the devices and systems illustrated and discussed with respect to FIGURES 10-12 are for purposes of example and illustration and are not limiting of a vast number of computing device configurations that may be utilized for practicing embodiments of the invention, described herein.

FIGURE 10 is a block diagram illustrating physical components (i.e., hardware) of a computing device 1100 with which embodiments of the invention may be practiced. The computing device components described below may be suitable for the computing devices described above. In a basic configuration, the computing device 1100 may include at least one processing unit 1102 and a system memory 1104. Depending on the configuration and type of computing device, the system memory 1104 may comprise, but is not limited to, volatile storage (e.g., random access memory), non-volatile storage (e.g., read-only memory), flash memory, or any combination of such memories. The system memory 1104 may include an operating system 1105 and one or more program modules 1106 suitable for running software applications 1120 such as the content manager 26. The operating system 1105, for example, may be suitable for controlling the operation of the computing device 1100. Furthermore, embodiments of the invention may be practiced in conjunction with a graphics library, other operating systems, or any other application program and is not limited to any particular application or system. This basic configuration is illustrated in FIGURE 9 by those components within a dashed line 1108. The computing device 1100 may have additional features or functionality. For example, the computing device 1100 may also include additional data storage devices (removable and/or non-removable) such as, for example, magnetic disks, optical disks, or tape. Such
additional storage is illustrated in FIGURE 10 by a removable storage device 1109 and a non-removable storage device 1110.

[0078] As stated above, a number of program modules and data files may be stored in the system memory 1104. While executing on the processing unit 1102, the program modules 1106 (e.g., the content manager 26) may perform processes including, but not limited to, one or more of the stages of the methods and processes illustrated in the figures. Other program modules that may be used in accordance with embodiments of the present invention may include electronic mail and contacts applications, word processing applications, spreadsheet applications, database applications, slide presentation applications, drawing or computer-aided application programs, etc.

[0079] Furthermore, embodiments of the invention may be practiced in an electrical circuit comprising discrete electronic elements, packaged or integrated electronic chips containing logic gates, a circuit utilizing a microprocessor, or on a single chip containing electronic elements or microprocessors. For example, embodiments of the invention may be practiced via a system-on-a-chip (SOC) where each or many of the components illustrated in FIGURE 10 may be integrated onto a single integrated circuit. Such an SOC device may include one or more processing units, graphics units, communications units, system virtualization units and various application functionality all of which are integrated (or “burned”) onto the chip substrate as a single integrated circuit. When operating via an SOC, the functionality, described herein, with respect to the content manager 26 may be operated via application-specific logic integrated with other components of the computing device 1100 on the single integrated circuit (chip). Embodiments of the invention may also be practiced using other technologies capable of performing logical operations such as, for example, AND, OR, and NOT, including but not limited to mechanical, optical, fluidic, and quantum technologies. In addition, embodiments of the invention may be practiced within a general purpose computer or in any other circuits or systems.

[0080] The computing device 1100 may also have one or more input device(s) 1112 such as a keyboard, a mouse, a pen, a sound input device, a touch input device, etc. The output device(s) 1114 such as a display, speakers, a printer, etc. may also be included. The aforementioned devices are examples and others may be used. The computing device 1100 may include one or more communication connections 1116 allowing communications with other computing devices 1118. Examples of suitable communication connections 1116 include, but are not limited to, RF transmitter, receiver, and/or transceiver circuitry; universal serial bus (USB), parallel, and/or serial ports.
[0081] The term computer readable media as used herein may include computer storage media. Computer storage media may include volatile and non-volatile, removable and non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, or program modules. The system memory 1104, the removable storage device 1109, and the non-removable storage device 1110 are all computer storage media examples (i.e., memory storage.) Computer storage media may include RAM, ROM, electrically erasable read-only memory (EEPROM), flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other article of manufacture which can be used to store information and which can be accessed by the computing device 1100. Any such computer storage media may be part of the computing device 1100. Computer storage media does not include a carrier wave or other propagated or modulated data signal.

[0082] Communication media may be embodied by computer readable instructions, data structures, program modules, or other data in a modulated data signal, such as a carrier wave or other transport mechanism, and includes any information delivery media. The term “modulated data signal” may describe a signal that has one or more characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio frequency (RF), infrared, and other wireless media.

[0083] FIGURES 11A and 11B illustrate a mobile computing device 1200, for example, a mobile telephone, a smart phone, a tablet personal computer, a laptop computer, and the like, with which embodiments of the invention may be practiced. With reference to FIGURE 10A, one embodiment of a mobile computing device 1200 for implementing the embodiments is illustrated. In a basic configuration, the mobile computing device 1200 is a handheld computer having both input elements and output elements. The mobile computing device 1200 typically includes a display 1205 and one or more input buttons 1210 that allow the user to enter information into the mobile computing device 1200. The display 1205 of the mobile computing device 1200 may also function as an input device (e.g., a touch screen display). If included, an optional side input element 1215 allows further user input. The side input element 1215 may be a rotary switch, a button, or any other type of manual input element. In alternative embodiments, mobile computing device 1200 may incorporate more or less input elements. For example, the display 1205 may not
be a touch screen in some embodiments. In yet another alternative embodiment, the mobile computing device 1200 is a portable phone system, such as a cellular phone. The mobile computing device 1200 may also include an optional keypad 1235. Optional keypad 1235 may be a physical keypad or a “soft” keypad generated on the touch screen display. In various embodiments, the output elements include the display 1205 for showing a graphical user interface (GUI), a visual indicator 1220 (e.g., a light emitting diode), and/or an audio transducer 1225 (e.g., a speaker). In some embodiments, the mobile computing device 1200 incorporates a vibration transducer for providing the user with tactile feedback. In yet another embodiment, the mobile computing device 1200 incorporates input and/or output ports, such as an audio input (e.g., a microphone jack), an audio output (e.g., a headphone jack), and a video output (e.g., a HDMI port) for sending signals to or receiving signals from an external device.

[0084] FIGURE 11B is a block diagram illustrating the architecture of one embodiment of a mobile computing device. That is, the mobile computing device 1200 can incorporate a system 1202 (i.e., an architecture) to implement some embodiments. In one embodiment, the system 1202 is implemented as a “smart phone” capable of running one or more applications (e.g., browser, e-mail, calendaring, contact managers, messaging clients, games, and media clients/players). In some embodiments, the system 1202 is integrated as a computing device, such as an integrated personal digital assistant (PDA) and wireless phone.

[0085] One or more application programs 1266 may be loaded into the memory 1262 and run on or in association with the operating system 1264. Examples of the application programs include phone dialer programs, e-mail programs, personal information management (PIM) programs, word processing programs, spreadsheet programs, Internet browser programs, messaging programs, and so forth. The system 1202 also includes a non-volatile storage area 1268 within the memory 1262. The non-volatile storage area 1268 may be used to store persistent information that should not be lost if the system 1202 is powered down. The application programs 1266 may use and store information in the non-volatile storage area 1268, such as e-mail or other messages used by an e-mail application, and the like. A synchronization application (not shown) also resides on the system 1202 and is programmed to interact with a corresponding synchronization application resident on a host computer to keep the information stored in the non-volatile storage area 1268 synchronized with corresponding information stored at the host computer. As should be appreciated, other applications may be loaded into the memory.
1262 and run on the mobile computing device 1200, including the content manager 26 as described herein.

[0086] The system 1202 has a power supply 1270, which may be implemented as one or more batteries. The power supply 1270 might further include an external power source, such as an AC adapter or a powered docking cradle that supplements or recharges the batteries.

[0087] The system 1202 may also include a radio 1272 that performs the function of transmitting and receiving radio frequency communications. The radio 1272 facilitates wireless connectivity between the system 1202 and the “outside world”, via a communications carrier or service provider. Transmissions to and from the radio 1272 are conducted under control of the operating system 1264. In other words, communications received by the radio 1272 may be disseminated to the application programs 1266 via the operating system 1264, and vice versa.

[0088] The visual indicator 1220 may be used to provide visual notifications, and/or an audio interface 1274 may be used for producing audible notifications via the audio transducer 1225. In the illustrated embodiment, the visual indicator 1220 is a light emitting diode (LED) and the audio transducer 1225 is a speaker. These devices may be directly coupled to the power supply 1270 so that when activated, they remain on for a duration dictated by the notification mechanism even though the processor 1260 and other components might shut down for conserving battery power. The LED may be programmed to remain on indefinitely until the user takes action to indicate the powered-on status of the device. The audio interface 1274 is used to provide audible signals to and receive audible signals from the user. For example, in addition to being coupled to the audio transducer 1225, the audio interface 1274 may also be coupled to a microphone to receive audible input, such as to facilitate a telephone conversation. In accordance with embodiments of the present invention, the microphone may also serve as an audio sensor to facilitate control of notifications, as will be described below. The system 1202 may further include a video interface 1276 that enables an operation of an on-board camera to record still images, video stream, and the like.

[0089] A mobile computing device 1200 implementing the system 1202 may have additional features or functionality. For example, the mobile computing device 1200 may also include additional data storage devices (removable and/or non-removable) such as, magnetic disks, optical disks, or tape. Such additional storage is illustrated in FIGURE
11B by the non-volatile storage area 1268. Mobile computing device 1200 may also include peripheral device port 1230.

[0090] Data/information generated or captured by the mobile computing device 1200 and stored via the system 1202 may be stored locally on the mobile computing device 1200, as described above, or the data may be stored on any number of storage media that may be accessed by the device via the radio 1272 or via a wired connection between the mobile computing device 1200 and a separate computing device associated with the mobile computing device 1200, for example, a server computer in a distributed computing network, such as the Internet. As should be appreciated such data/information may be accessed via the mobile computing device 1200 via the radio 1272 or via a distributed computing network. Similarly, such data/information may be readily transferred between computing devices for storage and use according to well-known data/information transfer and storage means, including electronic mail and collaborative data/information sharing systems.

[0091] FIGURE 12 illustrates an embodiment of an architecture of an exemplary system, as described above. Content developed, interacted with, or edited in association with the content manager 26 may be stored in different communication channels or other storage types. For example, various documents may be stored using a directory service 1322, a web portal 1324, a mailbox service 1326, an instant messaging store 1328, or a social networking site 1330. The content manager 26 may use any of these types of systems or the like for enabling data utilization, as described herein. A server 1320 may provide the content manager 26 to clients. As one example, the server 1320 may be a web server providing the content manager 26 over the web. The server 1320 may provide the content manager 26 over the web to clients through a network 1315. By way of example, the client computing device may be implemented as the computing device 1100 and embodied in a personal computer, a tablet computing device 1310 and/or a mobile computing device 1200 (e.g., a smart phone). Any of these embodiments of the client computing device 1100, 1310, and 1200 may obtain content from the store 1316.

[0092] Embodiments of the present invention, for example, are described above with reference to block diagrams and/or operational illustrations of methods, systems, and computer program products according to embodiments of the invention. The functions/acts noted in the blocks may occur out of the order as shown in any flowchart. For example, two blocks shown in succession may in fact be executed substantially concurrently or the
blocks may sometimes be executed in the reverse order, depending upon the functionality/acts involved.

[0093] The description and illustration of one or more embodiments provided in this application are not intended to limit or restrict the scope of the invention as claimed in any way. The embodiments, examples, and details provided in this application are considered sufficient to convey possession and enable others to make and use the best mode of claimed invention. The claimed invention should not be construed as being limited to any embodiment, example, or detail provided in this application. Regardless of whether shown and described in combination or separately, the various features (both structural and methodological) are intended to be selectively included or omitted to produce an embodiment with a particular set of features. Having been provided with the description and illustration of the present application, one skilled in the art may envision variations, modifications, and alternate embodiments falling within the spirit of the broader aspects of the general inventive concept embodied in this application that do not depart from the broader scope of the claimed invention.
CLAIMS

1. A method for augmenting aggregated content that is stored by a cloud service, comprising:
   accessing aggregated content that is obtained from different content sources and is stored by the cloud service for a user;
   augmenting the aggregated content to include additional content using the cloud service; and
   delivering the augmented content to a client according to a delivery protocol.

2. The method of Claim 1, wherein augmenting the aggregated content to include the additional content using the cloud service comprises obtaining the additional content that is related to a subject of a calendar event and a location of the calendar event.

3. The method of Claim 1, wherein augmenting the aggregated content to include the additional content using the cloud service comprises determining the additional content from the aggregated content that is stored for the user and other content that is obtained from an external content source.

4. The method of Claim 1, wherein accessing the aggregated content that is obtained from different content sources and is stored by the cloud service for the user comprises accessing electronic message information, calendar information, and content information.

5. The method of Claim 1, wherein augmenting the aggregated content to include additional content using the cloud service comprises augmenting at least one of: an electronic message, a calendar event, and a contact card.

6. The method of Claim 1, further comprising updating the augmented content in response to receiving a selection of the augmented content.

7. A computer-readable medium storing computer-executable instructions for augmenting aggregated content that is stored by a cloud service, comprising:
   accessing aggregated content including calendar content and electronic message content that is obtained from different content sources and is stored by the cloud service for a user;
   augmenting the aggregated content to include additional content using the cloud service; and
   delivering the augmented content to a client according to a single delivery protocol.
8. A system for augmenting aggregated content that is stored by a cloud service, comprising:
   a processor and memory;
   an operating environment executing using the processor; and
   an content manager that is configured to perform actions comprising:
   accessing aggregated content including electronic message content, calendar content and contact card content that is obtained from different content sources and is stored by the cloud service for a user;
   augmenting at least one of an electronic message, a calendar event or a contact card to include additional content using the cloud service; and
   delivering the augmented content to a client according to a single delivery protocol.

9. The system of Claim 8, wherein augmenting the aggregated content to include the additional content using the cloud service comprises including public content including social network content that is obtained from another content source that is based on information included in the aggregated content.

10. The system of Claim 8, further comprising generating a view of the augmented content at the cloud service that includes a notification of changes to the content since a last viewing time before delivering the augmented content to the client.
### April 2013

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- **Monday 7th**: 2PM User Event
- **Wednesday 21st**: 7PM User Event
- **Friday 5th**: Sounders 2-1
- **Saturday 19th**: 12PM Sounders
- **Sunday 6th**: Current Date

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**Saturday**

- 19

- 12PM Sounders

- Traffic
- Sounders News
- Recent Posts

Augmented Content 360

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**FIG. 3**
START

Access Aggregated Content in Online Service

Determine Type of Aggregated Content to Display

Access Other Aggregated Content

Access Other Content (e.g. feeds, travel, search, ...)

Obtain Additional Content

Augment Aggregated Content

Provide Augmented Content to Client

END

FIG. 8
Fig. 11B
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06Q10/10
ADD.

According to International Patent Classification (IPC) or both national classification and IPO

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06Q G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C.

See patent family annex.

Date of the actual completion of the international search
21 October 2014

Date of mailing of the international search report
28/10/2014

Name and mailing address of the ISA/
European Patent Office, P.B. 5815 Patentlaan 2
NL-2280 HV Rijswijk
Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer
Targon, Valerio
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