Providing content and/or functionality through a display of a locked computing device. Configuration data defined by a user or application vendor identifies the content and/or functionality to be made available. Upon receipt of the content, the computing device modifies the received content based on the configuration data and provides the modified content to the user through the display of the locked computing device. The computing device also interacts with the user in accordance with the functionality identified by the configuration data. In some embodiments, notifications about voice mail or electronic mail messages are displayed to the user through a locked touch screen display. Responsive to a finger tap or other user input, additional yet limited information relating to the notifications is displayed.
FIG. 2

RECEIVE NOTIFICATIONS?

YES

GENERATE REPRESENTATIONS OF THE NOTIFICATIONS

PRESENT THE REPRESENTATIONS TO THE USER

NO

ANIIMATE THE REPRESENTATIONS

ORGANIZE THE REPRESENTATIONS BY TYPE
FIG. 3

LEGEND

- HOME ALWAYS FALLING
- TEXT
- EMAILS
- CALLS
- OR
- PAPER AIRPLANE
- LEAF

3G

Missed text SAM

12:30

Missed call GEORGE
FIG. 4A

Email from MARCO

FIG. 4B

3G INBOX

PIVOT < MESSAGES > PIVOT

SUE THOMPSON
Instructions for Client

PETER HOUSTON
Request is not out of date

MARCO SANTOS
Experience tree forum

CHARLES FITZGERALD
List of applications added

EVA VALVERDE
Demo meeting summary

OPEN DELETE
GLANCEABLE ANIMATED NOTIFICATIONS ON A LOCKED DEVICE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of pending U.S. Provisional Application No. 61/119,806, filed Dec. 4, 2008, the entirety of which is hereby incorporated by reference herein.

BACKGROUND

[0002] Visual interfaces such as touch screens are available on most electronic devices, including mobile telephones with integrated personal digital assistant (PDA) features. The touch screens display graphics and text and enter commands to control the devices or to perform various other functions to execute operations on the device. Many screens, whether touch sensitive or not, automatically lock to prevent unintentional data entry.

[0003] However, when notifications about electronic mail messages, text messages, or the like are received by the device, the user has to unlock the device (e.g., after entering an unlock code) to view any portion of the notifications. With existing systems, the user is unable to view, let alone interact with, the notifications with the device locked.

SUMMARY

[0004] Embodiments of the invention provide information about notifications in a display of a locked computing device. A computing device receives a plurality of notifications. Each of the notifications has one or more characteristics. The characteristics for each of the notifications include a type associated with the notification. Representations of the accessed notifications are generated based at least on the associated characteristics. The generated representations are presented to a user by animating, based at least on the characteristics, the generated representations across a display of the computing device. The generated representations presented on the display are organized by the type associated with each of the generated representations.

[0005] 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.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 is an exemplary block diagram illustrating a computing device for displaying notifications to a user.

[0007] FIG. 2 is an exemplary flow chart illustrating the presentation of notifications to the user.

[0008] FIG. 3 is an exemplary user interface illustrating the animation of incoming notifications to the user.

[0009] FIG. 4A and FIG. 4B are exemplary user interfaces illustrating the user selecting one of the notifications to unlock the computing device and execute an application program.

[0010] FIG. 5A through FIG. 5D are exemplary user interfaces illustrating the display of detailed information about incoming notifications.

[0011] Corresponding reference characters indicate corresponding parts throughout the drawings.

DETAILED DESCRIPTION

[0012] Referring to the figures, embodiments of the disclosure enable, at least, the display of notifications 114 to a user 104 on a computing device 102 while the computing device 102 is in a locked state. In some embodiments, the notifications 114 are displayed in real-time and provide information about received electronic mail messages, text messages, voice mail messages, and the like. The notifications 114 are displayed as interactive representations that convey different levels of the information at a glance (e.g., from detailed information to summary information). Further embodiments enable the user 104 to provide a command (e.g., a pre-defined gesture) that automatically unlocks the computing device 102 and performs additional actions (e.g., execute one or more application programs 118).

[0013] While aspects of the invention are described with reference to the computing device 102 being a mobile computing device such as a mobile telephone or a mobile netbook, embodiments of the invention are operable with any computing device. For example, aspects of the invention are operable with devices such as digital cameras, digital video cameras, laptop computers, gaming consoles (including handheld gaming consoles), portable music players, a personal digital assistant, an information appliance, and a personal communicator.

[0014] Further, the computing device 102 may be locked such that access to the full capabilities of the computing device 102 is unavailable, user data entry is disabled, or interaction by the user 104 with the computing device 102 is otherwise limited. In some embodiments, the locked computing device 102 may be unlocked through entry of one or more of the following: a code, a gesture, and a button press.

[0015] Referring again to FIG. 1, an exemplary block diagram illustrates the computing device 102 for displaying (e.g., animating) notifications 114 to the user 104. The computing device 102 includes at least a memory area 110, a display 108, and a processor 106. The memory area 110 stores one or more application programs 118 executing on the computing device 102. The memory area 110, or other computer-readable media, further stores one or more content items 112 received by the computing device 102 while the computing device 102 is locked. The content items 112 include any data received by the computing device 102 from, for example, content providers 128. In some embodiments, the content items 112 include notifications 114 relating to one or more of the following: an electronic mail message, a voice mail message, a text message, a missed telephone call, a Really Simple Syndication (RSS) feed, and an update from a social networking web site. In other embodiments, the content items 112 include news alerts, weather alerts, sports score updates, stock price alerts, transportation schedules (e.g., airline delays or train schedules), instant or chat messages, social networking updates, network connectivity and availability, battery strength of a device associated with the user 104, and the like. In still other embodiments, the notifications 114 extend beyond communications and alert the user 104 to contextual information. For example, the user 104 may be alerted that a friend is nearby (e.g., proximity), that a geoplaced image exists at the present location of the user 104, or that a nearby store is selling an item on a to-do list of the user 104.
Each of the notifications 114 has one or more characteristics 116 associated therewith. The characteristics 116 are represented by, for example, metadata and describe a type, category, classification, quantity, time stamp, priority, importance level, or other descriptor of the notifications 114. The characteristics 116 may be stored in one or more data structures and may be stored as plain text, encrypted, binary, or any other form. Additionally, the characteristics 116 may be organized into a hierarchy, with some characteristics 116 applying to one or more of the notifications 114.

The characteristics 116 may be defined by the user 104 or by the content providers 128. For example, the characteristics 116 may accompany each of the notifications 114 received from the content providers 128. The characteristics 116 may represent a default setting, and may be overridden by the user 104 in some embodiments.

The memory area 110, or one or more computer-readable media, further stores computer-executable components for implementing aspects of the disclosure. Exemplary components include a communication component 120, an icon component 122, an animation component 124, and an interface component 126. These components are described below with reference to FIG. 2.

In general, the memory area 110 is associated with the computing device 102. For example, in FIG. 1, the memory area 110 is within the computing device 102. However, the memory area 110 or any of the data stored thereon may be associated with any server or other computer, local or remote from the computing device 102 (e.g., accessible via a network).

The display 108 includes any component for providing information to the user 104. For example, the display 108 includes any capacitive display capable of sensing touch input from the user 104 or another object such as a stylus. While aspects of the invention are described with reference to the display 108 being a touch sensitive or touch screen display, embodiments of the invention are operable with any display. For example, aspects of the invention are operable with non-touch sensitive displays such as found on devices that have a full or partial keyboard available for data entry. In such examples, the computing device 102 locks by disabling the keyboard from being used as a user input selection device for the computing device 102.

The processor 106 includes any quantity of processing units, and is programmed to execute computer-executable instructions for implementing aspects of the disclosure. The instructions may be performed by the processor 106 or by multiple processors executing within the computing device 102, or performed by a processor external to the computing device 102 (e.g., by a cloud service). In some embodiments, the processor 106 is programmed to execute instructions such as those illustrated in the figures (e.g., FIG. 2).

Some embodiments include the computing device 102 disconnected from a network 130. In such an embodiment, the content items 112 may include notifications 114 such as alarm alerts originating from the computing device 102 (e.g., not received from the content providers 128).

Referring next to FIG. 2, an exemplary flow chart illustrates the presentation of notifications 114 to the user 104 while the computing device 102 is locked. At 202, one or more notifications 114 are received. Alternatively or in addition, the notifications 114 are received (e.g., asynchronously) into the memory area 110 and then subsequently accessed at regular intervals for processing by the computing device 102.

Representations of the notifications 114 are generated at 204 based at least on the characteristics 116 associated with the notifications 114. For example, icons or other graphic elements are selected or generated (e.g., feathers, rocks, balloons, etc.). If the characteristics 116 indicate that a particular notification 114 is of high importance, the representation is selected accordingly. For example, the important notification 114 may be represented as a large rocket ship, while a less important notification 114 may be represented as a small feather.

The representations of the notifications 114 may be homogenous and behave differently to help distinguish importance. For example, a small balloon representation conveys less importance than a large balloon representation. Further, a feather falling slowly conveys less importance than a feather that continually floats until the user 104 selects the feather.

The representations are presented to the user 104. For example, the representations are animated at 206 across the display 108 based at least on the characteristics 116 of the notifications 114 associated with the representations. In the previous example, the rocket ship may be shown blasting across the display 108 of the locked computing device 102, while the feather may be shown floating gently down the display 108 of the locked computing device 102.

At 208, the representations are organized or sorted by type. The type is determined from the characteristics 116 associated with the notifications 114 associated with the representations. For example, voice mail notifications are collected into one pile, while another pile represents received electronic mail message notifications. The organization operation at 208 may elsewhere in the flow illustrated in FIG. 2. For example, the organization may occur anytime after 202.

In some embodiments, the representations are organized into groups sized according to a quantity of the representations in each of the groups. For example, a large pile of representations of a first type indicates that many notifications 114 of that first type have been received, while a small pile of representations of a second type indicate that only a few notifications 114 of that second type have been received.

In some embodiments, input is received from the user 104 while the computing device 102 is locked. The input is associated with one or more of the presented representations. The input corresponds to one or more actions to perform on the associated representation, while the computing device 102 is locked. For example, the user 104 may select one of the displayed notifications 114 (e.g., an electronic mail message). The selection may occur via buttons or other input selection means on the computing device 102 (e.g., with a non-touch screen display) or via a gesture (e.g., with a touch screen display). The gesture indicates the action to perform, and different gestures provide different levels of information about the notification 114. Exemplary gestures include single- or multi-touch gestures including a double-tap, slide left, slide right, flick, or any other input gesture via a finger, stylus, or the like. Alternatively or in addition, the notification 114 may be selected when the user 104 drags or slides one of the representations across and/or off the display 108.

In embodiments in which the computing device 102 is a mobile computing device having one or more accelerometers, the input from the user 104 includes movement of the mobile computing device by the user 104 (e.g., shake, flick, flip, tilt, roll, etc.). In such embodiments, data indicating the...
movement of the mobile computing device is received from the accelerometer. The data is used to identify the action to perform (e.g., shake corresponds to one action, while flick corresponds to another). In addition, the received data indicating the movement of the mobile computing device causes the re-animation of the displayed notifications 114, such as shown in FIG. 5D.

[0030] The action corresponding to the selected notification 114 is performed responsive to the received input while the computing device 102 is locked. For example, a subject line, recipient name, and possibly a portion of content from the body of the message are displayed to the user 104 responsive to the selection of the notification 114, while the computing device 102 is still locked. The additional information displayed to the user 104 may be specified by the characteristics 116 associated with each of the notifications 114. For example, if the received notifications 114 have one or more data fields associated therewith, one or more of the data fields may be selected for presentation based on the characteristics 116 of the notifications 114.

[0031] In other embodiments, the actions corresponding to the selected notification 114 include unlocking the computing device 102 and executing a particular application program 118. In an email example, the actions include executing a mailbox program to display a message corresponding to one of the displayed representations.

[0032] In some embodiments, the operations illustrated in FIG. 2 are performed by the components stored in the memory area 110 (e.g., see FIG. 1). For example, the communication component 120 receives the notifications 114 while the computing device 102 is locked. The icon component 122 generates representations of the notifications 114 received by the communication component 120 based at least on the associated characteristics 116. The animation component 124 presents, to the user 104, the representations generated by the icon component 122. For example, the animation component 124 animates, based at least on the characteristics 116, the representations across the display 108 of the locked computing device 102 and groups the generated representations presented on the display 108 based at least on the associated characteristics 116. The grouped representations are sized visually based on a quantity of representations associated with each of the groups. The interface component 126 receives, from the user 104, input associated with one or more of the representations presented by the animation component 124. The received input is used to identify the actions to perform with respect to the representations. The computing device 102 performs the actions while the computing device 102 is locked.

[0033] Alternatively or in addition, some of the operations in FIG. 2 are performed by a cloud service. For example, the cloud service receives the content items 112 (e.g., from the content providers 128), identifies the representations, and instructs the computing device 102 to display the identified representations. Such an embodiment offloads the processing from the computing device 102 to the cloud service to enable the computing device 102 to reduce the computational burden on the computing device 102 (e.g., improve response time, reduce power consumption, reduce heat generation) or reduce the hardware needs of the computing device 102 (e.g., less processing capability, less memory space, etc.).

[0034] Referring next to FIG. 3, a system 300 includes an exemplary user interface 302 illustrating the animation of incoming notifications 114 to the user 104, and a legend 304 showing the available notification representations. The user interface 302 is associated with, for example, a mobile computing device. In this example, the mobile computing device includes a touch sensitive display and the mobile computing device has been locked. The mobile computing device may have been locked, for example, after an explicit command from the user 104 or after expiration of a predefined period of inactivity by the user 104. When the user 104 presses the power button or performs another input to wake up the mobile computing device, the interface in FIG. 3 is displayed.

[0035] The legend 304 identifies a plurality of representations and their corresponding notification types. For example, a thick-edged feather corresponds to notifications 114 received from a contact designated as "home" by the user 104. This representation is visually striking and noticeable because of the importance placed on notifications 114 from home. Other representations include feathers of varying colors, patterns, or styles that each correspond to different notifications 114 (e.g., text, emails, and calls). For example, email notifications are represented by blue feathers, whereas phone-related notifications are shown as red feathers. Representations other than feathers include paper airplanes, leaves, or snowflakes. For example, different color airplanes or types of airplane correspond to the different notification types. In another example, large oak leaves correspond to important notifications 114, while small ficus leaves correspond to less important notifications 114. In some embodiments, the falling objects are animated with proper physics (e.g., physical properties) to convey realistic motion of the object. For example, light objects fall slowly while heavy objects fall quickly to show importance. In general, the representations provide the user 104 with information about the notifications 114 at a glance while the computing device 102 is locked.

[0036] In the user interface 302 of FIG. 3, a feather indicating that a text message has been received from Sam is falling or floating down the user interface 302 into a pile. Another feather indicating that a voice call from George was missed is also floating down the user interface 302 into a separate pile.

[0037] Referring next to FIG. 4A and FIG. 4B, an exemplary user interface 402 illustrates the user 104 selecting one of the representations to unlock the computing device 102 and execute one of the application programs 118. In the example of FIG. 4A, the representation corresponding to an email message from Marco is floating down the user interface 402. While the computing device 102 is locked, the user 104 selects this representation (e.g., via a press-and-hold gesture on the touch screen) and then slides or drags the selected representation off the display 108. In some embodiments, such a gesture corresponds to an action to execute the application program 118 (e.g., an email program) associated with the selected representation. However, any recognized gesture may be associated with this functionality (e.g., slide the representation in a pre-defined direction or pattern). As shown in FIG. 4B, responsive to the received input gesture and representation selection, the computing device 102 automatically unlocks and executes the email program to display the contents of the email message from Marco. In other embodiments, the user 104 is directed to an unlock screen (e.g., a PIN input screen) responsive to the input gesture from the user 104 to receive the unlock PIN from the user 104 before allowing the user 104 to fully access the application program 118.
In other embodiments, the computing device 102 remains locked while a subset of the functionality of the application program 118 is made available to the user 104 through the locked display 108. For example, the user 104 may interactively select the fields of the email message to view (e.g., sender, time stamp, subject line, list of attachments, etc.).

Referring next to FIG. 5A through FIG. 5D, exemplary user interfaces 502 illustrate the display of detailed information about incoming notifications 114. In FIG. 5A, representations of notifications 114 fall down the user interface 502 of the computing device 102. In FIG. 5B, additional information for each of the representations is shown. The additional information may be displayed based on a user preference or setting, or a setting from the content providers 128 providing the notifications 114 corresponding to the representations.

In FIG. 5C, the representations have fallen into piles and no longer display any detailed information about their respective notifications 114. At a glance, the user 104 can view the piles to see a rough quantity of missed notifications 114 organized by type. With a shake or flip of the computing device 102 as shown in FIG. 5D, the notifications 114 are tossed out of the piles. Alternatively, or in addition, the user 104 may flick up one or more of the piles by touching the pile and making a gesture upwards on the display 108. These actions disperse the contents of the piles. As the representations float around the user interface 502 of the display 108 responsive to these actions, additional information about some of the notifications 114 is displayed (e.g., a summary of each notification 114). The user 104 views this additional information and is able to select one or more of the floating representations (e.g., by grabbing the representations with a finger or stylus). Responsive to the selection, more detailed information about the notification 114 corresponding to the representation is displayed, or the application program 118 associated with the selected representation is executed after the computing device 102 is automatically unlocked. Aspects of the disclosure enable the user 104 to selectively view the notifications 114 in a particular category or of a particular type.

ADDITIONAL EXAMPLES

The user 104, the application developers, or other entities may customize various aspects of the representations of the notifications 114. Such customization may be stored as, for example, part of the characteristics 116 associated with the notifications 114. The customization includes, but is not limited to, one or more of the following: shapes, symbols, sizes, colors, animation, or other artwork. For example, the icons may be displayed as fish, rocks, or other objects, and there may be different layouts depending on whether the computing device 102 is being held by the user 104 in a portrait or landscape orientation.

In some embodiments, the notifications 114 are received by the computing device 102 and processed as next described. The received notifications 114 are routed internally in the computing device 102 to a router designated for handling incoming notifications 114. A database or other data structure is updated with information describing the receipt of the notifications 114. A service listens for updates to the database. Upon detection of the notifications 114, a device registry is updated. A component implementing the lock screen listens for the updates to the device registry.

Exemplary Operating Environment

By way of example and not limitation, computer readable media comprise computer storage media and communication media. Computer storage media store information such as computer readable instructions, data structures, program modules or other data. Communication media typically embody 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 include any information delivery media. Combinations of any of the above are also included within the scope of computer readable media.

Although described in connection with an exemplary computing system environment, embodiments of the invention are operational with numerous other general purpose or special purpose computing system environments or configurations. Examples of well known computing systems, environments, and/or configurations that may be suitable for use with aspects of the invention include, but are not limited to, mobile computing devices, personal computers, server computers, hand-held or laptop devices, multiprocessor systems, gaming consoles, microprocessor-based systems, set top boxes, programmable consumer electronics, mobile telephones, network PCs, minicomputers, mainframe computers, distributed computing environments that include any of the above systems or devices, and the like.

Embodiments of the invention may be described in the general context of computer-executable instructions, such as program modules, executed by one or more computers or...
other devices. The computer-executable instructions may be organized into one or more computer-executable components or modules. Generally, program modules include, but are not limited to, routines, programs, objects, components, and data structures that perform particular tasks or implement particular abstract data types. Aspects of the invention may be implemented with any number and organization of such components or modules. For example, aspects of the invention are not limited to the specific computer-executable instructions or the specific components or modules illustrated in the figures and described herein. Other embodiments of the invention may include different computer-executable instructions or components having more or less functionality than illustrated and described herein.

[0050] Aspects of the invention transform a general-purpose computer into a special-purpose computing device when configured to execute the instructions described herein.

[0051] The embodiments illustrated and described herein as well as embodiments not specifically described herein but within the scope of aspects of the invention constitute exemplary means for identifying to the user 104 the notifications 114 and one or more of the characteristics 116 while the mobile computing device is locked, and exemplary means for interacting with the user 104 to present detail data associated with the notifications 114.

[0052] The order of execution or performance of the operations in embodiments of the invention illustrated and described herein is not essential, unless otherwise specified. That is, the operations may be performed in any order, unless otherwise specified, and embodiments of the invention may include additional or fewer operations than those disclosed herein. For example, it is contemplated that executing or performing a particular operation before, contemporaneously with, or after another operation is within the scope of aspects of the invention.

[0053] When introducing elements of aspects of the invention or the embodiments thereof, the articles “a,” “an,” “the,” and “said” are intended to mean that there are one or more of the elements. The terms “comprising,” “including,” and “having” are intended to be inclusive and mean that there may be additional elements other than the listed elements.

[0054] Having described aspects of the invention in detail, it will be apparent that modifications and variations are possible without departing from the scope of aspects of the invention as defined in the appended claims. As various changes could be made in the above constructions, products, and methods without departing from the scope of aspects of the invention, it is intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. A system for animating notifications in a display of a locked mobile computing device, said system comprising:

   a memory area for storing one or more notifications received by a mobile computing device while the mobile computing device is locked, each of the notifications having one or more characteristics associated therewith; and

   a processor programmed to:

   access a plurality of the notifications stored in the memory area;

   generate representations of the accessed notifications based at least on the characteristics associated therewith;

   sort the generated representations based at least on the characteristics associated therewith;

   present the sorted representations to a user by animating, based at least on the characteristics, the sorted representations across a display of the locked mobile computing device;

   receive, from the user, input associated with one or more of the presented representations, said input corresponding to an action to perform on said one or more of the presented representation; and

   perform said corresponding action while the mobile computing device is locked.

2. The system of claim 1, wherein the mobile computing device comprises at least one accelerometer, and wherein the processor is further programmed to:

   receive, via the accelerometer, data indicating movement of the mobile computing device; and

   identify said action based on the received data.

3. The system of claim 2, wherein the received data indicates a flip or shake of the mobile computing device, and wherein the processor is further programmed to re-animate the presented notification based on the flip or shake.

4. The system of claim 1, wherein the display comprises a touch-sensitive display, and wherein the processor is programmed to receive the input from the user by detecting said one of the presented notifications being dragged across the display by the user.

5. The system of claim 1, wherein the display is touch-sensitive, and wherein the processor is further programmed to:

   receive a gesture via the touch-sensitive display; and

   identify said action based on the received gesture.

6. The system of claim 1, wherein the notifications relate to one or more of the following: an electronic mail message, a voice mail message, a text message, and a missed telephone call.

7. The system of claim 1, further comprising means for identifying to the user the notifications and one or more of the characteristics while the mobile computing device is locked.

8. The system of claim 1, wherein the notifications have detail data associated therewith, and further comprising means for interacting with the user to present the detail data to the user.

9. The system of claim 1, wherein the characteristics include one or more of the following: a type, a quantity, a timestamp, and a priority.

10. A method comprising:

    accessing a plurality of notifications received by a computing device, each of the notifications having one or more characteristics associated therewith, said characteristics including a type associated with the notification;

    generating representations of the accessed notifications based at least on the characteristics associated therewith; and

    presenting the generated representations to a user by:

    animating, based at least on the characteristics, the generated representations across a display of the computing device; and

    organizing the generated representations presented on the display by the type associated with each of the generated representations.

11. The method of claim 10, further comprising:

    receiving, from the user while the computing device is locked, input associated with one or more of the pre-
presented representations, said input corresponding to an action to perform on said one or more of the presented representation; and
performing said corresponding action while the computing device is locked.

12. The method of claim 10, wherein organizing the generated representations comprises organizing the representations into groups sized according to a quantity of the representations associated therewith.

13. The method of claim 10, further comprising: receiving from the user a selection of one of the presented notifications while the device is locked; and unlocking the locked computing device and executing an application program associated with the selected one of the presented notifications.

14. The method of claim 13, wherein receiving the selection from the user comprises detecting said one of the presented notifications being dragged across the display by the user.

15. The method of claim 10, wherein accessing the plurality of notifications comprises accessing the plurality of notifications while the computing device is locked.

16. The method of claim 10, wherein generating the representations comprises generating representations that have physical properties corresponding to the associated characteristics.

17. One or more computer-readable media having computer-executable components, said components comprising: a communication component for receiving a plurality of notifications by a computing device while the computing device is locked, each of the notifications having one or more characteristics associated therewith;

an icon component for generating representations of the notifications received by the communication component based at least on the characteristics associated therewith;

an animation component for presenting to a user the representations generated by the icon component by: animating, based at least on the characteristics, the representations across a display of the locked computing device; and

grouping the generated representations presented on the display based at least on the characteristics associated therewith, said grouped representations being sized visually based on a quantity of representations associated therewith;

an interface component for receiving, from the user, input associated with one or more of the representations presented by the animation component, said received input corresponding to an action to perform with respect to said one or more of the representation, wherein the computing device performs said corresponding action while the computing device is locked.

18. The computer-readable media of claim 17, wherein the animation component animates the representations based on the associated characteristics.

19. The computer-readable media of claim 18, wherein the animation component animates the representations based on the physical properties.

20. The computer-readable media of claim 17, wherein the interface component receives the input by receiving a gesture from the user.

* * * * *