Pierce Declaration

EXHIBIT 26

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This has been brought to your attention so that you will know it has not been overlooked.

PATENT APPLICATION SERIAL NO _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

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PTO/SB/16 (08-03)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No. EV526570459US

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Additional inventors are being named on the 1 *separately numbered sheets attached hereto*

TITLE OF THE INVENTION (500 characters max)

ENHANCED PORTABLE DEVICE NAVIGATION TOOLS

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OR

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ENCLOSED APPLICATION PARTS *(check all that apply)*

☑ Specification *Number of Pages* 75 ☐ CD(s), Number

☑ Drawing(s) *Number of Sheets* 54 ☑ Other (specify) Express Mail Certificate

☑ Application Data Sheet. See 37 CFR 1.76

METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

☐ Applicant claims small entity status. See 37 CFR 1.27.

☐ A check or money order is enclosed to cover the filing fees.

☐ The Director is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number:

☑ Payment by credit card. Form PTO-2038 is attached.

FILING FEE Amount ($): 200.00

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

☑ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number are:

Respectfully submitted,

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Date September 16, 2005

REGISTRATION NO. 40,894 *(if appropriate)*

Docket Number: MS314939.01 / MSFTP1182US

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop Provisional Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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PTO/SB/17 (12-04)
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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

FEE TRANSMITTAL
For FY 2005

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 450.00

Complete if Known	
Application Number	
Filing Date	Herewith
First Named Inventor	David Wayne Flynt
Examiner Name	
Art Unit	
Attorney Docket No.	MS314939.01 / MSFTP1182US

METHOD OF PAYMENT (check all that apply)

☐ Check ☑ Credit Card ☐ Money Order ☐ None ☐ Other (please identify): _____

☑ Deposit Account Deposit Account Number: 50-1063 Deposit Account Name: Amin & Turocy, LLP

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☐ Charge fee(s) indicated below, **except for the filing fee**

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FEE CALCULATION

1. BASIC FILING, SEARCH, AND EXAMINATION FEES

Application Type	FILING FEES Fee ($)	FILING FEES Small Entity Fee ($)	SEARCH FEES Fee ($)	SEARCH FEES Small Entity Fee ($)	EXAMINATION FEES Fee ($)	EXAMINATION FEES Small Entity Fee ($)	Fees Paid ($)
Utility	300	150	500	250	200	100	0
Design	200	100	100	50	130	65	0
Plant	200	100	300	150	160	80	0
Reissue	300	150	500	250	600	300	0
Provisional	200	100	0	0	0	0	200

2. EXCESS CLAIM FEES

Fee Description	Fee ($)	Small Entity Fee ($)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee ($)	Fee Paid ($)
29 - 20 or HP =	0 x	50 =	0

HP = highest number of total claims paid for, if greater than 20

Indep. Claims	Extra Claims	Fee ($)	Fee Paid ($)
7 - 3 or HP =	0 x	200 =	0

HP = highest number of independent claims paid for, if greater than 3

Multiple Dependent Claims Fee ($)	Fee Paid ($)
360	

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee ($)	Fee Paid ($)
129 - 100 =	29 / 50 =	1 (round up to a whole number) x	250 =	250

4. OTHER FEE(S) Fees Paid ($)

Non-English Specification, $130 fee (no small entity discount) _____

Other: _____

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Application Data Sheet

Application Information

Filing Date::	09/16/05
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Subject Matter::	Utility
Computer Readable Form (CRF)?::	NO
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PROVISIONAL APPLICATION COVER SHEET
Additional Page

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Docket Number: MS314939.01 / MSFTP1182US

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Number 1 of 1

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Atty. Docket No. MS314939.01 / MSFTP1182US

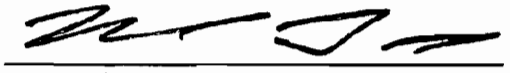
ENHANCED PORTABLE DEVICE NAVIGATION TOOLS

by

David Wayne Flynt, Bryan T. Agnetta, Eduardo L. Escardo-Raffo, Timothy James Benton, Sally Louise Barton, Vinoo Cherian, Dane M. Howard, Lee Chuan Lin, Hok-Sum Horace Luke and Peter G. Chin

MAIL CERTIFICATION

I hereby certify that the attached patent application (along with any other paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on this date September 16, 2005, in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number EV526570459US addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.



Himanshu S. Amin

Title: ENHANCED PORTABLE DEVICE NAVIGATION TOOLS

BACKGROUND

[0001] Portable devices have become increasingly popular and prevalent in today's society. Functions, features and capabilities have increased both the utility and complexity of portable devices. Portable devices can include cellular phone service, VoIP phone service, software applications, email access, Internet capabilities, music players and the like. It is likely that functions will continue to be added to mobile devices further increasing. Mobile or portable devices can include personal digital assistants (PDAs), text messengers, cellular phones, pocket personal computers, smartphones and the like.

[0002] While consumers desire additional functionality, the sheer volume of information and functions make it difficult to fully exploit the capabilities of such devices. The problem is exacerbated by the generally have limited user interfaces of mobile devices. Such devices are designed to be small and lightweight. Consequently, the devices generally have limited display screens and input devices. Due to the size of the user input devices and display screens, it may be difficult for users to enter information into and view information retrieved from mobile devices.

[0003] Due to the volume and variety of information that may be contained in or accessed by the user device, as well as the growing number of functions such devices are capable of supporting, users may have difficulty in finding the information or function they desire. In addition, the conventional menu structures for mobile devices require users to remember a hierarchy of functions or applications to reach the desired data or task. Users can become frustrated when they are unable to locate the desired information or tasks and may be unable to fully exploit the functions and advantages of the mobile device.

[0004] There is a need for methods or systems that enhance the usability of wireless communication devices. Moreover, there is a need for mobile devices, which provide users with easy access to data and tasks.

SUMMARY

[0005] The following presents a simplified summary in order to provide a basic understanding of some aspects of the claimed subject matter. This summary is

not an extensive overview. It is not intended to identify key/critical elements or to delineate the scope of the claimed subject matter. Its sole purpose is to present some concepts in a simplified form as a prelude to the more detailed description that is presented later.

[0006] Briefly described, the provided subject matter concerns systems and methods for intuitive controls for a portable device that facilitate information retrieval and functionality based upon data and task relationships. A set of tools is provided to allow users to navigate through content and tasks stored locally on the portable device as well as access to remote content. The tools provide users with a personalized, filtered view of content and tasks.

[0007] To the accomplishment of the foregoing and related ends, certain illustrative aspects of the claimed subject matter are described herein in connection with the following description and the annexed drawings. These aspects are indicative of various ways in which the subject matter may be practiced, all of which are intended to be within the scope of the claimed subject matter. Other advantages and novel features may become apparent from the following detailed description when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 illustrates portable device display screens of a portable device.

[0009] Fig. 2 illustrates a portable device display screen including a menu.

[0010] Fig. 3 illustrates display screens for a mobile device featuring context sensitive menus.

[0011] Fig. 4 illustrates display screens for a mobile device featuring context sensitive menus in the message application.

[0012] Fig. 5 illustrates mobile device display screens utilizing a context sensitive search function.

[0013] Fig. 6 illustrates a mobile device display screen having context sensitive softkeys.

[0014] Fig. 7 illustrates utilizing a pivot control to move through data types associated with a contact.

[0015] Fig. 8 illustrates mobile device display screens utilizing context sensitive hotlists.

[0016] Fig. 9 illustrates pivot controls.

[0017] Fig. 10 illustrates utilizing a pivot control to move through data types associated with a contact card.

[0018] Fig. 11 illustrates locations of a pivot control.

[0019] Fig. 12 illustrates a pivot control.

[0020] Fig. 13 illustrates list types.

[0021] Fig. 14 illustrates a series of display screens including a search application.

[0022] Fig. 15 illustrates a display screen with a search application.

[0023] Fig. 16 illustrates a pivot control indicating search results.

[0024] Fig. 17 illustrates a search results list including keywords.

[0025] Fig. 18 illustrates a portable device display screen.

[0026] Fig. 19 illustrates a default hotlist.

[0027] Fig. 20 illustrates a Today hotlist.

[0028] Fig. 21 illustrates an Important People Hotlist.

[0029] Fig. 22 illustrates a Top Tasks Hotlist.

[0030] Fig. 23 illustrates a Recent Messages Hotlist.

[0031] Fig. 24 illustrates a Recent Calls Hotlist.

[0032] Fig. 25 illustrates a Recent Programs Hotlist.

[0033] Fig. 26 illustrates a Recent Music Hotlist.

[0034] Fig. 27 illustrates a Recent Pictures Hotlist.

[0035] Fig. 28 illustrates an Operator Hotlist.

[0036] Fig. 29 illustrates a Settings list.

[0037] Fig. 30 illustrates vertically scrolling lists.

[0038] Fig. 31 illustrates horizontal lists.

[0039] Fig. 32 illustrates grids lists.

[0040] Fig. 33 illustrates list items with multiple cells or columns.

[0041] Fig. 34 illustrates a list with multiple item heights.

[0042] Fig. 35 illustrates list items with a mix of content types.

[0043] Fig. 36 illustrates a list with groupings.

[0044] Fig. 37 illustrates list styles.

[0045] Fig. 38 illustrates lists.

[0046] Fig. 39 illustrates a tile space on a top-level screen.

[0047] Fig. 40 illustrates a tile space on a top-level screen.

[0048] Fig. 41 illustrates a series of tiles.

[0049] Fig. 42 illustrates menu indicators.

[0050] Fig. 43 illustrates softkey configurations.

[0051] Fig. 44 illustrates softkey configurations.

[0052] Fig. 45 illustrates softkey configurations.

[0053] Fig. 46 illustrates a notification.

[0054] Fig. 47 illustrates a notification.

[0055] Fig. 48 illustrates a notification.

[0056] Fig. 49 illustrates a notification.

[0057] Fig. 50 illustrates a notification.

[0058] Fig. 51 illustrates a notification.

[0059] Fig. 52 illustrates a notification.

[0060] Fig. 53 illustrates a methodology for adjusting softkeys.

[0061] Fig. 54 is a schematic block diagram illustrating a suitable operating environment.

DETAILED DESCRIPTION

[0062] The various aspects of the subject invention are now described with reference to the annexed drawings, wherein like numerals refer to like or corresponding elements throughout. It should be understood, however, that the drawings and detailed description relating thereto are not intended to limit the claimed subject matter to the particular form disclosed. Rather, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the claimed subject matter.

[0063] As used herein, the terms "component," "system" and the like are intended to refer to a computer-related entity, either hardware, a combination of hardware and software, software, or software in execution. For example, a component may be, but is not limited to being, a process running on a processor, a processor, an object, an executable, a thread of execution, a program, and/or a computer. By way of illustration, both an application running on computer and the computer can be a component. One or more components may reside within a process

and/or thread of execution and a component may be localized on one computer and/or distributed between two or more computers.

[0064] The word "exemplary" is used herein to mean serving as an example, instance, or illustration. Any aspect or design described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over other aspects or designs. In addition, while the examples provided utilize the C# programming language, numerous alternative programming languages may be used.

[0065] Furthermore, the disclosed subject matter may be implemented as a system, method, apparatus, or article of manufacture using standard programming and/or engineering techniques to produce software, firmware, hardware, or any combination thereof to control a computer or processor based device to implement aspects detailed herein. The term "article of manufacture" (or alternatively, "computer program product") as used herein is intended to encompass a computer program accessible from any computer-readable device, carrier, or media. For example, computer readable media can include but are not limited to magnetic storage devices (*e.g.*, hard disk, floppy disk, magnetic strips...), optical disks (*e.g.*, compact disk (CD), digital versatile disk (DVD)...), smart cards, and flash memory devices (*e.g.*, card, stick). Additionally it should be appreciated that a carrier wave can be employed to carry computer-readable electronic data such as those used in transmitting and receiving electronic mail or in accessing a network such as the Internet or a local area network (LAN). Of course, those skilled in the art will recognize many modifications may be made to this configuration without departing from the scope or spirit of the claimed subject matter.

[0066] The present invention is applicable to the emerging class of mobile computing devices called *smartphones* as well as other types of portable devices including cell phones and PDAs. By way of example, several aspects of the invention will be discussed with relation to smartphones; however, it should be appreciated that the present invention can be applied to or used in conjunction with various other portable devices.

[0067] Smartphones combine the portability and network connectivity of cell phones with the computing power of PDAs. The color displays of smartphones are capable of animation and usually have resolutions in the range of 200 by 200 pixels. Many of these devices do not have touch screens and even those that do are often used

in one-handed situations. Most smartphones augment the numeric keypad with a four-way directional keypad (d-pad) or joystick. In addition there are several dedicated buttons (back, home, and action) and two "soft-keys" that can be arbitrarily assigned functionality by the current application.

I. SYSTEM OVERVIEW

[0068] The system and methods described herein relate to a mobile computing device or system, such as a smartphone, with enhanced usability. The mobile device system described can be implemented with a variety of hardware configurations. The system provides intuitive controls that facilitate information retrieval and functionality based upon data relationships and tasks as opposed to the conventional application-based hierarchy. This shift in focus from applications to data relationships and available tasks reflects users' interests and results in improved usability.

[0069] Content on mobile devices takes many forms, including contact information, calendar items, mail, music, photos, documents, and tasks. Access to content and available tasks for the content are typically provided only through applications specific to the content data type, generally the application used to create or render the specific content data type. For example, to read email from a contact, a user must navigate to the email application. To call that contact with a question about that mail, the user must navigate to the space where that contact's communication details are visible (*e.g.*, the contact card). Using an application to find information stored on the device can be difficult. For example, to view mail from a specific sender, the user must navigate to email and search by the sender's name.

[0070] In general, the system described is context sensitive. The displays, data, tasks, and controls are dynamic and updated based upon the current context or state of the mobile device. The context can include recent user actions, the data or task currently selected. Using context sensitivity, the mobile device is able to present the user with relevant data, tasks or controls, thereby mitigating the need to traverse a set of hierarchical menus. Context sensitivity as applied to specific controls (*e.g.*, menus, lists and the like) is described in detail below.

[0071] The mobile device can include a pivot control, also referred to as a pivot widget or PW) to facilitate navigation through content and tasks. The pivot control can be a global control that is populated with appropriate information based upon the context. The pivot control includes a loop containing pivot items. Users navigate through the loop using an input device such as a keypad, number pad, stylus or the like to move left or right. By continuing to move in the same direction, the user can cycle through all the available pivot items. One or more lists can be associated with the pivot items.

[0072] The pivot control can be used to sort a list of items, filter a list of items or switch to related data types of content. For example, when sorting a list of messages, the pivot items may allow the user to sort by date, sender, subject, category and the like. By moving left or right, the list is automatically sorted based upon the selected pivot item sort. Similarly, the pivot control can be used to apply a filter to a list of items. In addition, as described in detail below, the pivot control can allow users to move through lists of different data types.

[0073] The system can include a search function designed to facilitate retrieval of multiple data types as well as access points to information not stored on the mobile device. Typically, the search is incremental; as the user enters characters, a search against all matchable data types is performed using the combinations of characters and numbers. Because of the size constraints, the input device may be limited to a number pad. Therefore, the search function can match both the number entered at the keypad as well as associated characters. The search function can generate a list of data items that match the search parameters. The user interface for the search function can utilize the pivot control to provide access to search results of different data types. For example, a search within the contact context will produce a list of contacts matching the entered characters. Other data types can be represented as icons within the set of pivot items. The icons for data types with data that matches the search parameters can change state to indicate the presence of a match. Pivoting to alternate pivot items will display the list of items that match the search parameters. The default list presented during character entry can be determined based upon context.

[0074] In addition, the search function can support access to services and remote data access points by supporting a list of keywords. Each keyword can be

associated with either a service on the device or a remote data location. For example, the keyword "weather" can be associated with a local weather application, and the keyword "news" can be associated with a news feed application discovery and download. Keywords can serve as shortcuts to device tasks as well as help topics. For example, the keyword "ringtone" can provide users with a shortcut to the control to change the ringtone for the mobile device or a shortcut to the help topic explaining how to download ringtones.

[0075] The mobile device can also include a set of filtered lists, referred to herein as hotlists to facilitate navigation. The hotlists are a collection of filtered lists that allow users to quickly access tasks, content, settings and mobile device controls. The pivot control can be used to navigate through the set of hotlists. A single hotlist is a filtered list that can contain multiple types of data items. The mobile device can include a default set of hotlists, including a list of recent messages, favorite music and the like. For example, a "today" hotlist can include user information relevant to the schedule for the day (*e.g.*, appointments, task reminders, *etc.*). In addition, users may create personalized hotlists. The hotlists provide flexible, easy access to mobile device information and services.

[0076] The system can also include a personalized homespace that provides users with a consistent and personalized entry point. The user should be able to navigate to their homespace at the touch of a button. In addition, on start up, the mobile device should automatically enter the homespace. This provides users with a consistent starting point that can be personalized. In addition, the homespace should be populated with data and tasks relevant to the user.

[0077] The homespace can include a set of tiles. A tile is a graphical placeholder, which may include information. Tiles are presented as a grid with focus on one tile at a time. When a tile is in focus, the tile is expanded such that additional information is presented to the user. Users can select tiles to access tasks, data, online services or applications. The tile gridspace provides users with information at a glance and allows quick access to additional information or services. Tiles can be created by vendors or applications and users may add, delete or rearrange tiles.

[0078] The mobile device may also include softkeys and menus coordinated to optimize usability. The system should handle variations in hardware including variable numbers of softkeys. The operating system will maximize the use of the

available softkeys and coordinate with menus and ensure that functionality is not lost on a system with a limited number of softkeys.

II. CONTEXT SENSITIVITY

[0079] Use of context sensitivity greatly increases the usability of the mobile device system. The system is aware of relationships between data types and between data types and tasks and uses this knowledge to present users with relevant data and tasks based upon current context. The display, including data, tasks, and user controls are dynamically updated based upon the current context or state of the mobile device. Sensitivity to the current state of the mobile device can take many different forms. For example, softkeys and menus can be updated based upon the item that has focus, card views can be pivoted to provide access to related information and lists can be sorted based upon metadata.

[0080] Context sensitivity enables user-focused access to data and tasks as well as surfacing links between applications. In addition, context sensitivity recognizes and leverages the relationships between data items to improve access to information outside of the detail or card level. In practice, this means that focus on an item in a list or a card may provide dynamic affordances and access to related information. For example, a user can create a team contact populated with team members, email distributed to the team, meeting events, shared documents, *etc.* The user has effectively created a card for the team project that will provide the user with access to related tasks (*e.g.*, email, document view, calendar and the like). Similarly, the user could create a card for a calendar event that could include attendees, documents required, equipment required for the meeting.

[0081] Users need to easily find, consume and act on relevant information, perform core tasks and keep track of what's happening in their world. Context sensitivity provides core tasks outside of detail cards, such as contact cards and allows the user to quickly access new information without wading through multiple applications. Information related to people is available from contact cards. The search provides users with everything they need, but never gets in the way of performing the basic function of making a telephone call. However, all of the content

and tasks are still available through the applications, the system simply provides a tool for providing the most relevant content and tasks.

[0082] The system allows a user to perform tasks related to multiple data types from an application that is generally used to render a single data type. For example, a user reading an email can call the sender of the email, schedule a meeting with the sender, or perform other tasks without navigating to other applications. The system can associate multiple tasks with a data type, including tasks that were not included in the original application for the data type. For example, the tasks associated with music can be extended to include emailing the music. The system may tag content with information regarding its relationship or association with other content. Content items could also be tagged with information regarding relevant tasks for the item. Alternatively, tasks may be associated with items based upon the data type of the item. The tasks associated with any data type should be extensible. For example, for the contact data type the system has a set of tasks associated with contacts. However, if a vendor adds a new task (*e.g.*, instant messaging), the system can be updated either manually or automatically to utilize this new task in the same manner as existing tasks.

[0083] Additionally, this system provides access to multiple data types and multiple data sources through a single location (*e.g.*, the contact card). Thus, from within the single location, such as the contact card, a user can access all information related to that individual (*e.g.*, events, emails, documents, messages and pictures) without leaving the contact card. Similarly, when viewing a calendar item, such as a meeting, a user can access related documents, view email threads and contact meeting participants. For example, if a user needs to call a participant of a recent meeting from the calendar event the user can select the participant. The user can then select "call at work" from a menu to contact the participant. The context of the space is used to populate the affordances (*e.g.*, the menu) accessible in that space.

[0084] The system may provide access to remotely stored content as well as content stored locally, on the portable device. The system can utilize communication components (*e.g.*, Bluetooth, 802.11g, or any other suitable communication device) to download data as needed. The system may provide the user with access points to content rather than the content.

[0085] Fig. 2 illustrates a mobile device display screen 200 including a menu populated with tasks relevant to the item that has focus. In conventional systems, if a list item, such as a search result, had focus and the d-pad was pressed the item would be opened or drilled into. Here, the system provides a menu including tasks related to the item. Where the item with focus is a contact as illustrated in Fig. 2, the user is presented with a menu of options including viewing the contact information for that contact, sending the contact an email, sending a short message server (SMS) text message or calling the contact's mobile phone. Each of the tasks presented in the sample menu can be provided by different applications, but are relevant for the item that has focus.

[0086] The system may provide an access point to the contact card (*e.g.*, "View Contact") for a content item whenever the content item has a contact card as a recognizable property. This may be at both list and card level or only card level. In addition, whenever a content item has a contact as a recognizable property, a communication access point to that contact should be made available. A communication access point is a method of communicating with the contact (*e.g.*, email, mobile phone and text message). For example, in an email list, the reply menu can include "Call sender." This may be at both list and card level or only card level. Specific applications may roll up all context sensitive items into a cascade menu to preserve menu stability.

[0087] In general, the softkey tasks will also be present in menus. In addition, at least one softkey can be dynamic and based upon the item that has focus. However, the context sensitive softkey cannot provide the "open" task that is afforded by the action mechanism because of the potential for duplication since the softkey tasks are also present in the menus. "Open" may be a static softkey, as long as it does not vary based upon list focus.

[0088] The system can support access to context sensitive menus using either action and hold or tap and hold. Tap and hold consists of tapping a stylus or other input device and holding for a short period of time. Action and hold consists of pressing an action button and holding for a short period of time. Context sensitive menus contain specific tasks related to the item in focus and are comparable to the right click menu for operating systems such as Microsoft Windows XP. Like the right click menu, these context menus may apply to items in a list as well as highlighted

text. An animation can be used to indicate that the context sensitive menu is being accessed and to support discoverability.

[0089] Referring now to Fig. 3, display screens for a mobile device featuring context sensitive menus within the contacts application are illustrated. In a first display screen 300, the focus is on the pivot control in the contacts application. When focus is on the pivot control, the menu shown in display screen 302 should provide access to global items (*e.g.*, My People) as well as quick access to available pivots (*e.g.*, All, Recent and Work). When focus is on a specific contact in the display screen 304, the menu may display communication methods available for the specific contact (*e.g.*, "Send Email," "Send SMS" and "Call Mobile") as well as other global menu items as shown in the display screen 306.

[0090] Fig. 4 illustrates display screens for a mobile device featuring context sensitive menus in the message application. In a first display screen 400, focus is on the pivot control. As shown in the second display screen 402, the menu should provide access to global items as well as quick access to available pivots. With focus on a mail item, the menu may display available contact methods for the sender (*e.g.*, "Call Work" and "Send Email") as well as other context and global menu items (*e.g.*, "View Message," "Reply," "Forward" and "Delete"). With focus on a meeting request, the menu can display appropriate methods for acting on the item as well as other context and global menu items.

[0091] Fig. 5 illustrates mobile device display screens utilizing a context sensitive search function. The default search results list displayed when the search function is first engaged should be defined by context in which input began. For instance, if input is made from the Recent Music Hotlist, the default results list should be music. If no context can be assumed (dialing from the Home Screen) the default results list should be "People" as shown in the first display screen 500. A second display screen 502 includes the result list of keywords that match the search parameters. Users can switch between the search results lists using the pivot control. As illustrated in the figures, they number pad entry "2" can also match to the character "a". Consequently, the search result lists can include items that match to the characters as well as the number input. Below is a table listing the default search results based on context:

Search initiated in:	Default search results list:
Home	People
Today Hotlist	People
People Hotlist	People
Tasks Hotlist	People
Recent Messages Hotlist	Messages
Recent Music	Music
Recent Photos	Photos
Recent Applications	Apps
Operator Hotlist	People/Extensible
History Hotlist	People/Extensible
Contacts App	People
Messaging	Messages based on account in pivot?
Tasks	Tasks
pIE	URLs

[0092] Fig. 6 illustrates a mobile device display screen 600 having context sensitive softkeys. Context sensitivity enables softkeys to be more flexible and increase the visibility of available tasks. When two or more softkeys are available, the Left SoftKey (LSK) may display a context sensitive task, based on focus. In an application list, the list item in focus can generate the LSK. Context sensitivity in list views allows the LSK to dynamically change as appropriately defined by the application. For instance, in the contacts application, the LSK may be a default communication method that is context sensitive to the contact in focus. For example, if a contact has only an email as a contact method, then a dynamic softkey should display "Send Email" rather than "Call Home," as shown in the figure. Further, context sensitivity allows menus to dynamically change (where appropriate) to surface available tasks otherwise available only at the card level.

[0093] Referring now to Fig. 7, in card views (*e.g.*, contact card, read note, *etc.*) context sensitive behavior may be based on specific focus as well as a property of the card. For instance, in a message read note, focus on the sender may allow the RSK to display the default communication method. In a contact card, a pivot control can be populated with appropriate available data types.

[0094] Within a contact card, available data types will be selected using a pivot control. For example, a first display screen 700 includes address for the contact.

Pivoting to the left reveals the second display screen 702 including any notes associated with the contact. Pivoting to the left again would result in a third display screen 704 including a history of data or task related to the contact. Finally, pivoting to the left again reveals a fourth display screen 706 including the contact details. The pivot items can be dynamically populated for each contact, so as to only populate those types that match for that particular contact. For instance, if a particular contact has no related documents on the device, that document type will not appear as an available category in the pivot control.

[0095] Fig. 8 illustrates mobile device display screens 800, 802 and 804 utilizing context sensitive hotlists. A hotlist will provide relevant communication methods based upon context where possible. For example, if a list items has a contact property, the LSK may display relevant tasks based upon the context and a menu may be used to expose available communication methods for that contact. For example, a user wants to share a song he or she likes with a friend. From a hotlist of recent music, the user can begin to type the title of the song. The search function displays the results of a music search in the default list because the context indicates that music is the appropriate result list. The user is able to focus on the song and select a "share" task from a menu. The user should then be able to select her friend.

[0096] In addition, third party software applications may choose to recognize and make available content related to a contact. As a default, context sensitivity should allow applications to include appropriate content as outlined below using the pivot control control:

Contact card default data types include:

Type	**Match against**	**Sort pivot control list by**
Email	From and CC for all account types	most recent at top
Text Messages	Sender/phone #	most recent at top
MMS	Sender/Phone #	most recent at top
Call history	Phone #	most recent at top
Events	Organizer and Participant	Grouped by "Future" and "Past" with most recent at top of both groups. Open by default with Future group label first.
Tasks	Owner	Grouped by Status with most nearest due date at top

Docs/ppts/xls	author	alpha
Music	shared by	alpha
Photos	Shared by	Most recent, grouped if necessary
Extensible	App defined	App defined

Messaging cards default data types include:

Type	**Match against**	**Display in**
Sender communication methods	Sender name Sender email	Softkey (Sk) Menu
To line communication methods	"To" name "To" email	Sk Menu
Sender shared events	Sender name Sender email	Menu

Calendar card default data types include:

Type	**Match against**	**Display in (sort by)**
Organizer communication methods	Organizer name Organizer email	CS Menu Pivot control (recent)
Attendee comm. methods	Organizer name Organizer email	CS Menu Pivot control (recent)
Email with organizer	Organizer name Organizer email	Pivot control (Recent)
Docs/ppts/xls	author	Pivot control (alpha)
Extensible	App defined	App defined

[0097] The system can also include a titlebar that provide users with information regarding the current context and status of the device. The titlebar provides context for the displayed information and updates based upon the context. The titlebar allows users to identify the space they are viewing (*e.g.*, contacts, calendar, messages, *etc.*) as well as general status information about the device (*e.g.*, signal strength, battery strength, *etc.*). The titlebar can be scalable. The arrangement and presentation can be dynamic and the visual elements of the titlebar should be theme-aware. The users or vendor should be able to personalize the look of the titlebar using skins and the like.

III. PIVOT CONTROL

[0098] The pivot control is a global control that allows a user to quickly rearrange or change (*e.g.*, sort or filter) the content of a list. The list can exist as an application or be nested within a detail card. In addition, the pivot control acts as a view of the device. The pivot control is extensible and may be utilized by third party software applications. The pivot control should be available throughout the device. The pivot control allows users to find information on the mobile device, to use that information and to perform core device tasks. The user can quickly access people, places and things through filterable or sortable lists and can access information using methods that match the individual user's work style. For example, a user headed to a meeting wants to let the meeting organizer know that he or she is running late. From the event card for the meeting, the user can view the meeting details. By pivoting using the pivot control, the user is able to view a list of the meeting attendees. The menu can provide the user with a method of contacting the organizer. After calling the organizer, the user can pivot again to look at the agenda or other documents associated with the meeting event.

[0099] On screen, the pivot control can appear as a centered text label flanked on either side by icons or other text labels. The text and/or icon labels represent pivot items. Between the center label and the side icons/labels are arrows pointing outward. The pivot control functions as a loop and should have at least three possible options.

[00100] Referring now to Fig. 9, examples of pivot controls are illustrated. A first pivot control 900 uses text pivot items. The second pivot control 902 uses icon pivot items. The pivot control graphics can indicate whether the pivot control has focus. Text or icon labels for pivot items are dynamic and updated based upon context. In addition, users can modify pivot item labels. The arrows and text/icon labels can act as buttons, allowing the user to move through the pivot control. The pivot control can include animations and transitions that indicate movement through the pivot items in the pivot control. In addition, the pivot item labels may indicate the number of entries in the list associated with the pivot item. Pivot control can also reflect the down states. The pivot control can also indicate when it has focus. In Fig. 9, pivot control 900 has focus, pivot control 902 does not.

[00101] The pivot control can be a fixed height or can be resizable with a minimum height. The pivot control can be distinguished by a visual treatment that at includes a center label, left and right facing arrows, and/or (depending on the location) icons or left and right Labels. The left and right Labels may be truncated, as illustrated in pivot control 902 or alpha blended. The center label should also be able to indicate the number of items in the list and can include an icon, as shown in pivot control 900. Alternatively, the center label can consist of an icon. In general, the pivot control can reflect the global device settings (*e.g.*, font size, theme and the like). However, applications may be allowed to customize content and rendering (*e.g.*, text labels, graphics and animations).

[00102] In practice, the user can interact with the pivot control using a left/right (L/R) input device or hardware controller or by tapping the control with a stylus or similar device. Upon receiving the command to pivot, the center label will "move" opposite to the direction of the hardware input and replace the label on that side. The label corresponding to the side of the direction indicated by the hardware controller will move to the center position. A new label will be rendered on the side indicated by the hardware controller. Thus, pivot item lists will appear to move into the center from the direction of the hardware press. By continuing to press the same direction of the controller, the user can cycle through all the available pivots items.

[00103] Referring now to Fig. 10, a user moves through display screens 1000, 1002, 1004 and 1006. If the user viewing the contact card shown in display screen 3200 presses a right d-pad key, the "Communication" label will move to the left and replace the "My Day" label. The "Addresses" label will move to the center position as can be seen in display screen 1002. Depressing the right d-pad key again will move the "My Space" label into the center position as illustrated in display screen 1004. If only three sorts are available, the "My Day" label replaces "Addresses." If the user continues to press the right d-pad key, the pivot control will loop until the "Communication label" appears in the right position, as illustrated in display screen 1006. Pressing the right d-pad key once more would move the "Communication" label back to the center, returning to the first display screen 1000.

[00104] Referring now to Fig. 11, the on screen pivot control can generally appear near the top of a list view for hotlists, application list view, pickers, *etc.* A first display screen 1100 illustrates a pivot control with a hotlist. The second display

screen 1102 shows a pivot control in an application list. The third display screen 1104 illustrates a pivot control in a detail card. The pivot control can be shown below the list title and below the header of a detail card. The on-screen pivot control can appear directly above the list that it is meant to control.

[00105] In general, the pivot control will be in focus by default upon entry to a list or card that uses the pivot control. This will support use of the pivot control as the first act by the user. There may be special cases (*e.g.*, the HotList) where default focus is on the first item in the list. However, this has list design and interaction implications, discussed in detail below and should be done with care to maintain the best user experience.

[00106] Referring now to Fig.12, when the pivot control is in focus, the background of the center label will be highlighted and the center text label will be a contrasting color as illustrated in the detail of a display screen 1200. When the pivot control does not have focus, the center label will maintain a visual treatment to distinguish it from the side labels, as illustrated in the detail of display screen 1202. When using the hardware Left/Right to select an option to either side of the center label, the option on the indicated side will be temporarily indicated, as illustrated in the detail of the display screen 1204. Here the side label and arrow are a contrasting color. This is equivalent to the downstate of the side label if tapped using a touchscreen device. Once the center label has been replaced with the label from the indicated side, the temporary side highlight will disappear. When the pivot control is used to move through the pivot items the labels will animate. For example, the side label indicated will appear to move towards the center label.

[00107] The pivot control may perform a filter action on a list (display a subset of items) or a sort (display all items based on an application driven criteria). A pivot control must have at least three options, but it may be used whenever there are at least two unique filters or sorts, provided that the third option is "All" (for filters) or "Alphabetically" (for sorts). For example, a user may want to listen to jazz music. The user can open up "My Music" and then pivot to filter the music by genres. The user can then select a playlist under the "Jazz" genre.

[00108] When the pivot control is used to sort lists, the control allows a user to rearrange a list to allow the user to more easily consume information. The "My Music" list, for instance, might allow a user to view their music by Album, Artist,

Genre, etc. The "Contacts" List might allow a person to view people by company, group, or presence state.

[00109] When the pivot control is used as a filter, an application like Messaging might allow the user to see mail by type – Work Email, SMS, etc. A Calendar event card might allow users to see content related to the event (*e.g.*, attendees, map, agenda, documents, *etc.*). When used as a filter, the control will have an "all" or unfiltered state. This may be the default state of the list. The state of the filter may be reset on timeout or may be sticky.

[00110] The action of filtering/sorting generated by the pivot control may be combined with another sort or filter enabled through a menu or some other affordance. For example, a music application may use the pivot control to enable sorting by Album, Artist, genre, etc and then use a menu function to allow the user to filter the results of the sort. In this case, a user may pivot to see their music by Album and then place a "Rock" filter on the list using the menu. Similarly, a user may wish to sort their messages by account type and then wish to further filter that list by "Teammates." When a filter is applied by means other than the pivot control, the list title will update to indicate the content filter.

[00111] The pivot control can be accessed by both hardware and software. In general, a list will be pivoted (filtered/sorted) when a user makes a left or right action on their hardware control or when a user taps on the left or right side of the on-screen pivot control. If the user continues to select the same direction, the labels will cycle back to their starting positions.

[00112] When using hardware to adjust the pivot of a list, a user can either hit the left or right key of their hardware navigational control (*e.g.*, a 5-way navigational control). The pivot control can include several special cases. For example, for hotlists the on-screen pivot control does not require focus to be adjusted in the hot-lists space. A user can hit left or right at any time to adjust the pivot in this space, even if focus is on a particular item in the list, rather than on the pivot control.

[00113] Referring now to Fig.13, for vertically oriented lists, as illustrated in the first display screen 1300, the on-screen filter widget does not require focus to be adjusted. In that case, a user can hit left or right at any time to adjust the pivot in this space. However, an application may choose to require focus for the pivot to work

[00114] The on-screen pivot control requires focus to adjust the pivot of a list that is arranged horizontally, as in the case of a carousel as illustrated in display screen 1302. Consequently, to adjust the pivot of a horizontally oriented list view while navigating the list, users must first move focus to the on-screen pivot control, then use the left or right control to change the view of the list.

[00115] Grid views 1304 behave similar to horizontal lists. The on-screen pivot control requires focus to adjust the pivot of a list that is arranged in a grid. Consequently, to adjust the pivot of a grid list view from within the grid, users must first navigate through the grid until the pivot control is in focus, then use the left or right control to change the view of the list.

[00116] The list type driven by the pivot control may change as appropriate for the content type. For instance, when used in a Contact card the pivot control may allow the user to choose between communication methods and pictures. The "Communication" list may render as a vertical list while the "Pictures" list may render as a grid. In the case where mixed list types are used, the PW always requires focus to change.

[00117] When a stylus, finger or other device is used for a touch screen enabled device, hitting the left and right region in most areas of the pivot control will adjust the view of the list. The pivot control arrows will display a down state on depress that will automatically return to the unpressed state after the label has updated. The may sort as soon as the navigation portion of the pivot control is touched. Alternatively, the first touch can place focus on the pivot control and a second touch or tap can initiate pivoting.

[00118] The system can provide a default category to be displayed by the on-screen pivot control. This default may be reset by the application, and/or the application may allow the user to customize this default category. If the pivot control acts as a filter to the list, the default filter can be to show all items in the list (*e.g.*, "All Items"). If the pivot control acts to sort the list, the default sort can be the first filter entered into the sort database, which should be the most frequently used sort (*e.g.*, alphabetical for Contacts). Since the sort function simply reorganizes the list and each list type has different categories that determine how the list items can be organized, individual applications should determine the sort categories, the order of

these categories and the default sort. During use of the pivot control to sort or filter lists, the option selected by the user may be sticky or reset on timeout.

[00119] The pivot control should be a global control. Therefore, applications should be able to customize the pivot control. Applications should choose the filter or sorts that populate the pivot control. The applications should also decide to change the default category as needed. Applications can also allow users to customize the categories. The system may require an "All Items" category when the pivot control is used as a filter. The presence of the "All Items" categories allows the user to undo any filters applied to the list.

[00120] In a further example, a user has free time and wants to read their personal email. From the user's inbox, he or she can pivot to the right to select "Hotmail." The Hotmail list includes all messages in their Hotmail account. In another example, a user wants to share a picture on their device with a friend. The user begins to type the date the picture was taken. The search function appears with a list of people and data. The user can pivot to the right until the "Picture" list is selected. The user can then select the appropriate picture from the list and send it.

[00121] The pivot controls should indicate that it is a left/right operating component. The pivot control can limit the maximum number of pivot items to maintain a manageable pivot size. The pivot control can be visually associated with a fixed variable" (*e.g.* a list type label, contact header, calendar event title or the like). Timeouts may be used to reset the lists where appropriate. The pivot control can indicate alternative states, although it need not indicate all states. The pivot control can easily localize without compromising usability. In addition, the pivot control can indicate the current state of the list through the widget as well as leveraging hardware left/right/ to quickly adjust the settings.

IV. SEARCH APPLICATION

[00122] The search application provides a way to quickly access local device data of all recognized types as well as keywords that map to applications, tasks and remote services. The search application searches for all known data types stored on the device as well as keywords for access to remote content. Therefore, to find a specific email message, a user can enter known words in the subject. To find music

stored on the device, the user can enter the artist and see a list of all music by that artist stored locally. To find information not on the device, like the weather, the user might enter "Weather."

[00123] The search application appears automatically when users begin to input characters. When a user enters characters using an input mechanism (*e.g.*, Numpad, QWERTY keyboard, SIP, etc) the search application will overlay the current user interface (UI) screen. Default focus will be in the accumulator. As characters/numbers are entered, a search against all matchable data types (*e.g.*, call history, messages, contacts, calendar events, music, pictures, Word documents, keywords, *etc.*) is performed using the combinations of characters/numbers. The file names of data that match the input will be displayed in the list below the pivot widget. Matching characters are indicated in filenames displayed in the list. In addition, users can enter search input in any manner, including voice input, handwriting, stylus, *etc.*) The search application can abstract the input mechanism to provide search results for the input data.

[00124] Content matching the input can be determined in a variety of ways. The search application may match the input to filenames, file content, metadata associated with the content, tags associated with the content, pattern recognition and any other suitable method of matching input to content. In addition, the search application may be trained based upon user preferences. The search application may utilize user feedback to improve the search process. User feedback may be either explicit (*e.g.*, user ranking of results) or implicit (*e.g.*, based on user selections from the result list).

[00125] Numerous strategies may be utilized to limit the search results to avoid overwhelming the user. First, the pivot control automatically separates the results by category, thereby limiting the results visible to the user to the categories the user elects to view. In addition, the number of search results in one or more categories can be limited. For example, the search application may initially return the top ten results. The search application could also downweight certain categories based upon the context. Alternatively, the user could select certain categories to search. The search application may also be trained according to the individual user's preferences.

[00126] If a limited input mechanism, such as a number pad, is used for input, the search application will expand the input. For example, for conventional telephone

number pads the "2" button also represents "A", "B" and "C." Consequently, when a number keypad is used as the input mechanism the search application will perform the search using the associated characters as well as the numeric value. In addition, the search application may perform the same expansion of input for international data. The number pad "3" may match characters in a multitude of languages and the search application should utilize the relevant characters.

[00127] Matches in data types other than that represented in the default list will be indicated by icons in the pivot widget. These icons will changes state to indicate a match. As matches are eliminated based upon continued character entry, the icon will revert to the non-matched state.

[00128] The system may utilize multiple data configurations to support context sensitivity, the search application, *etc.* The data may be stored as one pool of data with associated tags. Alternatively, content can be stored in separate data stores. The system may include an additional data store that includes all current pivot control categories.

[00129] When dialing from the Home screen, the default data type displayed is "Contacts." This will include Call History records, although only single entries will appear for each individual listed. In other words, multiple calls to or from the same individual will display as a single entry, with the most recent call represented (last used number).

[00130] When dialing from within a hotlist or another application, the matching data type may be set as the default list. For example, if a user switches to the Music hotlist and enters characters, the center label will indicate matches against music formats.

[00131] By moving focus to the pivot widget and pivoting left or right, the user can see lists with other matches. For instance, a user may wish to play a song by Moby, by entering "MOB" brings up a list of songs on the device. In addition, the user can pivot to a link to download new music by Moby. If no match of local data exists, the list may contain a link to remote data. For example, a user may need to call a person within their company, but may not remember the person's number is stored in the device. The user can type the name. If the number is not stored in the device, the user can use a link to find the person's number in the company's directory. Placing focus on a match will provide access to appropriate tasks.

[00132] Referring now to Fig.14, a series of display screens including the search application are illustrated. In a first display screen 1400, the initial entry of "2" on a number pad matches against "People" whose names begin with "A," "B" or "C." In addition, the display screen 1400 indicates there are additional matches in other data types by highlighting the pivot icons for those data types. Here, the data types with matches are indicated in red. A second display screen 1402 reduces the matches to a single name and eliminates matches in other data types as well. The third display screen 1404, results in no matches within the list of "People." The search application provides a link to search remotely. By pivoting, the user can move to another data type as shown on a fourth display screen 1406. Here, the list of keywords is displayed after pivoting.

[00133] Fig. 15 illustrates a display screen 1500 with a search application. The search application display can include an accumulator 1502, a list label 1504 and/or a list label graphic, a pivot widget with icons 1506, a search results list 1508, and softkeys 1510. The default list label will be context sensitive. The list may feature icons to indicate a format. For example, the search application can differentiate call history items from contacts using icons.

[00134] Additional list types should be supported in the search application. At a minimum, the search application should support a grid list. Lists may also use groups to categorize matches within type. For instance, a match under media may be grouped under Music, Video, etc.

[00135] The search application experience will allow users to find data of several recognized types local to their device. The local data types surfaced by search application will include:

Media (All supported WMP types)	Images • .jpg • .gif • .bmp Music • wav • .mp3 • .mpa • playlists Video • Mpeg
PIM	Calendar events Email

	tasks
Powerpoint	.ppt
Excell	.xls
Documents	.doc
People	
Remote Keywords	
Device Keywords	

[00136] These data types will be represented in the search application space by icons in the pivot control. Each recognized type can have a data icon for the pivot control.

[00137] As the user enters characters into the accumulator, the icons for data types with matches will change state. As the match is eliminated, the state will revert to the non-match state. Alternately, a match may be indicated by populating the pivot control with icons that contain matches.

[00138] The list of search results can support icons to differentiate the file types. The following types can have icons:

Media (All supported WMP types)	Images • .jpg • .gif • .bmp Music • wav • .mp3 • .mpa • playlists Video • Mpeg
PIM	Calendar events Email tasks
Powerpoint	.ppt
Excell	.xls
Documents	.doc
People	Incoming Call Outgoing Call

	SIM Contact Device Contact
Remote Keywords	
Device Keywords	

[00139] The keywords category will list access to services and remote spaces. These may be pre-populated urls in the pIE favorites database. In addition, advertisers may purchase the rights to certain keywords on the mobile device. For example, the keyword "Movie" could link to a web application that shows the access point for the movie theater's website. As the user types in the word "Movie" the application for the advertiser can go fetch data regarding local movie times from a website. The search application may surface the advertiser's keyword if similar or related words are typed. It is important that such results do not detract from the main goal of improved usability.

[00140] The following keywords can be supported:

Keywords	**Links to**
music (my)	my music place
music (downloads)	music services
music (playlists)	my music playlists
music (my DJ)	my personal DJ
traffic (local)	local traffic app
glance (setup)	glance view setup
Share (photos)	photo stories
photos (share)	photo stories
photos (from friends)	photo sharing service
photos (view)	photo viewer
Slideshow	photo viewer
maps	mapping software discovery
Directions	mapping software discovery
location	mapping software discovery
find (me)	mapping software discovery
gps	mapping software discovery
shop (around me)	mapping software discovery
shop (groceries)	vons club app discovery
shop (apps)	Marketplace
marketplace	Marketplace
search	go to search
upgrade	About screen
balance (bank)	bank balance app

money (market)	stock market app
stocks	stock market app
market (stock)	stock market app
mutual funds	stock market app
PC (my)	browse my PC app discovery
my (PC)	browse my PC app discovery
my photos	photo viewer
911 (VIP)	emergency contacts
911 (emergency alerts)	emergency alert services
games	games category in apps catalog
recommended (services)	recommended category in apps catalog
local (guide)	local guide application
weather (local)	local weather app
local (weather)	local weather app
today's (weather)	local weather app
today (schedule)	today's calendar view
fun (downloads)	fun downloads (from apps catalog)
fun (comics)	comic app discovery & config
parking (meter)	parking meter app
parking (cheap)	mapping software discovery
snow (report)	local snow/ski conditions
ski (report)	local snow/ski conditions
road (report)	local traffic app
news	news feed app discovery & download
news (local)	news feed app discovery & download
Movie (times)	local movie times around me app
Sports (scores)	sport scores app & configuration
horoscopes	horoscopes app & configuration
google	google search field
google SMS	google sms service
Netflix	netflix video service app
shipping	fed ex tracking app
fedex	fed ex tracking app
tracking (package)	fed ex tracking app
package (tracking)	fed ex tracking app
clocks (download)	clock app chooser
time (faces)	clock app chooser
restaurants (local)	local restaurant app guide

local (restaurants)	local restaurant app guide
happy hour	local happy hour app
gas (cheap)	cheapest gas app

[00141] Fig. 17 illustrates a search results list including keywords. Keywords may be grouped by category. The search application can support keywords that serve as shortcuts to device tasks as well as help topics. The following device keywords will be supported:

keyword	**links to:**
MSN	Pocket MSN splash
MSN Messenger	Messenger sign-in
MSN Search	search
MSN 9paces	MSN Spaces
IM	Messenger sign-in
Chat	Messenger sign-in
Instant Messenger	Messenger sign-in
Text	Text Messaging
chat (setup)	3rd party chat setup wizard
SMS	Messenger sign-in
SMS (setup)	3rd party chat setup wizard
Buddies (messenger)	Messenger sign-in
buddies (near me)	buddie finder app
Media	Media Player
Video	video playlists
outlook	oultlook e-mail box
outbox	e-mail outbox
mail	Messaging
mail (setup)	mail configuration help
hot	Hot mail splash
sync	active sync splash
active	active sync splash
browse	PIE splash
PIE	PIE splash
favorites	My Favorites
my windows Mobile sync	sign into my windows mobile page
ringtones (change)	sound settings
ringtones (find)	apps catalog (tones, latest)
tones (find)	apps catalog (tones, latest)
tones (change)	sound settings
profiles	profile settings

clock	clock & alarm settings
battery	Power management settings
language	Regional settings
about this phone	About settings
call Barring	Call barring setting
call forwarding	call forwarding setting
call waiting	call waiting setting
caller ID	caller ID setting
ID (caller)	caller ID setting
connection (settings)	Connection settings
settings	Device settings
tomorrow	Go to tomorrow
Monday (next)	Go to (relatively) next Monday
Tuesday (next)	Go to (relative) next Tuesday
Wednesday (next)	Go to (relative) next Wednesday
Thursday (next)	Go to (relative) next Thursday
Friday (next)	Go to (relative) next Friday
Saturday (next)	Go to (relative) next Saturday
Sunday (next)	Go to (relative) next Sunday
Appointment (new)	create a new appointment for today
Tasks	Go to tasks
611 (about phone)	about this phone
611 (tutorial)	client
Help	Smart Phone How To
Help (mail setup)	quickstart guide

[00142] The default list presented by the search application during character entry can be set depending upon context. For example, when character entry begins in the Homescreen, the default results list should be set to "People" in order to optimize communication functions in the device. However, when character entry is performed from other locations (*e.g.*, Contacts, Music, messaging, *etc.*), the search application default list may be set to match the appropriate content type suggested by the location. For example, if a user enters characters while in the Hotlist of "Recent Music", the default list may be changed from People to Music.

[00143] When a list is filtered until it is empty, appropriate links may be inserted to aid discovery of opportunities to find information not located on the device. The following list indicates "No Match" links for the default data types:

List	No Match Link
People	Find Online
Images	Photo sharing service

Music	Download Music
Docs	Remote Desktop Browsing
Excell	Remote Desktop Browsing
Powerpoint	Remote Desktop Browsing
Device Keywords	Help (How To)
Remote keywords	pIE (search internet with the entered text as entry, spin to get selected word from the possible matches)

[00144] The search application will interact with hardware according to the following table:

Focus on:	**Hardware interaction result**
Accumulator	LSK = Call RSK = Save Back = remove last entered character
People	Call History Item • Send = Dial last number used • End = close search application (back to last screen) • Action=menu • LSk = Call • RSK = View • Back = move focus back to accumulator, clear last character in accumulator Contact • Send = call progress with default number populated • Action = menu • LSK = Default Communication action • RSK = View • Back = move focus back to accumulator •
Images	Send = nothing End = close search application (back to last screen) Action=menu LSk = Share RSK = View Back = move focus back to accumulator, clear last character in accumulator
Music	Send = nothing End = close search application (back to last screen) Action=menu LSk = Share RSK = Play Back = move focus back to accumulator, clear last character in accumulator
Documents	Send = nothing End = close search application (back to last screen) Action=menu

	LSk = Share RSK = View Back = move focus back to accumulator, clear last character in accumulator
PPT	Send = nothing End = close search application (back to last screen) Action=menu LSk = Share RSK = View Back = move focus back to accumulator, clear last character in accumulator
Excel	Send = nothing End = close search application (back to last screen) Action=menu LSk = Share RSK = View Back = move focus back to accumulator, clear last character in accumulator
Remote Keywords	Send = nothing End = close search application (back to last screen) Action=menu LSk = Share RSK = Go Back = move focus back to accumulator, clear last character in accumulator
Device Keywords	Send = nothing End = close search application (back to last screen) Action=menu LSk = Share RSK = Go Back = move focus back to accumulator, clear last character in accumulator

V. HOTLISTS

[00145] Referring now to Fig. 18, the system can include a group of lists, referred to herein as hotlists, to cull content and tasks from applications and settings controls and expose access to this content at a high level of the system user interface. The hotlists allow users to access information and tasks outside of the applications. The system can also provide an extensible mechanism for users and third parties to create and populate their own hotlists to make specific content more visible and

accessible. Using hotlists limits the need of users to navigate to individual applications.

[00146] A hotlist is a vertical or horizontally scrolling, brand-able space that provides access to content in an application-less environment. This content is a lightweight subset or filter of a larger set. A set of these lists provides the main access point to all device content. The user can interact with these lists using a control (*e.g.*, the pivot control) that enables Hardware L/R to cycle through the available lists. Because HotLists filter content, the length of a list may be capped by various methods (*e.g.*, most recent, favorite, most frequent, etc). The user can have access to additional data of the type represented in the Hotlist via a softkey or menu item. Although the hotlist is a filtered list showing the user's preferences, all data is still accessible through detail cards. For example, a contact card can include the call history for that person, as well as calendar events or any other content related to that person. All of this content may be accessed from the contact card, rather than by accessing each application individually.

[00147] In general, hotlist should be vertically scrolling lists, rather than grid or horizontally scrolling lists. However, the lists can be rendered in multiple ways. For example, the "Important People" list may be rendered as a vertically scrolling filmstrip.

[00148] The user or independent software vendors can create custom Hotlists. Hotlists are the core access point to all data on the device. As such, it is critical that operators and ISVs be able to create their own Hotlists that support their applications. To do so, the user can select the "New" task from the Hotlist Settings menu. They can then choose a type of hotlist from a list of available types. As a default, the system will support Hotlists of the following data types: contacts, images, music, messages, programs, URLs and settings. Software vendors can create custom list types.

[00149] A hotlist may be populated in two ways: from the list or from an application. In an existing Hotlist, a user can select "Add to hotlist" from the menu. This will launch a picker that displays data of the type that matches the list type. In an application with focus on an item, selecting "Add to Hotlist" from the menu will display a list of available Hotlists that match the data type in focus. For instance, if

user places focus on a song and selects "Add to Hotlist," only a Hotlist that can display music will be selectable.

[00150] In addition, hotlists may be populated using information retrieved from another portable device. For example, if a user switches to a new portable device using the system, he or she can import data from his or her previous portable device to populate the hotlists. In particular, call history from the previous portable device could be used to populate the recent calls hotlist. Users may be able to create and share hotlists. Popular hotlists could be published to and downloaded from networks (*e.g.*, the Internet). Hotlists may be implemented using any suitable schema, including an XML framework or any combination thereof.

[00151] A user can have any number of Hotlists. The number of lists viewable at any one time and ordering can be set using controls. When accessing the Hotlist Setting, the user will see a list of all the available Hotlists and then use a check box to indicate those to display. The user can also determine the order of the lists. The Hotlist Settings will be accessed from Settings, the Top Tasks Hotlist, and the "Add to Hotlist" menu item.

[00152] The content of Hotlists can be limited by either a most recently used (MRU) or most frequently used (MFU) mechanism or by requiring users to manually populate the lists. To populate an existing Hotlist the user will select the "Add to hotlist" menu item as described above. In general, items should not be manually added by the user to a list that uses an MRU or MFU to automatically populate that list. In addition, hotlists can be automatically created by the portable device. In particular, content may be tagged and added to a hotlist based upon metadata and/or tags. For example, the user could create a hotlist for a particular project at work. Any meetings, email, documents, etc. tagged as related to that project could be automatically added to the project hotlist.

[00153] The user can navigate Hotlists using the pivot control. This will allow left/right hardware or stylus interaction. When pivoting a Hotlist, the list can animate to show the pivot action. In a Hotlist, default focus will be on the first item in the list rather than on the pivot control. Because only vertically scrolling lists are to be used in a Hotlist, focus on the pivot control is not required to pivot the list. Therefore, pivot control will not take focus in the Hotlist. Although, the hotlist should obey any

general rules for wrapping. However, focus will not jump to the pivot control upon wrapping.

[00154] Hotlists can be distinguished from application lists by distinctive graphic elements in the background of the list. The graphic may be an image or a code drawn element. The same background image can be used for all Hotlists. The default graphic element may be replaced by the user or Operator using a Hotlist Setting. The Hotlist will support customization through theming and skinning. The theme applied should affect all graphic elements of the device consistently.

[00155] A default set of Hotlists provides coverage of the core content of a mobile device. Additionally, the Hotlist structure will be extensible so that users and third parties may craft and populate their own Hotlists. A mechanism is provided to allow users to select which hotlists they always wish to be able to view.

[00156] Both the content of the hotlists and the set of hotlists can be dynamic. Users can establish profiles that control the state of the portable device. In particular, a profile may define which hotlists are visible based upon time of day, day of the week, location of the portable device or any other suitable indicator of context. For example, between 8am and 5pm, the profile can ensure that the hotlists reflect work information, such as hotlists specific to certain work projects (*e.g.*, meetings, documents, team members, tasks related to the project, etc.) After 5pm or on weekends, the profile may define an alternate set of hotlists, such as entertainment, home finances, *etc*. In addition, many portable devices include global positioning systems (GPS). The profile may update based upon location rather than time of day.

[00157] In addition, the hotlist content can be dynamic. For example, the project hotlist discussed above can include a meeting event and access points for all of the meeting attendees. The list of attendees in the project hotlist can update as people are added to or dropped from the meeting. This also provides a way for vendors and service providers to provide information to users without interrupting users. For example, users may have a hotlist "Great Deals." This hotlist can be updated using data pushed from a network, such as the Internet. The hotlist may indicate when it is updated, but the user would only need to see the advertisements if he or she chooses to view the hotlist. In addition, the content pushed to the portable device may be dependent upon location. For example, based upon GPS it may be determined that the user and the portable device are near a particular store. Based upon proximity to

the store, advertisements for that store may be pushed to the portable device. In addition, the system could create hotlists dynamically depend upon context. For example, when the system context could identify when you enter into a restaurant, based upon GPS or a dinner meeting in the calendar. In this context, the system could dynamically create a hotlist populated with tasks and content used at similar meetings in the past (*e.g.*, tip calculator, credit card information, money manager application, coupons). Similarly, if the user is driving near the mall, the system could utilize the mall WiFi to pull information regarding the stores located in the mall and other mall related information (*e.g.*, list of recent purchases, wishlist, etc.). In a further example, the user could subscribe to certain hotlist. A hotlist "what's new" could pull data regarding events and news within a five-mile radius of the user's home (*e.g.*, restaurant reviews, movie times, movie reviews and the like). The system device could filter the data, for example, the user may want data only on action movies.

[00158] Referring now to Fig. 19, the default hotlists can include: Today, Important People, top Tasks, Recent Messages, Recent Calls, Recent Programs, Recent Music, Recent Pictures and Operator Hotlist. The Today list can be a glance-able, extensible list of relevant information about schedule. The Important People list can be a list of "pinned" or flagged contacts that provides quick access to communication methods, presence status, and details. Top Tasks can be a list of frequently performed device tasks like "Change Ringtone." This list can be customized. Recent Messages can be a consolidated inbox list of all incoming communication attempts, sorted latest to earliest. It contains email, SMS, MMS, IM chat requests, voicemail, etc. Recent calls can be a coalesced list of incoming and outgoing calls. This list is a subset of Call History and will only show individuals once, even if multiple calls were made to or from the individuals. The list position of individuals can be determined by their most recent call. Recent Programs can be a list of the most recent or most frequent applications. Recent Music can include a list of recent music played. Recent Pictures can be a list of the last pictures viewed. The Operator Hotlist can be a placeholder for an operator to surface services or applications. The default hotlist in the center position can be the Today list. The user will be able to manage the number of Hotlists visible, their order, and in some cases the content of those lists. The default list can be ordered as follows:

C-4 Recent Music	C-3 Operator Hotlist	C-2 Recent Applications	C-1 Top Tasks	Center Hotlist Today	C+1 Important People	C+2 Recent Messages	C+3 Recent Calls	C+4 Recent Photos

[00159] Referring now to Fig. 20, the Today Hotlist will provide glance-able information and may be provide calendar information. The Today Hotlist will be the default list, visible whenever a user launches Hotlists. When softkeys are used with the Today hotlist, they will behave as follows:

SoftKey Number	Left SoftKey	Center Softkey	Right Softkey
1		Menu Icon	
2	Dynamic on Focus		New (light wizard)
3	Dynamic on Focus	Menu Icon	New (light wizard)

[00160] Menu items will include the following:

	Menu Items: 1. Action default 2. Settings 3. Hotlist 2 4. Hotlist 3 5. Hotlist 4 6. Hotlist 5 7. hotlist 6 8. Hotlist 7 9. Hotlist 8 10. Hotlist 9

[00161] Referring now to Fig. 21, the Important People Hotlist will display a list of contacts flagged or pinned by the user. The list may appear as a filmstrip. The People hotlist allows rapid communication and access to information about the contact. Out of the box, this may display the Operator Support number or the Voice mail number. The List may be populated by the user in the Contacts application or from the Hotlist using the Add feature in the menu. When softkeys are used with the Important People hotlist, they will behave as follows:

SoftKey Number	Left SoftKey	Center Softkey	Right Softkey
1		Menu Icon	
2	Dynamic on Focus – Default contact method		More – Navigate to Contacts application
3	Dynamic on Focus – Default contact method	Menu Icon	More – Navigate to Contacts application

[00162] Menu items will include the following:

	Menu Items: 1. Action default 2. Settings 3. Add to Hotlist 4. Remove from Hotlist 5. Dynamic Communication Method 1

	6. Dynamic Communication Method 2 7. Dynamic Communication Method 3 8.

[00163] Referring now to Fig. 22, the Top Tasks Hotlist will surface commonly used device settings, tools and control panels and may be customized by MOs and users to provide access to commonly performed tasks. Finding and changing device settings are among the most complex tasks for users to accomplish on portable devices. A specific set of device settings will be populated by default in the Top Tasks Hotlist. Other settings will be available from this list by selecting "More." The default content of the Top Tasks Hotlist can include the following tasks:

Task name	**Performs**
Change Ringtone	Links to Ringtones CPL
Lock Device Screen (SP Keylock, touch screen lock)	Turns on screenlock
Set ring profile	Links to profile chooser
Personalize my device	Links to Theme CPL
Change Hotlists	Links to Hotlist management UI
Turn on Flight Mode	Flight mode Toggle
Turn on Bluetooth	BT toggle
Set an Alarm	Clock CPL
Adjust the Clock	Clock CPL

[00164] The ordering and content of the top tasks hotlist can be static and based upon initial defaults with some restrictions. Users may be able to add tasks and order the hotlist. If softkeys are used, they will behave as follows:

SoftKey Number	Left SoftKey	Center Softkey	Right Softkey
1		Menu Icon	
2	Dynamic on Focus – Default Action		More – Navigate to Settings
3	Dynamic on Focus – Default Action	Menu Icon	More – Navigate to Settings

[00165] Menu items can include the following:

	Menu Items: 1. Action default 2. Settings 3. Add to Hotlist 4. Remove from Hotlist

[00166] Referring now to Fig. 23, the Recent Messages Hotlist will display the most recent incoming messages across all account types and transports. This list will combine Email, Text messages, MMS, IM, and Voice mails and serves as a way to quickly check for new mail. If softkeys are used they will behave as follows:

SoftKey Number	Left SoftKey	Center Softkey	Right Softkey
1		Menu Icon	
2	Dynamic on Focus – Reply		More – Navigate to Messaging application
3	Dynamic on Focus – Reply	Menu Icon	More – Navigate to Messaging application

[00167] Menu items can include the following:

	Menu Items: 1. View 2. Settings 3. Add to Hotlist 4. Remove from Hotlist 5. Reply 6. Delete 7. Dynamic Communication Method 1 8. Dynamic Communication Method 2 9. Dynamic Communication Method 3

[00168] Referring now to Fig. 24, the Recent Calls Hotlist will represent a subset of Call History. It will provide a list of callers and callees, coalesced so that only one item appears in the list for each individual. The list will indicate whether the last call was incoming or outgoing. If softkeys are used, they will behave as follows:

SoftKey Number	Left SoftKey	Center Softkey	Right Softkey
1		Menu Icon	
2	Dynamic on Focus – Call		More – Navigate to Call History application
3	Dynamic on Focus – Call	Menu Icon	More – Navigate to Call History application

[00169] Menus can include the following:

	Menu Items: 1. View Call details 2. View Contact 3. Set Reminder 4. Remove from Hotlist 5. Dynamic Communication Method 1 6. Dynamic Communication Method 2 7. Dynamic Communication Method 3

[00170] Referring now to Fig. 25, the Recent Programs Hotlist provides access to an MRU or MFU of applications. If softkeys are used, they can behave as follows:

SoftKey Number	Left SoftKey	Center Softkey	Right Softkey
1		Menu Icon	
2	Dynamic on Focus – Open		More – Navigate to full Programs list
3	Dynamic on Focus – Open	Menu Icon	More – Navigate to full Programs list

[00171] Menu items can include the following:

	Menu Items: 1. Open Program 2. MRU/MFU 3. Add to Hotlist 4. Remove from Hotlist

[00172] Referring now to Fig. 26, the Recent Music Hotlist shows playlists, albums, and songs recently played. If softkeys are used, they can behave as follows:

SoftKey Number	Left SoftKey	Center Softkey	Right Softkey
1		Menu Icon	
2	Dynamic on Focus – Play/Pause		More – Navigate to MY Music/WMP folder
3	Dynamic on Focus – Play/Pause	Menu Icon	More – Navigate to My Music/ WMP Folder

[00173] Menu items can include the following:

	Menu Items: 1. Play 2. Download New Music

	3. Add to Hotlist 4. Remove from Hotlist

[00174] Referring now to Fig. 27, the Recent Pictures Hotlist provides access to the most recently acquired pictures. This list should be rendered in a style that provides maximum visibility of the picture. This may mean a vertical filmstrip as shown below. Available metadata should be displayed as well. The size of the list will be driven by the date of the last images taken or acquired. Only a predetermined number of most recent images will be displayed. If softkeys are used, they can behave as follows:

SoftKey Number	Left SoftKey	Center Softkey	Right Softkey
1		Menu Icon	
2	Edit		More – Navigate to Picture viewer application
3	Edit	Menu Icon	More – Navigate to Picture viewer application

[00175] Menu items can include the following:

	Menu Items: 1. View 2. Share 3. Edit 4. Remove from Hotlist

[00176] Referring now to Fig. 28, the Operator Hotlist is a placeholder for providing access to services and applications. If softkeys are used, they will behave as follows:

SoftKey Number	Left SoftKey	Center Softkey	Right Softkey
1		Menu Icon	
2	Dynamic on Focus – Operator defined		More – Navigate to pIE
3	Dynamic on Focus – Operator defined	Menu Icon	More – Navigate to pIE

[00177] Menu items can include the following:

	Menu Items: 1. Action default

	2. Operator defined

[00178] Hotlists must be accessible using the primary navigation hardware control (dpad, joystick, etc) as well as stylus for touch screen devices (conforming to the view/filter widget). Default focus should be the first item in the list. Hardware access to items in the Hotlist should conform to appropriate specs for Lists and Menus.

[00179] Referring now to Fig. 29, access to all settings controls can be through a Settings list. This list is accessed through the "More" Softkey from the top task hotlist. The default settings list will be a vertical list of frequent or recent tasks. A pivot control will allow access to categories of settings. These may be represented as icons and arranged in grids. The default categories may be the Pocket PC (PPC) tabs.

[00180] In order to populate the MRU category of Device Settings, the system recognizes the control panel or CPL last used and assigns a Task name that a user will recognize. This may be as granular as the list item of a control or as broad as a category of items. For instance, if the user selected Settings::Security::Enable SIM PIN that task might be exposed in an MRU as Enable SIM PIN. Similarly, if the user adds a GPRS connection the task in the MRU list might be called "Add GPRS Connection." This task extractor would also allow users to add specific tasks to the hotlist.

[00181] From within a list or CPL, a user may select "Add to Hotlist" from the menu. This will launch a picker to allow selection of the hotlist in which the task should be added. Alternatively, the system may determine the appropriate hotlist. After selecting the hotlist, the user may position the task in the desired spot in the list. As a default, new items will be added to the top of the hotlist.

[00182] In addition, as discussed above, the search function may return access points to common tasks. For example, if the user enters the letter for "Ring," the list can display an access point for the ringtone control.

VI. LISTS

[00183] A list is the primary access point for information on portable devices. Lists should be flexible to allow more visually appealing renderings and dynamic to enhance high resolutions and large displays. Lists may be used in combination with View/filter controls (*e.g.*, pivot control) in order to allow resorting or filtering of content. This may result in constraints to the navigation of the list or to the types of lists that may be used.

[00184] Three main list types can be supported: vertically scrolling (*e.g.*, Contacts), horizontally scrolling (*e.g.*, the desktop filmstrip), and grids (*e.g.*, the Start Menu). Users and third parties should be able to create new lists that render in visually compelling ways, provided they fall into one of the three main types. For instance, an operator may want to provide a horizontally scrolling carousel of pictures, or a vertical scrolling filmstrip-like list of buddies.

[00185] Lists may render differently depending on orientation, display size, or resolution. For instance, a messaging list viewed primarily in a high resolution, landscape orientation may display more or richer information per item then the same list displayed on a portrait display device. Lists should redraw dynamically when changing between portrait and landscape to take advantage of the additional screen width. Lists should also allow for dynamically updating content. For instance, a contact list might show up-to-date presence information.

[00186] List item height may vary according to the type of list and intended usage. For instance, a list of important people may display only one person per screen, while a list of messages may display 10 or more. Further, the list may support expanding/collapsing groups (like Magneto Company View in contacts) and thumbnails with a preview (as in the desktop filmstrip).

[00187] Lists may render using transitions (as in between filters), animations (on focus change), and watermarks or background graphics. These should be theme-able and skin-able.

[00188] Referring now to Fig. 30, vertically scrolling lists are a single column wide and are navigated solely by using Up/Down hardware or the scrollbar thumb. Although L/R may be used in conjunction with these lists, the movement is not used to navigate through the list. New types of vertical lists may include a vertical filmstrip. Scrollbars can be suppressed or present.

[00189] Referring now to Fig. 31, horizontal lists are consumed by scrolling left/right. The filmstrips on the desktop are examples of horizontally scrolling lists. Carousels are also essentially horizontally scrolling lists and may also be used. Items in the lists may have a "z" value to allow front to back ordering. Items may extend off screen. Scrollbars can be suppressed or present.

[00190] Referring now to Fig. 32, grids (like the Start Menu on SP, calendar week and month views, and the thumbnails viewer in the picture application) use both U/D and L/R to navigate the list. Any grid size may be supported. The size of the grid may be constrained through guidelines and best practices. Some grids may map to hardware, such as the number pad. Grids may extend off-screen. In addition, grid items may be of multiple heights within the same list.

[00191] The purpose of the list is to display items. Lists can provide multi-cell item support, expanded multi-height support and mixed item-type support. Multi-cell items are individual list items that can have multiple "cells" or columns populated with data. Expanded multi-height support includes rendering item heights ranging from a single text line to full screen. Mixed item-types are items; a list should be able to render multiple types of items (*e.g.*, image and text).

[00192] Referring now to Fig. 33, individual list items may have multiple "cells" or columns that can be populated with data. For instance, a messaging list item may have a column or cell for an icon, a cell for message content, and a cell for presence of the sender. These cells may have different context tasks associated with them.

[00193] Referring now to Fig. 34, the range of list types requires that multiple item heights be supported. A vertical list composed of single line text items may be required in some cases, while a carousel of images may be required in others. Essentially, any list type should be able to support a range of heights from single line to full screen, potentially in the same list.

[00194] Referring now to Fig. 35, items with a mix of content types must render in a list. The list should support icons and text in the same item. In addition, the lists should allow images and text to render in the same item. Further, the image may be used as the background of the item with text overlaying it. Within the same list of objects, a filter or sort may change the way the list items are rendered. For

instance, within a contact card a filter may exist to show communication types (which renders as a vertical list) as well as photos (which may be rendered in a grid).

[00195] Referring now to Fig. 36, in addition, lists should support groupings with expand and collapse behavior. A group may be rendered using multiple styles, including a grid, filmstrip, etc. Lists should also support a "tree" behavior similar to that in File Explorer in the Windows operating system. In a list of grouped items, navigation will behave in the following manner:

- For Text based lists: HW control Up/Down will move focus between group labels
- Action on the label will expand/collapse the label
- Expanding the group maintains focus on the label
- HW Down from an expanded label places focus on the first item in the group
- HW Down on the last item in the group jumps focus to the next label

For grouped grids or horizontally scrolling lists:
Option 1 (same as above)

- HW control Up/Down will move focus between group labels
- Action on the label will expand/collapse the label
- Expanding the group maintains focus on the label
- HW Down from an expanded label places focus on the first item in the group
- HW Down on the last item in the group jumps focus to the next label

Option 2

- HW control Up/Down will move focus between groups (no focus on the label, all items visible)
- Action on the group opens menu, default selection is "view"
- HW Down places focus on the next group

[00196] Grouped items should include a group label and quantity indicator. An action on the group label can expand or collapse the group display. The list can support multiple render styles. In addition, users can create custom groups.

[00197] Referring now to Fig. 37, the system can be capable of rendering lists in several default styles. These are analogous to the desktop file explorer "Views." The following default styles should be supported: Filmstrip with horizontal or vertical scrolling, Carousel with horizontal scrolling, Thumbnail (*e.g.*, a grid), Name list (vertical scrolling, single-line) and Details (vertical scrolling, multi-line). Multiple styles may appear in the same application and be selected using filters, menu items, or softkeys. When used with a pivot control, for instance, a list of music sorted by album may render as a carousel by default, but when pivoted and sorted by artist may render as a Name List

[00198] The items in a list may be arranged or sorted by metadata defined by the application. A sort does not remove content from the list, it simply reorganizes the content. For instance, Music may be sorted by genre, Album, or artist, etc. A filter is a subset of the items in the list. For example, messaging lists may be filtered by account type, for instance or by time (recent mail).

[00199] A filter may be applied to a specific sort type or even to another filter. In these cases, a pivot control may be used in conjunction with a menu. For instance, in a Messaging list sorted by accounts (using the pivot control), a user may wish to apply a category filter using the menu in order to only see work email from Team X.

[00200] An application may specify a default sort of a list. Users may also specify default sorts. Upon reentry to the list after timeout that returns the device to the Homescreen, the default sort may be restored. Similarly, a list that has been filtered may be returned to its "All" or unfiltered state. This resetting should be done with care to prevent the loss of user work. In general, sorts performed by the user should be respected as they may serve as the expected mode for consuming all the items in the list. Filters, however may be temporary and used as part of task flows. For instance, it may be acceptable to reset a calendar view from Month to Agenda for the current day upon reentry to the Calendar app. However, changing the Messaging list from one account type to another and resetting the filter to "All" from "My Team" may not be acceptable.

[00201] When applying a filter or sort to a list or transitioning into or out of the list, the list may render with animations. List items may animate on drill. Backgrounds of lists may have animating watermarks. A highlight may animate as it transitions from one item to the other. Animations may also play during accelerations.

[00202] When entering a list, the default focus will be on the pivot control if one is used. If no pivot control is used, focus will be on the first item in the list. Focus on an item will determine the contents of the menu. Focus in the list will be shown by a highlight state. The highlight may animate as it transitions from item to item. A highlight state may also scale the item (*e.g.*, the item may appear larger compared to other items in the list). The downstate of the item may also animate.

[00203] Referring now to Fig. 38, multiple items in a list may be selected using menu support or, potentially, on screen common controls. For instance, in a picker

list of people a user may select multiple items by tapping on them. The selection state may be indicated by a visual cue like a graphic (checkbox) or colored surround. When entering a card list, focus may be on the first item in the list.

[00204] Lists will scroll using hardware and stylus and wrap using the wrapping behavior. The highlight on an item will move one item at a time unless the hardware control is held down. Holding down the hardware for a predetermined number of seconds will accelerate the scrolling. Holding down the control for a predetermined number of seconds jumps focus to the top or bottom of the list. This "hyperscroll" may also render with an animation.

[00205] Some lists may also accelerate using a "brought-to-you-by" feature as found in contacts. The jump steps may be specified by the application and may be extensible. The steps may also vary by filter. For instance, a message list sorted by People may jump alphabetically, while the list sorted by date may jump based on one week ago, two weeks ago, etc. Some elements visible in a list may not scroll. For instance, if a pivot control is used, it will not scroll as a user navigates the list.

[00206] A user can navigate the list using hardware U/D, L/R and stylus. With focus on an item in a list, the down state of the hardware controller will deploy the menu. Pressing the action key twice within a predetermined period of time (*e.g.*, .5 seconds) will suppress the deployment of the menu and execute the default item. Tapping an item in a list with stylus will place focus on that item. Tapping twice on an item within a predetermined period of time (*e.g.*, .5 seconds) will also suppress the deployment of the menu and execute the default menu item.

[00207] A "Back" button can be required for all devices. If a pivot control is used in a list, the back button will move focus from within the list to the pivot control.

[00208] A list may have a background graphic that is an image, a code drawn gradient, or an ambient animation. An ambient animation is a graphic element that slowly changes behind the items in the list. It may be code drawn (an aurora glow that slowly changes) or an image that animates using a type. The background may be changed by the user or an operator. The background may also change based upon context.

[00209] Content of an item in the list may not be completely visible due to screen size restrictions. On focus, item content may "marquee" or auto scroll horizontally to reveal all the available information.

[00210] Lists should be able to make maximum use of the display orientation and resolution. This means a list should display more content on a landscape high-resolution device. The content difference between portrait and landscape should be dynamic, allowing the content to flow correctly when the user changes orientation.

VII. FLAGGING

[00211] Flagging (also known as "pinning") is a process by which a user or partner may promote access and visibility of data. For instance, a user may flag a person as being very important. This property may then be used to arrange a list of people based on that property. In addition, the property can be used as a filter (*e.g.*, show only email from important people, etc.) Similarly, a user may flag a phone call with a reminder to call, a message with a task, a picture for display on the home page, or a URL for quick access from a list of URLs.

[00212] Flagging allows users to differentiate important information. For example, a user has a few people she communicates with daily. She flags those people and adds them to her Hotlist of people. Now she can quickly access all the communication methods available for those people and monitor their status. Flagging also allows users to quickly perform frequent tasks. In addition, flagged items can be shown in hotlists. For example, a user frequently sends a status mail to his team. The user can open and compose a note and add recipients. The user can then flag the item and add it to his Hotlist of tasks. Now he can quickly access and send status to his team. A flag can also be used to create a prompt to perform a task. For example, while reviewing her communication history a user sees a call from a customer. She cannot call back right now, so she flags the item for a follow up call. In two hours, a reminder will fire with the call information.

VIII. HOMESPACE AND TILES

[00213] The home space is the launching point for all of the device experiences providing users with a known starting point. It may be reached by pressing the "Home" hardware button, which can be a mandatory component of all products utilizing the system. The home space should allow the user to monitor events,

information, and people in their world and to personalize that experience. The homespace should allow users to access content at a glance. The home space can reflect the personality and interests of the user.

[00214] The home space should be extensible to allow partners, OEMs, and Operators to provide specific products and services. Operators may replace the default Home space with their own home space provided there is a visible, consistent affordance to access the hotlists. The home Space may be branded and may contain branded elements. The access point to hotlists can be a branded element and may not be changeable by operators.

[00215] This invention uses placeholders (*e.g.*, plugins) on the top-level screen of the mobile device, which can show user defined relevant groups of information. In this way, the user can get access to his content with minimal effort and least physical interaction. Tiles define this plug-in space where groups of information can be shown and updated depending upon the nature of content. Usually very high-level content is represented. A tile can be a visually rich, subset of content.

[00216] Fig. 39 illustrates a tile space on a top-level screen (*e.g.*, the home space screen). The active tile, which has focus, is displayed in the summary view. In the summary view, the tile is displayed in the center of the screen and expanded. The active tile shows more information than the background tiles that surround it.

[00217] Background tiles are displayed using the thumbnail view, also referred to as the icon state. Background tiles have less ability to show information. In most cases, this is binary information in the form of a notification which indicates any change in the space or information to which the plug-in refers. For example, the arrival of a news related information or notification of a meeting for tile representing a calendar would be indicated on the thumbnail view. Background tiles can be regularly updated based upon their content.

[00218] Referring now to Fig. 40, the tile space is a grid of square graphic placeholders, which can be navigated using the navigation key of the mobile device (see Fig. 40). The grid is not limited to the area of the display screen. As users navigate, tiles may go off screen. Only one tile is always in focus or in the summary view. The rest of the tiles are in the background and in the thumbnail view. Using the navigation key changes the focus and brings a new tile in the summary view. For example, if the left key is hit, then the thumbnail view of the tile to the left of the

current tile will render the summary view in the center. The previous tile will transform to the thumbnail view and go to the background. Figure 40 shows the navigation sequence and the changes in the Tile user interface. The summary view typically provides additional information. For example, the user may have an eBay tile on his homespace. The thumbnail view may highlight when a bid has changed on an item on which the user is bidding. The summary view can provide additional information indicating the change in bid.

[00219] Tiles can be of different types based on the type of content they show, services they use and the access they provide to the user to applications. The system can include a variety of tile categories including: lightweight tiles, content tiles, online service tiles, start tiles and application tiles.

[00220] Referring now to Fig. 41, a series of tiles are illustrated. A lightweight tile 4100 resides only in the tile space. There is no link with any content on the other applications on the device. Their life is determined by how much time the user will use the particular content. For example, a parking meter tile which tracks time left in a parking meter and is available only at the tile space.

[00221] A content tile 4102 represents content and can be targeted to any place in the phone software. For example, a contact card can lead to the contact listing of the person, whereas a group of contacts can go to a category in the hotlist (list of favorites). For example, a content tile can be a shortcut to a person from your contact list.

[00222] The online service tile 4104 is dependent on a service provider and the information on the tile can be refreshed based on a service activation or subscription by the user. For example, a weather tile can be activated during manufacture. Specific tiles like shopping services may be based on subscription. For example, an online service tile could include a collection of the same content type, such as CNN news articles that can be flipped through in the summary view. The online service tile can be updated, for example, the tile could include a RSS news feed and provide streaming headlines.

[00223] The start tile is a collection of "Hotlists" and is a collection of content grouped in recent, MRU, MFU, or pinned. The Hotlists are a collection of favorite channels that the user is exposed to from the Start Tile. The Start Tile therefore acts as the gateway to the host of applications and content organization in the Hotlists.

[00224] An application tile 4106 is a shortcut to an application. Activation of the tile launches the application without going to the list of applications for search and selection. Tiles are basically plugins as defined earlier. Depending upon the nature of content, the application it relates to or the information it shows tiles can function in a variety of ways

[00225] Tiles can be created by an authoring application available with the software or they can be provided by a vendor. The users can then subscribe to a service for the tile. Depending upon the place in the application, the user is provided the choice of making a particular view or content plug in to the tile space.

[00226] The tile space may be dynamic. Users can add, delete or rearrange tiles. In addition, users may create a profile that automatically updates the visible tiles based upon time of day, day of week, location or any other indicator of a change in context. In addition, tiles may be arranged automatically. Tiles can include gravity, such that like tiles tend to gravitate to each other. The tile space may be effectively divided into sectors or quadrants, where related tiles are arranged within the quadrants.

[00227] Accessing content and applications represented on the tile is achievable by using the default action button on the hardware of the mobile device. In the case of a touch-enabled screen, the tiles can be activated to access content by using the stylus. The subsequent location after tile activation depends on the nature of the tile (*e.g.*, a contact card will launch a card view of the person on the tile), information on the tile and customization by the user. For example, if the user defines the target of the tile to be a particular place in the application or the content area, then the default target will be overridden.

[00228] The tile architecture and schema may be published so that software vendors and users can create tiles. The tiles can be any usable size. A maximum number of characters can be defined.

IX. SOFTKEYS & MENUS

[00229] SoftKeys can provide access to tasks. Softkey design should be flexible enough to allow Operators and OEMs to choose to use 0-3 softkeys. The default experience should be three onscreen softkeys, although only two hardware

softkey buttons need to be used for SP. The middle softkey (MSK) will be mapped to the down state of the 5-way control. The MSK will launch the menu with stylus interaction on touch screen devices.

[00230] In general, the Left Softkey (LSK) can be used for the most common global task (New, etc). The Middle Softkey (MSK) can provide access to a menu. The Right Softkey (RSK) can be the most common context-specific task.

[00231] Softkeys may be context sensitive. They may dynamically update based on list item focus. For example, in a list of contacts a softkey may reflect the default communication method of the contact in focus.

[00232] When using less than three softkeys, the assigned task will transfer to the menu. When using no softkeys, all tasks must be accessible using the menu. A touchscreen device must always have at least one SK for menu access using the stylus.

[00233] Conventional portable devices are designed in a very static configuration of onscreen user interface elements. These requirements limit the ability of manufacturers to differentiate their designs from their competitors. In order to enable greater differentiation of hardware configurations, the system will be designed in such a way that it flexibly displays the on screen user interface buttons located at the bottom of the screen (*e.g.*, softkeys). The minimum number of supported softkeys will be zero and the maximum number of softkeys will be three. OEMs will also be able to turn on or off the rendering of softkeys based on their specific needs. In general, the system will optimize the use of the available softkeys for all applications.

[00234] Whether or not the on-screen configuration of softkeys is automatically determined or updated by a registry setting, there will be recommended softkey behaviors for each of the four softkey rendering possibilities. In general, a touch screen device should have at least one softkey, which is dedicated to deploying the menu. Non-touch Screen devices should not be required to have a softkey dedicated to deploying the menu. The following table indicates the recommended softkey behaviors in the various Hardware and Software configurations:

Hardware	Softkeys			
	0	1	2	3
Touch Screen	Not Advised	Menu	Menu & Task	Menu & 2 Tasks
Non-touch screen	No softkeys	Menu (preferred)	1 -Menu and Task	Menu & 2 Tasks

		or Task	or 2- Task and Task	

[00235] A "Task," as used herein, is the verb or on screen description of the action the user intends to take. The architecture will be flexible and render softkeys based upon a hardware profile and registry setting that enables OEMs to customize the softkey configuration for the device.

[00236] For any application or space, users will need access to settings and options that help them accomplish their goals and tasks. When users' needs are not immediately met by the Software implementation of Softkeys, a menu will always be available to provide access to user interface touch points. The system can provide a consistent and easy to use menu system for portable devices. It will also provide for greater flexibility in menu extensibility by increasing the number of menu items available to users, without compromising the aesthetic appeal of using the device. Menus can also be used to quickly re-access new events, notifications and reminders.

[00237] Menus will provide users access to tasks. The most common tasks will be accessible through Softkeys but may also be available in the menu. In general, the system will provide access to the menu from the down state of the 5-way control as well as the softkey label on touch screen devices.

[00238] The menu should be flexible enough to work with or without softkeys. Menus should be extensible and allow for scaling. Additional menu items may be managed using a cascade menu. Alternatively, additional menu items can be accessed using "more". For example, a deployed menu can have at least ten visible items. The remaining items in a menu will be accessed by selecting a menu item labeled "more."

[00239] Menus can be context sensitive to the item in focus when the menu is deployed. The menu may also include global menu items (*e.g.*, New, Send/receive, etc.).

[00240] The menu can have a default focus. Typically, the default focus is the first item in the list. This item should not be destructive (*e.g.*, delete, etc). In practice, the default task should be equivalent to the "drill" or primary list action (*e.g.*, Open, Read, Go, etc.) Items may be numbered to correspond to hardware buttons or use shortcut keys tied to keyboards. The number of items in a menu should be dynamic and adjust based on orientation, display size, and resolution.

[00241] In the default implementation, menus will be accessed by pressing down on the center of a 5-way control. The menu can recognize a pair of fast presses or "double-tap" to bypass the menu and act on the default item in the list. In practice, this will allow rapid access to the "drilled" state of an item (typically a card view) while allowing other tasks to surface.

[00242] When the menu is launched using dpad "action," the menu can display the available items in a list. The item in focus will correspond to the "drill" behavior (open a card, view a mail, go to a website, launch an app, etc). When the maximum number of items that can be viewed in one menu are exceeded, "More" will be an option to access other items.

[00243] Referring now to Fig. 42, for touch screen devices there should always be an onscreen menu indicator. This will serve as a launch point for the menu. If a touch screen device uses softkeys, the indicator will be located in the softkey bar. For non-touch devices, the indicator may be a label for hardware. Non-touch devices are not required to have an onscreen indicator. When used, the indicator will be either an icon or a text string. The indicator can be centrally positioned on the bottom of the screen, in the softkey bar if one is available. The menu should respond to themes and should indicate both focus and selected states. In addition, the menu can support transitions and animations.

[00244] Referring now to Figs. 43, 44 and 45, a significant driver of the menu experience is softkey flexibility. The menus should support a zero softkey form factor, which means all scaling and menu interaction must potentially be softkey independent. If softkeys are available, menu items should move as designated below to their appropriate softkey. "Close" should be the first menu item to move to a softkey. A user should be able to close a menu using tap on touchscreen devices

[00245] In mapping menu items other than More and Close to softkeys when menus are open, applications must identify which items in the menu are to be assigned to softkeys when the menu is closed. An application may duplicate softkey tasks in the menu, thus enabling a completely dpad-driven experience.

[00246] The size of the menu should be dynamically determined by the available real estate to display the menu. A full menu, regardless of the number of items will be referred to as a "set." A set might be 14 or more menu items. At a minimum, 10 items should always be available in a set.

[00247] To display more items than can be shown in one set, the user will select "More." This item must be available either in the menu set or in softkeys. Selecting More will redraw the menu with the next available menu items. Hitting More repeatedly will cycle through all available menu sets. There will not be a disabled state of More. If the last menu is less then a full set, the first items will not flow into the menu. For example, as illustrated in Fig. 40, if there are 23 items in a menu, set 1 will have 10, set 2 will have 10, and set 3 will have 3. When the menu redraws, focus will appear on the first item, regardless of where focus was in the previous menu set.

[00248] Menu items should be numbered if a number pad is available. If items in the menu exceed 10, item numbers should not be used. If a hardware keyboard is available, shortcuts may be assigned to menu items to drive menus from the keyboard.

[00249] Cascades can be allowed to remove clutter from menus and group conceptually related items. Separators can also be used allowed to group related items.

[00250] The menu controls should facilitate easy access to and navigation through the menus. The controls may be dependent upon the available hardware. The menu can be deployed by "actioning" on the d-pad or tapping the middle softkey. In addition, the device may include a specialized button, such as the center softkey hardware button.

[00251] When choosing an item on the menu, a d-pad will enable navigation through the list. Actioning on an item chooses the item. If the user places focus on an item and presses action twice (*e.g.*, d-pad center depress) within a predetermined time period, the default menu item should be selected. This is roughly equivalent to the double tap on a desktop operating system. In this case, the menu should be suppressed and not partially draw. This may mean that a certain delay must be introduced between trapping the first "action" and rendering the menu (or animating the menu).

[00252] There can be multiple ways to close the menu. Choosing an item closes the Menu. The close softkey, when present, and the close menu item will close the menu. Left/Right hardware can also be used to close the menu. Magneto scroll wrapping rules will also be observed.

To Get...	User must...
Focus on a list item	Move Up/Down with Hardware control
A Menu	Press dpad "action"
Drill (Open, View, Go, etc)	Action on default item in a menu OR Press action twice within predetermined time period

[00253] In addition, navigation through the menu may be driven by software rather than hardware, particularly for touchscreen devices. Tapping an item in a list will place focus and rather than drilling into the item. To deploy a menu on an item not in focus, a user would tap the item and then tap the menu indicator. If the user taps an item in focus, the item should Open (drill). If the user taps twice on an item (either with or without focus) regardless of time delay between taps the item should Open (drill).

[00254] Choosing a menu item can also be done by tapping. Hitting the menu indicator with a stylus or finger will deploy the menu. Tapping on an item in the menu will select it and close the menu.

[00255] The menu will close when the user selects an item, taps outside the menu space or taps close men item. In addition, the left/right d-pad may also close the menu.

To Get...	User must...
Focus on a list item	Tap the item
A Menu	Tap the menu indicator
Drill (Open, View, Go, etc)	Action on default item in a menu OR Tap twice on any item

[00256] Menus may also include notifications, a "More" item and a "Close" item. A notification space (or alerts that notifications exist) may exist in the menu. If present, it will always occupy the first menu item (item 0). It may not have focus by default. To support action/action for fast drilling of list items, the menu should always have default focus on the item that allows drilling. Menus can also provide

the ability to view more items. When there are no software softkeys, then "More" will be the next to last item. Menus will be closed using "Close." If there are no software softkeys, then close will be the last menu item. If softkeys are used, "Close" will move to softkeys.

X. NOTIFICATIONS

[00257] Users must understand the state of their device and the changing availability of information. As new data becomes available (such as messages or contact presence information) or the importance of existing data changes (task due dates arrive or event reminders occur) the user must both be made aware of these changes and be empowered to act on them in a consistent way.

[00258] In conventional systems, the notification system is tied to the display of icons in the title bar, toasts or full-screen dialogs, and softkeys. The limited real estate of the title bar leads to a scaling issue in that a large number of status and message icons (over 30 and potentially many more) must exist in a constrained number of "columns". Further, the title bar may be suppressed by operators and OEMs. The notification system described herein will reduce reliance on the tile bar to indicate status of the device and provide access to settings and notifications.

[00259] The system provides an extensible notification system to support an enhanced dialog between ISVs, apps, and the user. This requires a new way to provide access to certain classes of notifications and a way to manage access over time. Finally, the new system of notifications should provide a way to minimize the disruption that full-screen notifications can cause. While certain notifications may be time critical and require full screen rendering, photon will allow users to quiet down the interruptions while maintaining an understanding of change on their device

[00260] In order to control disruptions caused by default full-screen notifications and the potential proliferation of new notification types, the system can provide new classes of notifications: time critical, normal and system dialog. Time critical notifications (*e.g.*, incoming calls, event reminders, IM requests, etc.) and as well as additional types may be rendered full screen by default. The system may provide a base set of critical notifications. Users or third party vendors may add additional critical notifications or remove existing critical notifications.

[00261] Normal notifications are not time critical and are not rendered full screen by default. Specific types of notifications may be made to render full screen by the user. For instance, a user may wish all incoming SMS messages to be rendered full screen.

[00262] Photon will consolidate dialog boxes and alerts system dialogs into a System Dialogs notification class. This will allow softkey interactions (where supported) and increased interaction possibilities. Dialogs pertaining to battery state, confirmations, and DRM may be considered system dialogs. These can be rendered full screen and may not be adjusted by user or third party.

[00263] To provide complete control over the notification system, a user should be able to identify which individual notifications they do not wish to ever see again, as well as whether certain classes should be full screen by default. Third parties may also establish full screen vs. not full screen states for their notifications, provided users may override this selection.

[00264] The notification system should support new notification types by default. MOs/third parties should be able to create new types and define the class to which they belong.

[00265] Referring now to Fig. 47, a notification may be represented in three different states: an icon, a list item or a detail. The icon state may be rendered in a plug-in on the home screen and may consist of an icon and a numeric indicator (*e.g.*, 3 Messages, etc.). This icon may be used in the menu indicator. The List State may include the icon but also reveals a subset of information about the notification's details. This is roughly analogous to the existing single email item Magneto behavior or the SP multiple reminder behavior. The content is rendered in a list. The Detail State of a notification displays all the available information about the item. In some instances, this will map to an open read card (*e.g.*, email, SMSs, events, incoming call, etc). The detail state will commonly be rendered full screen.

[00266] When a notification with a no-full-screen class is received, the menu indicator in the Soft key will change state to reflect the type of notification received. The notification icon will animate for a period of time. If no softkey bar is used, the menu indicator will appear on screen in a transparent center softkey and behave as above. Multiple, mixed types of notifications will be indicated by a "bubble" icon.

[00267] Referring now to Fig. 48, the menu indicator will revert to the no-notification state once the Notification Hotlist has been displayed, either through the menu access point or the "Start" access point on the homescreen.

[00268] Referring now to Figs. 49, 50 and 51, when a new notification is received of the non-full screen type, the menu will display a menu item 0 that is the access point to the notification Hotlist. Consequently, the menu system provides a global access point to notifications. As an option, if only one notification has been received, Menu Item 0 may link to that single item. The use of Menu Item 0 will be conditional on the existence of a notification. If no new notification is available, or if the menu indicator icon has been reset, Item 0 will be removed from the menu. However, no menu item may exist as Item 0 except Notifications. The region of the menu for Item 0 will be display a TBD visual indication. As illustrated in Fig. 51, this state will persist across multiple menu screens, accessible using "More."

[00269] Referring to Fig. 52, the List State of notifications can also be rendered in a Hotlist, (*e.g.*, What's New?). This list represents a location for aggregating all notifications, whether unviewed, snoozed, or un-acted upon. The Hotlist will display information about the item in a multi-line height list.

[00270] Icons indicating status related to a notification may be displayed in the Status bar. For instance, the battery indicator icon may be visible across the application in the Status Bar. A "Low Battery" System Dialog notification may be generated should the battery level fall below a certain amount. This indication may also be displayed iconically in the status bar.

[00271] Similarly, connection state, the availability of other connections, and other dynamic states may be indicated by a specific icon and a notification may be generated. The notification may contain access points to settings, controls, or control panels (cpls) that support likely user actions related to the notification.

[00272] The status bar should not provide primary access to settings or serve as a primary shortcut to the detailed view of a notification. Access to settings related to icons in the Status Bar on the Home Screen may be provided by tapping on the icon, but there must be another means to access settings. The Status Bar may not be hardware accessible on non-touch devices.

[00273] Notifications, alerts and reminders may behave in the following manner:

Type	Mobile device Behavior			
	Status Bar icon	Home	HotList	Application/Card Menu
Single e-mail message	None	Plug-in (account specific)	List item	
Multiple e-mail messages	None	Plug-in (number and account specific)	List items	
Single SMS message	None	Plug-in	List items	
Multiple SMS messages	None	Plug-in	List items	
Incoming Call	None		List items	
Missed Call	None	Plug-in	List items	
IM request	None		List items	
Voicemail	None	Plug-in	List items	
New WiFi available	None		List items	
Multiple WiFi available	None		List items	
Single Event Reminder	None		List items	
Multiple Event reminders	None		List items	
Task Reminder	None		List items	
Battery Alert	prevalent			
Confirm Dialog	None			
Warning Dialog	None			
Information Dialog	None			

XI. BACK BEHAVIOR

[00274] Users need an easy way to return to the screen(s) that they have previously viewed. Users can do this using the back button, which may be required on both non-touch screen and touch screen-enabled devices. The back stack and back button behavior are essential in order to navigate back to any previously visited screen, delete any amount of text, navigate backward through web pages, or to close a

menu. On all devices, the back behavior can be enabled by a back button. On touch screen devices, users will also be able to close a menu by touching anywhere on the screen that is not covered by the menu.

[00275] In general, the back mechanism should provide users with a consistent and predictable navigational mechanism to undo previous actions or to return to previous screens. The back mechanism should also provide users with a consistent and learnable mechanism for deleting text as well as a mechanism for closing the menu. However, the back mechanism should not navigate through the pivot control, nor should it cancel processes. In general, the back mechanism should take a user back through levels and nodes, but not reproduce ever screen the user has seen in reverse order. The back mechanism should not take a user beyond the homescreen. Finally, the back mechanism should be platform independent, including touch screen devices.

[00276] In general, Back takes the customer to the screen he was on just before the current one. If the user visited one screen multiple times recently, duplicates are removed from the "Back path." If a menu is open, the back button closes the menu. If the customer is on an edit screen, Back acts as a backspace and is not used for navigation away from the screen. In text entry fields on edit screens and full screen edit, press and hold of the back button clears an entire field. Elsewhere, pressing and holding the back button may do nothing different than pressing the back button once. Alternatively, pressing and holding back may return the user to the homescreen. Finally, if the device is "thinking," (*e.g.*, doing something which shows the user a noticeable pause) back could act as cancel, and the customer should be able to immediately press any other button and get the normal response without delay. The application will need to know to "listen" for this Cancel request.

[00277] The following examples illustrate possible behaviors of the back mechanism:

Context	Behavior
1. From home a user has navigated to the Hot List Space placing the user on the default Hot List	From the Hot List Space, hitting back will take the user back home
2. From home a user has navigated to the Hot List Space, and then the user	From the Hot List Space, hitting back will take the user back to home.

navigates through a series of three Hot Lists	
3. From home a user has navigated to the Hot List Space, and then the user navigates through a series of three Hot Lists. The user opens an item within the third Hot List.	• From the card, hitting back will take the user to the Hot List Space • From the Hot List Space, hitting back will take the user back to home
4. From home a user has navigated to the Hot List, and has chosen to view the list view of the content displayed in hot list foo. To do so, the user hits see all or see more foo	• From the list view, hitting back will first take the user to the Hot List • From the Hot List Space, hitting back a second time will take the user home
5. From home a user has navigated to the Hot List, and has chosen to view the list view of the content displayed in hot list foo to find a particular item not displayed in the Hot List. To do so, the user hits see all or see more foo. The user then navigates to the item they'd like to view and opens it	• From the foo card, hitting back will take the user to the complete list view • From the list view, hitting back will take the user to the Hot List Space • From the Hot List Space, hitting back will take the user home
6. From home a user has navigated to the Hot List, and has chosen to view the list view of the content displayed in hot list foo to find a particular item not displayed in the Hot List. To do so, the user hits see all or see more foo. The user then navigates to the item they'd like to view and opens it. After opening the card, the same user would like to open up a calendar event contained within that card	• From the calendar card, hitting back will take the user to the foo card • From the foo card, hitting back will take the user to the complete foo list view • From the foo list view, hitting back will take the user to the Hot List Space • From the Hot List Space, hitting back will take the user home
7. In an text field	Back will delete the text in the field. It will not navigate the user to a previous field or screen.
8. If a menu is deployed	the back button closes the menu
9. If the user got into a card view without going through list view of that card	the back button *will not* take the customer through that card's list view before switching to the previous app. This behavior is similar to opening a contact card from call history.
10. If a user opens a card from a list, and then goes back to the list to open another card	• Hitting back from the second card will take the user to the list • Hitting back from the list will take the user to the level that originally placed the user in that list • Back will NOT take the user to

	the first opened card
11. When a user navigates through web pages	hitting back will take users to the previously viewed web page
12. If a user opens a web page 2 from another web page 1, and then returns back to the web page 1, with the goal of visiting a completely different web page 3	• Hitting back will return the user back to web page 1 • Hitting back from web page 1, will now take the user to the page that originally launched web page 1 • Back will not take the user to web page 2

XII. HARDWARE AND SOFTWARE INTERACTION

[00278] The system will support a range of hardware interaction components. The primary navigation interaction hardware must provide the ability to move focus Up, Down, Left, and Right. There must also be a mechanism for indicating "action". On a typical d-pad, "Action "is the down state of the center button. The response of the action button and the performance of the Left/Right should conform to the requirements specified in this document. The system must also allow for keyboard, numpad, stylus and other third party hardware.

[00279] The system can support 0, 1, 2, or 3 (or more) softkeys. These softkeys may be mapped to hardware buttons that act on the softkey. The default system configuration will provide three onscreen softkeys with the Middle SK (MSK) mapping to the "action" button of the 5-way controller. Pressing "action" or tapping the MSK will deploy the menu.

[00280] The system also should support touch interaction. In general, tapping a list item will not select and drill but will instead place focus on the item. Tapping an item in focus will deploy the menu. Tapping an item without focus and then tapping the middle softkey will deploy the menu. Tapping any item twice rapidly (either with or without focus) will drill into the item.

[00281] The system can support a general controller, such as the 5-way controller (Left/Right, Up/Down, action) as well as specialized buttons (Back, Home, Send and End). Back, for both touch screen and non-touch screen devices, can be used to return to the previous screen. The Home key should return the user to their homespace. Send and End are used for telephone communications.

XIII. FLEXIBLE SOFTKEY SUPPORT

[00282] The system should be flexible enough to support from zero to three softkeys. The system can use the "action" as softkey 3 and double-click action to perform traditional action operations. The system may render an empty bar where there are no softkeys. The system should also be backwards compatible, extending existing software code to allow up to three softkeys. The system may add register keys to determine how many softkeys to render as well as how many hardware buttons to use. For example:

```
[HKLM\System\Softkeys]
"Hardware"=dword:3
"Render"=dword:3
```

[00283] Referring now to Fig. 53, on softkey creation, an empty menu can be created and populated by iterating through the original menu, thereby reconstructing the menu in the required form. The system then uses the newly constructed menu to render the softkeys.

[00284] If there are more hardware keys than the system needs to render, the system doesn't actually render that softkey, but still responds to the physical button press.

[00285] For remapping action, the event can be modified to send a message to the shell to determine if the action key should be remapped and to determined whether to test for double clicks (double clicks are not always appropriate).

[00286] In addition, the system should provide for dynamically populated softkeys and their submenus and should reconcile with transformation to a toolbar. Multiple passes may be used to remap menus and improve backwards compatibility. However, automatic remapping of softkeys is not always appropriate. For example, if the menu includes a collection of operations or edit commands it may be preferable to keep those commands together, rather than splitting the commands by putting one in a softkey and leaving the rest in a menu on the third softkey. Alternatively, all softkeys may be reimplemented as a skinned toolbar.

[00287] In addition, the system may include the ability to specify where to draw menus. For example, if the device includes only one hardware button on the side of the device, the associated menu should be rendered proximate to the actual button.

XIII. DATA ACCESS

[00288] Increasingly, users want to find data for various applications in various scenarios, be it from the same application that creates the data or from a different application. Additionally, in each case the data displayed in a specific user interface not only may come from different sources, but it also needs to be filtered through various distinct experiences such as "word search" (a la MSN search, which implies some pre-indexing of the data at the word level), "incremental character-by-character search" (such as the search function described above) and "contextual search" (which uses any kind of data currently in context as a filter for searches on other kinds of data).

[00289] To support all these different search scenarios APIs should be exposed at various levels of abstraction ranging from the application data, through common controls, user interface helpers to track/accumulate keystrokes, methods to query for data, constructs to cache data, and all the way into the level of IME conversion of keystrokes into character strings. Of course, all of these APIs need to work well with each other to avoid duplication of effort at the various levels.

[00290] This section attempts to define all the different components that will be necessary (at varying levels of detail), and how they interact with each other in different scenarios.

[00291] **KSTR** – Keystroke sequence, where each keystroke has a vk code and a message source. Each keystroke sequence could map to one or many strings, depending on the language or custom user preferences. This is similar to the input to an IME.

[00292] **KSTR Tracking** – API set to help keep track of keystroke sequence so UI developer doesn't have to worry about which keystrokes are relevant, where they came from, whether the keystroke accumulator should be reset automatically, handle backspace, etc (HFKS InitFilterKeystrokes();ResetFilterKeystrokes(HFKS); AddFilterKeystroke(HFKS , wParam, lParam); FreeFilterKeystrokes(HFKS);)

[00293] **KSTR to Possibility list** – Would convert something like {VK_2, VK_3, VK_4} into something like {{"a", "b", "c"}, {"d", "e", "f"}, {"g", "h", "i"}}

[00294] **Does KSTR match String** – Would get possibility list from KSTR and then match this against string.

[00295] **Does String match KSTR (tentative)** – Would convert something like "ben" into something like {{VK_2, VK_B}, {VK_3, VK_E}, {VK_6, VK_N}}, and allow things like pre-indexing of database records by keystroke if we determine that indexing alphabetically is not enough for our purposes.

[00296] **Data Domain** – Abstraction wrapper around application data. IShellDataDomain as defined for context aware UI efforts. Allows standardized querying for data. Similar to the concept of DataInterface and DBFilt used in ListUI, but more focused and exposable to ISVs.

[00297] **Incremental character-by-character filter** – Would be initialized with a data source (string list or application Data Domain), and then would be able to give back the data elements corresponding to a passed-in KSTR. It would cache previous results as appropriate and detect whether it needs to do a full re-query or whether it can reuse existing results. This would be at the heart of smartfilter and applications like shfind.

[00298] **Smartfilter-enabled controls** – Applications could use the character-by-character filter directly, but we'd also provide more convenient wrappers for common scenarios, e.g.: listviews and listbox controls with integrated smartfilter for string lists, or a standard application data browser/filter if there's a Data Domain wrapper for the data in question.

[00299] **SHFindRelatedData** – "Search engine" API to look up data in data domain(s) specified, using a filter that could be text or a list of items in a different data domain. Could be made to interface with a "word search" search engine (like google or MSN search) underneath for some styles of queries.

[00300] **Unified context browser** – Default control for browsing cross-application data when UI designer wants to show data from different data domains that is related to current context. If current context is a specific contact card, browser will show a partial summary view of the contact card together with lists of related e-mails, appointments, files, etc.

[00301] **Contextual suggestions** – similar to smartfilter but tied-in to the concept of autosuggest, currently only implemented in ppc's compime.

[00302] The aforementioned systems have been described with respect to interaction between several components. It should be appreciated that such systems and components can include those components or sub-components specified therein, some of the specified components or sub-components, and/or additional components. Sub-components could also be implemented as components communicatively coupled to other components rather than included within parent components. Additionally, it should be noted that one or more components may be combined into a single component providing aggregate functionality or divided into several sub-components. The components may also interact with one or more other components not specifically described herein but known by those of skill in the art.

[00303] Furthermore, as will be appreciated various portions of the disclosed systems above and methods below may include or consist of artificial intelligence or knowledge or rule based components, sub-components, processes, means, methodologies, or mechanisms (*e.g.*, support vector machines, neural networks, expert systems, Bayesian belief networks, fuzzy logic, data fusion engines, classifiers...). Such components, *inter alia*, can automate certain mechanisms or processes performed thereby to make portions of the systems and methods more adaptive as well as efficient and intelligent.

[00304] It should be further appreciated that the methodologies disclosed hereinafter and throughout this specification are capable of being stored on an article of manufacture to facilitate transporting and transferring such methodologies to computers. The term article of manufacture, as used, is intended to encompass a computer program accessible from any computer-readable device, carrier, or media.

[00305] In order to provide a context for the various aspects of the disclosed subject matter, Fig. 54 and the following discussion are intended to provide a brief, general description of a suitable environment in which the various aspects of the disclosed subject matter may be implemented. While the subject matter has been described above in the general context of computer-executable instructions of a computer program that runs on a computer and/or computers, those skilled in the art will recognize that the invention also may be implemented in combination with other program modules. Generally, program modules include routines, programs, components, data structures, *etc.* that perform particular tasks and/or implement particular abstract data types. Moreover, those skilled in the art will appreciate that

the inventive methods may be practiced with other computer system configurations, including single-processor or multiprocessor computer systems, mini-computing devices, mainframe computers, as well as personal computers, hand-held computing devices (*e.g.*, personal digital assistant (PDA), phone, watch...), microprocessor-based or programmable consumer or industrial electronics, and the like. The illustrated aspects may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. However, some, if not all aspects of the invention can be practiced on stand-alone computers. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

[00306] With reference to Fig. 54, an exemplary environment 5410 for implementing various aspects disclosed herein includes a computer 5412 (*e.g.*, desktop, laptop, server, hand held, programmable consumer or industrial electronics...). The computer 5412 includes a processing unit 5414, a system memory 5416, and a system bus 5418. The system bus 5418 couples system components including, but not limited to, the system memory 5416 to the processing unit 5414. The processing unit 5414 can be any of various available microprocessors. Dual microprocessors and other multiprocessor architectures also can be employed as the processing unit 5414.

[00307] The system bus 5418 can be any of several types of bus structure(s) including the memory bus or memory controller, a peripheral bus or external bus, and/or a local bus using any variety of available bus architectures including, but not limited to, 11-bit bus, Industrial Standard Architecture (ISA), Micro-Channel Architecture (MSA), Extended ISA (EISA), Intelligent Drive Electronics (IDE), VESA Local Bus (VLB), Peripheral Component Interconnect (PCI), Universal Serial Bus (USB), Advanced Graphics Port (AGP), Personal Computer Memory Card International Association bus (PCMCIA), and Small Computer Systems Interface (SCSI).

[00308] The system memory 5416 includes volatile memory 5420 and nonvolatile memory 5422. The basic input/output system (BIOS), containing the basic routines to transfer information between elements within the computer 5412, such as during start-up, is stored in nonvolatile memory 5422. By way of illustration, and not limitation, nonvolatile memory 5422 can include read only memory (ROM),

programmable ROM (PROM), electrically programmable ROM (EPROM), electrically erasable ROM (EEPROM), or flash memory. Volatile memory 5420 includes random access memory (RAM), which acts as external cache memory. By way of illustration and not limitation, RAM is available in many forms such as synchronous RAM (SRAM), dynamic RAM (DRAM), synchronous DRAM (SDRAM), double data rate SDRAM (DDR SDRAM), enhanced SDRAM (ESDRAM), Synchlink DRAM (SLDRAM), and direct Rambus RAM (DRRAM).

[00309] Computer 5412 also includes removable/non-removable, volatile/non-volatile computer storage media. Fig. 54 illustrates, for example, disk storage 5424. Disk storage 5424 includes, but is not limited to, devices like a magnetic disk drive, floppy disk drive, tape drive, Jaz drive, Zip drive, LS-100 drive, flash memory card, or memory stick. In addition, disk storage 5424 can include storage media separately or in combination with other storage media including, but not limited to, an optical disk drive such as a compact disk ROM device (CD-ROM), CD recordable drive (CD-R Drive), CD rewritable drive (CD-RW Drive) or a digital versatile disk ROM drive (DVD-ROM). To facilitate connection of the disk storage devices 5424 to the system bus 5418, a removable or non-removable interface is typically used such as interface 5426.

[00310] It is to be appreciated that Fig 54 describes software that acts as an intermediary between users and the basic computer resources described in suitable operating environment 5410. Such software includes an operating system 5428. Operating system 5428, which can be stored on disk storage 5424, acts to control and allocate resources of the computer system 5412. System applications 5430 take advantage of the management of resources by operating system 5428 through program modules 5432 and program data 5434 stored either in system memory 5416 or on disk storage 5424. It is to be appreciated that the present invention can be implemented with various operating systems or combinations of operating systems.

[00311] A user enters commands or information into the computer 5412 through input device(s) 5436. Input devices 5436 include, but are not limited to, a pointing device such as a mouse, trackball, stylus, touch pad, keyboard, microphone, joystick, game pad, satellite dish, scanner, TV tuner card, digital camera, digital video camera, web camera, and the like. These and other input devices connect to the processing unit 5414 through the system bus 5418 *via* interface port(s) 5438.

Interface port(s) 5438 include, for example, a serial port, a parallel port, a game port, and a universal serial bus (USB). Output device(s) 5440 use some of the same type of ports as input device(s) 5436. Thus, for example, a USB port may be used to provide input to computer 5412 and to output information from computer 5412 to an output device 5440. Output adapter 5442 is provided to illustrate that there are some output devices 5440 like displays (*e.g.*, flat panel and CRT), speakers, and printers, among other output devices 5440 that require special adapters. The output adapters 5442 include, by way of illustration and not limitation, video and sound cards that provide a means of connection between the output device 5440 and the system bus 5418. It should be noted that other devices and/or systems of devices provide both input and output capabilities such as remote computer(s) 5444.

[00312] Computer 5412 can operate in a networked environment using logical connections to one or more remote computers, such as remote computer(s) 5444. The remote computer(s) 5444 can be a personal computer, a server, a router, a network PC, a workstation, a microprocessor based appliance, a peer device or other common network node and the like, and typically includes many or all of the elements described relative to computer 5412. For purposes of brevity, only a memory storage device 5446 is illustrated with remote computer(s) 5444. Remote computer(s) 5444 is logically connected to computer 5412 through a network interface 5448 and then physically connected *via* communication connection(s) 5450. Network interface 5448 encompasses communication networks such as local-area networks (LAN) and wide-area networks (WAN). LAN technologies include Fiber Distributed Data Interface (FDDI), Copper Distributed Data Interface (CDDI), Ethernet/IEEE 802.3, Token Ring/IEEE 802.5 and the like. WAN technologies include, but are not limited to, point-to-point links, circuit-switching networks like Integrated Services Digital Networks (ISDN) and variations thereon, packet switching networks, and Digital Subscriber Lines (DSL).

[00313] Communication connection(s) 5450 refers to the hardware/software employed to connect the network interface 5448 to the bus 5418. While communication connection 5450 is shown for illustrative clarity inside computer 5412, it can also be external to computer 5412. The hardware/software necessary for connection to the network interface 5448 includes, for exemplary purposes only, internal and external technologies such as, modems including regular telephone grade

modems, cable modems, power modems and DSL modems, ISDN adapters, and Ethernet cards or components.

[00314] What has been described above includes examples of aspects of the claimed subject matter. It is, of course, not possible to describe every conceivable combination of components or methodologies for purposes of describing the claimed subject matter, but one of ordinary skill in the art may recognize that many further combinations and permutations of the disclosed subject matter are possible. Accordingly, the disclosed subject matter is intended to embrace all such alterations, modifications and variations that fall within the spirit and scope of the appended claims. Furthermore, to the extent that the terms "includes," "has" or "having" are used in either the detailed description or the claims, such terms are intended to be inclusive in a manner similar to the term "comprising" as "comprising" is interpreted when employed as a transitional word in a claim.

CLAIMS

What is claimed is:

1. A method for enhancing usability for a portable device, comprising:
receiving input;
searching a plurality of types of data based upon the input; and
rendering results of the search to a display screen.

2. The method of claim 1, further comprising filtering the results of the search.

3. The method of claim 1, the search encompassing all of the types of data.

4. The method of claim 1, grouping the results of the search by data type.

5. The method of claim 4, further comprising navigating the results of the search using a pivot control, the pivot control provides for moving through a circular list of the groups of search results.

6. The method of claim 1, the types of data include at least one of an email, a word-processing document, a calendar event, an audio file format and a video file format.

7. The method of claim 1, further comprising searching as each character of the input is received.

8. The method of claim 1, the input includes at least one of audio input, handwriting images input, numeric input and alphanumeric input.

9. A method for enhancing usability for a portable device, comprising:
generating a filtered list that includes a plurality of items of at least two data types; and
dynamically updating the list items.

10. The method of claim 9, further comprising creating a profile, the filtered list is generated based upon the profile.

11. The method of claim 9, the filtered list is generated automatically.

12. The method of claim 9, the list items are manually selected by a user.

13. The method of claim 9, further comprising:
generating a second filtered list; and
navigating between the filtered lists using a pivot control that provides for moving through a circular list of the filtered lists.

14. A method for enhancing usability for a portable device, comprising:
providing a user with a homespace;
rendering one or more tiles on the homespace;
displaying information on the tiles; and
dynamically updating the tiles.

15. The method of claim 14, further comprising arranging the tiles automatically on the homespace.

16. The method of claim 14, further comprising creating a profile, the tiles are rendered based upon the profile.

17. The method of claim 14, the tiles include at least one expanded tile that has focus and includes additional information.

18. The method of claim 14, further comprising:
selecting a tile;
opening an application based on the selected tile.

19. The method of claim 18, the application is at least one of content local to the portable device, an applet and a web page.

20. A method for enhancing usability for a portable device, comprising:
determining availability of softkeys for the portable device;
supporting the available softkeys; and
rendering at least one menu based upon the availability of the softkeys.

21. The method of claim 20, further comprising optimizing use of the available softkeys.

22. The method of claim 20, further comprising providing for no more than three softkeys.

23. A method for enhancing usability for a portable device, comprising:
selecting a first content item; and
providing a user with a menu that includes at least one task associated with the first content item, the task selected based upon context.

24. The method of claim 23, the menu includes a second content item associated with the first content item, the second content item selected based upon the context.

25. The method of claim 23, the context includes at least one user preference.

26. A method for enhancing usability for a portable device, comprising:
selecting a first content item; and
providing a user with one or more softkeys that correspond to tasks associated with the content item, the tasks selected based upon context.

27. The method of claim 26, the context includes at least one user preference.

28. A method for enhancing usability for a portable device, comprising:
rendering at least one display object on a display screen based upon a context;
updating the display screen dynamically based upon the context.

29. The method of claim 28, the context includes at least one of an item on the display screen that has focus, at least one preference of a user.

ABSTRACT

The subject disclosure pertains to systems and methods for intuitive controls for a portable device that facilitate information retrieval and functionality based upon data and task relationships. A set of tools is provided to allow users to navigate through content and tasks stored locally on the portable device as well as access to remote content. The tools provide users with a personalized, filtered view of content and tasks.

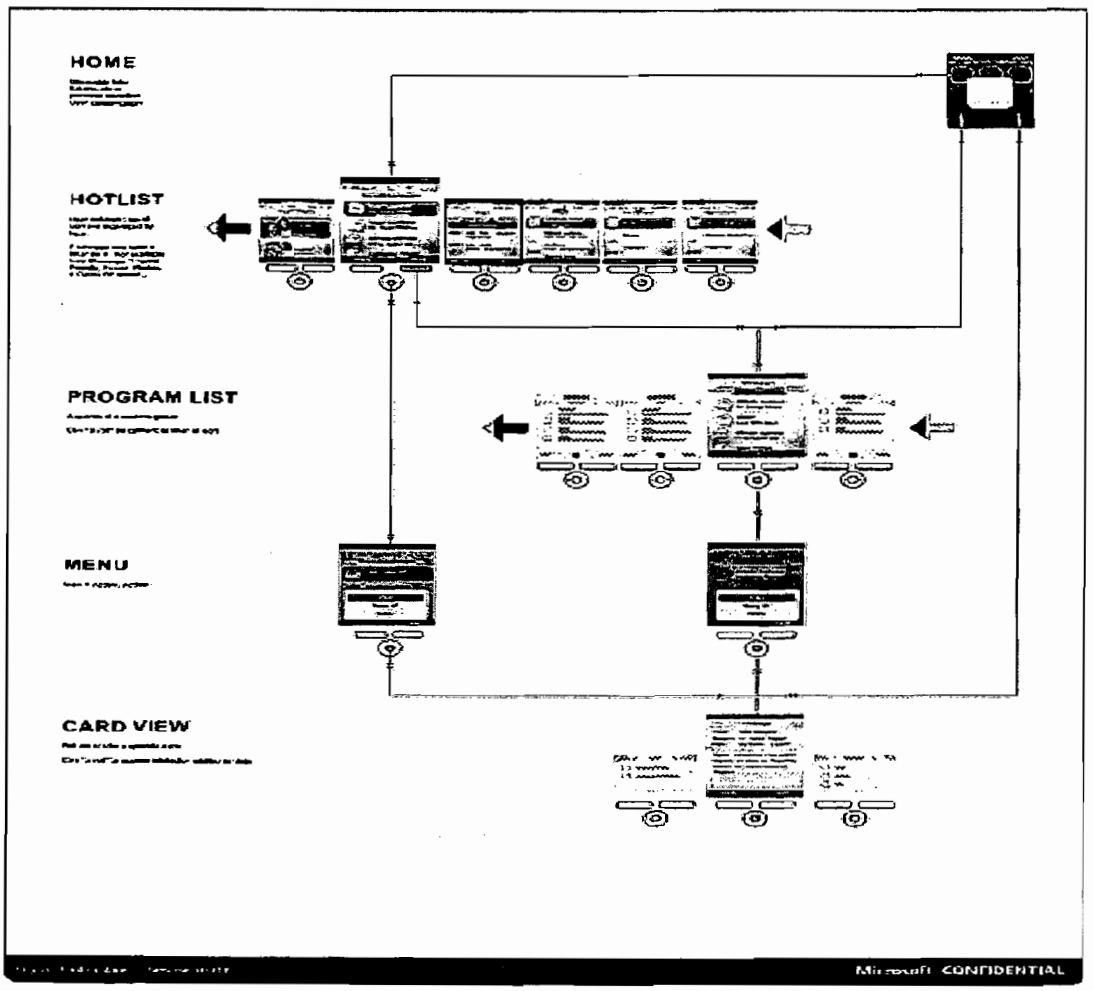

HOME
HOTLIST
PROGRAM LIST
MENU
CARD VIEW
Microsoft CONFIDENTIAL

FIG. 1


200
People
Catherine Miconi
Home: (718) 555 0186
View Contact
Send Email
Send SMS
Call Mobile
Close

FIG. 2


300
302
304
306
12:40
Contacts
Work
All
Recer
Alfredo Espinosa
Carol Philips
Catherine Miconi
Kate Taneyhill
All
Recent
Work
My People
Close
Call Mobile
Send SMS
View Contact
Send Email
Send SMS
Call Mobile
Send SMS

FIG. 3

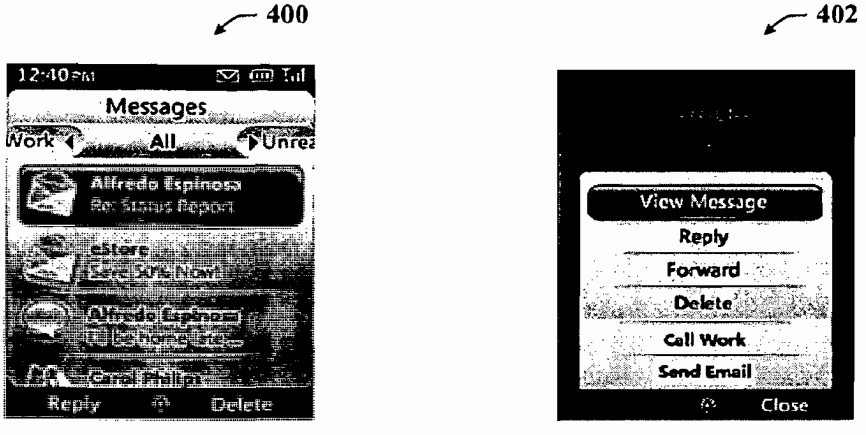

400
402
12:40PM
Messages
Work
All
Alfredo Espinosa
Reply
Delete
View Message
Reply
Forward
Delete
Call Work
Send Email
Close

FIG. 4

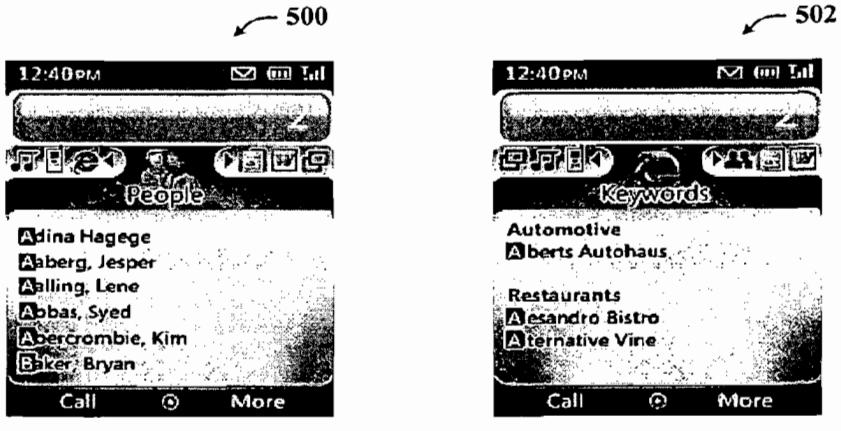

500
12:40PM
People
Adina Hagege
Aaberg, Jesper
Aalling, Lene
Abbas, Syed
Abercrombie, Kim
Baker, Bryan
Call
More
502
12:40PM
Keywords
Automotive
Aberts Autohaus
Restaurants
Alessandro Bistro
Alternative Vine
Call
More

FIG. 5


600
12:40 PM
People
Catherine Miconi
Home: (718) 555 0186
Alfredo Espinosa
SMS: (425) 555 1234
My Team
Email: myteam@cont
Thomas Axen
Call Home
More

FIG. 6

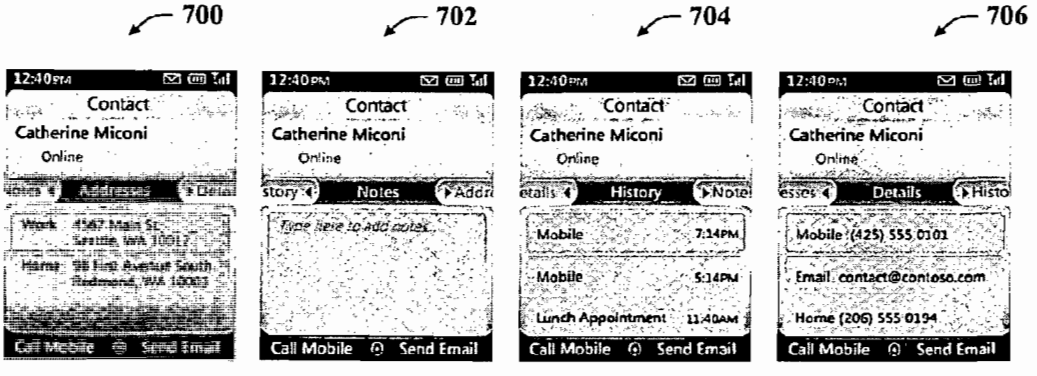

700
702
704
706
12:40PM
Contact
Catherine Miconi
Online
Addresses
Work
Home
Call Mobile
Send Email
Notes
Type here to add notes...
History
Mobile
7:14PM
Mobile
5:14PM
Lunch Appointment
11:40AM
Details
Mobile (425) 555 0101
Email contact@contoso.com
Home (206) 555 0194

FIG. 7

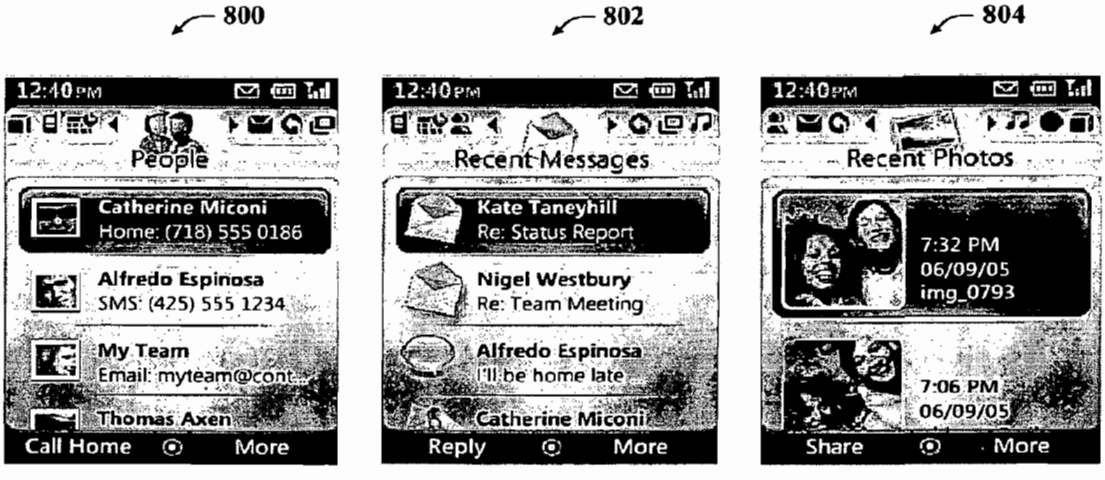

800
802
804
12:40PM
People
Catherine Miconi
Home: (718) 555 0186
Alfredo Espinosa
SMS: (425) 555 1234
My Team
Email: myteam@cont...
Thomas Axen
Call Home
More
12:40PM
Recent Messages
Kate Taneyhill
Re: Status Report
Nigel Westbury
Re: Team Meeting
Alfredo Espinosa
I'll be home late
Catherine Miconi
Reply
More
12:40PM
Recent Photos
7:32 PM
06/09/05
img_0793
7:06 PM
06/09/05
Share
More

FIG. 8

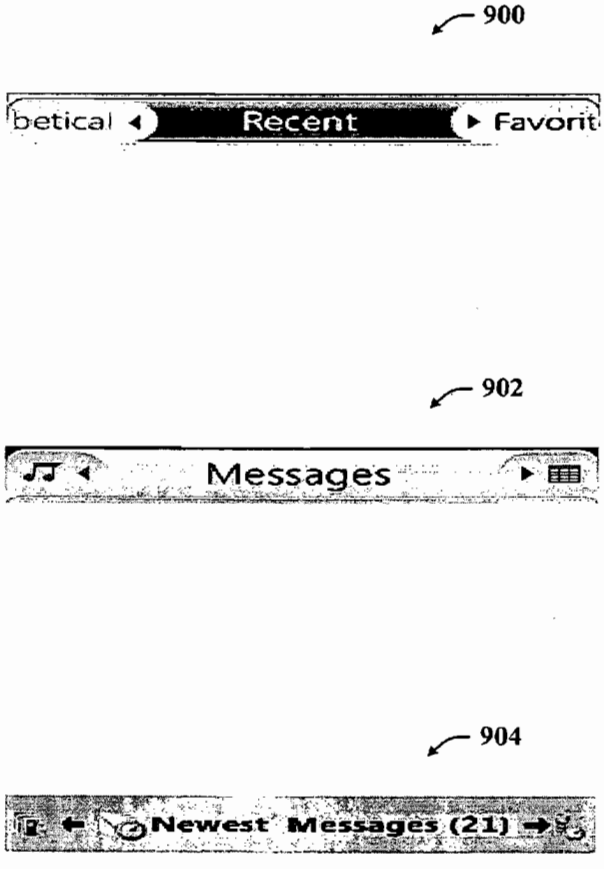

900
betical
Recent
Favorit
902
Messages
904
Newest Messages (21)

FIG. 9

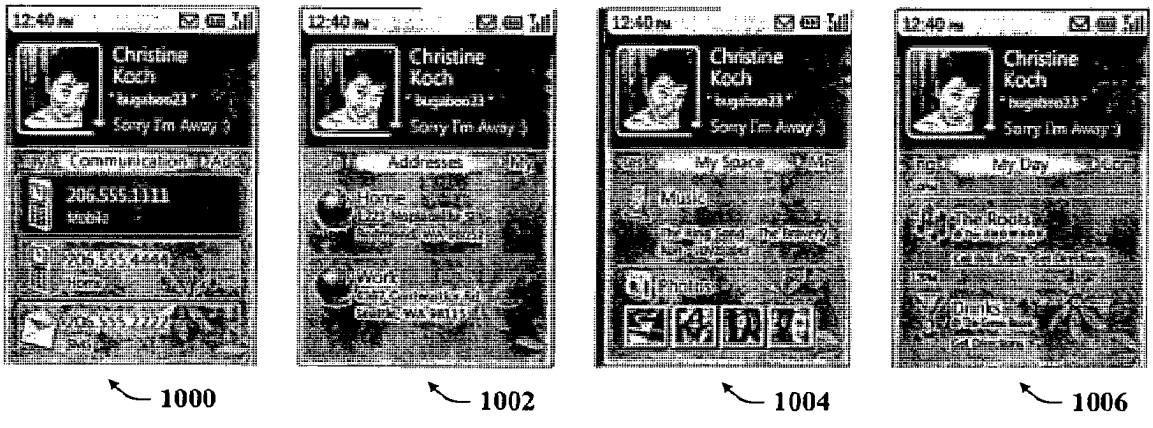

Christine Koch
Sorry I'm Away :)
206.555.1111
Addresses
My Space
My Day
1000
1002
1004
1006

FIG. 10

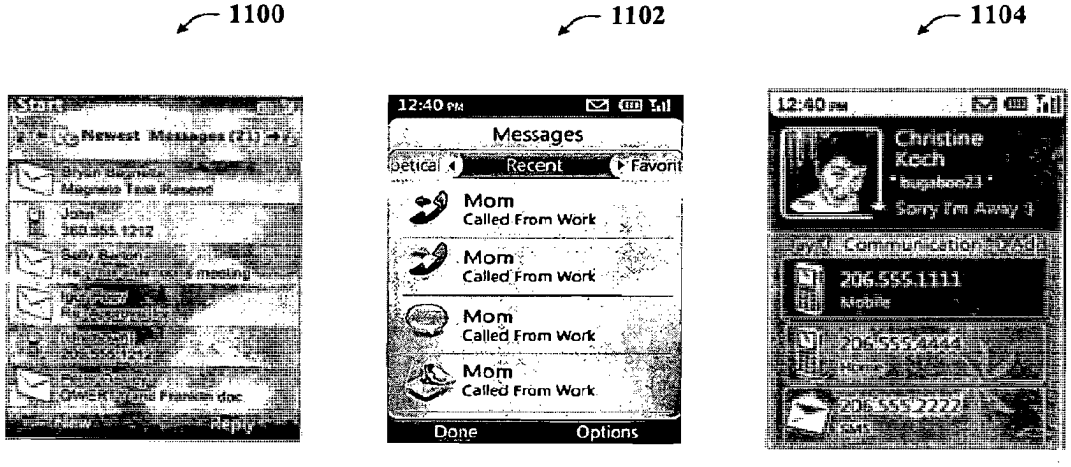

1100
1102
1104
Newest Messages (21)
Reply
12:40 PM
Messages
Recent
Mom
Called From Work
Mom
Called From Work
Mom
Called From Work
Mom
Called From Work
Done
Options
12:40 PM
Christine
Koch
Sorry I'm Away
206.555.1111
Mobile

FIG. 11

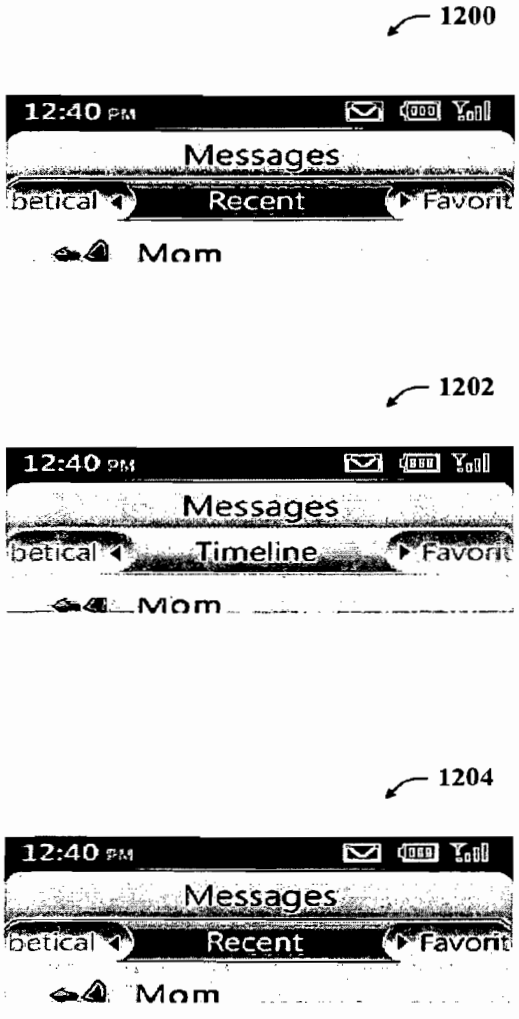

1200
12:40 PM
Messages
betical
Recent
Favorit
Mom
1202
12:40 PM
Messages
betical
Timeline
Favorit
Mom
1204
12:40 PM
Messages
betical
Recent
Favorit
Mom

FIG. 12


1300
1302
1304
12:40 PM
Messages
Mom
Called From Work
Mom
Called From Work
Mom
Called From Work
Mom
Called From Work
Mom
Called From Work
12:40 PM
Messages
Timeline
Deck Project
4.05.05
12:40 PM
Pictures
All
fun day

FIG. 13

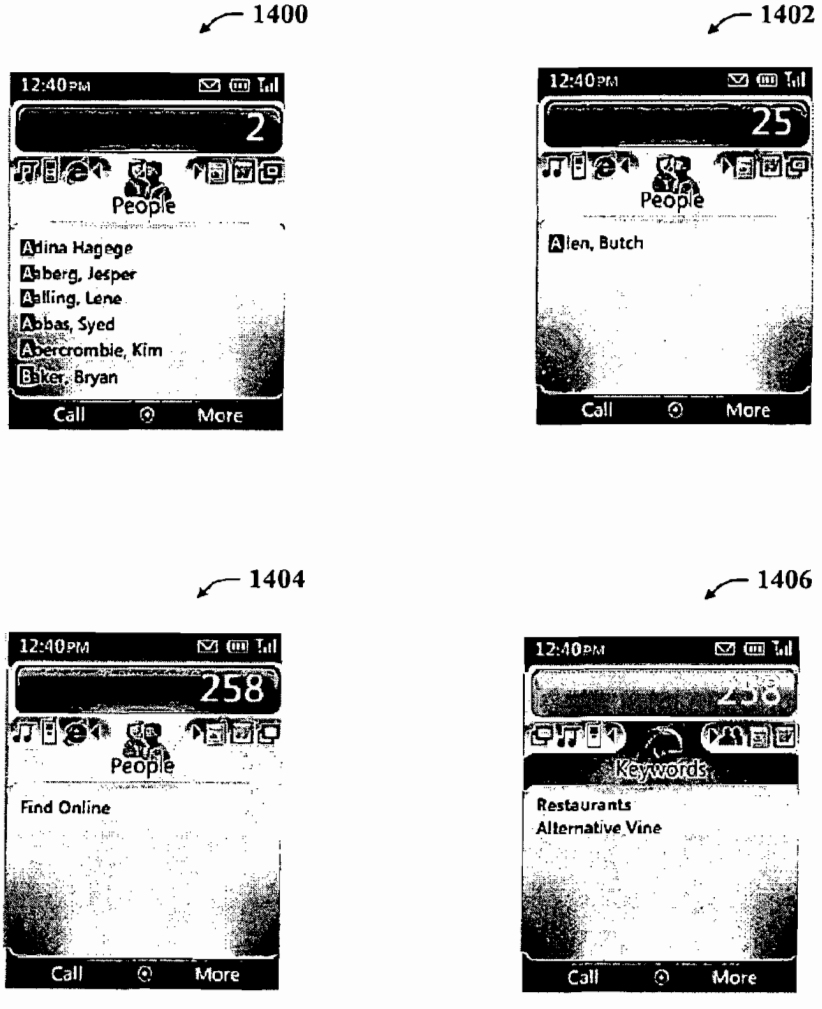

1400
12:40PM
2
People
Alina Hagege
Alberg, Jesper
Aalling, Lene
Abbas, Syed
Abercrombie, Kim
Baker, Bryan
Call
More
1402
12:40PM
25
People
Allen, Butch
Call
More
1404
12:40PM
258
People
Find Online
Call
More
1406
12:40PM
Keywords
Restaurants
Alternative Vine
Call
More

FIG. 14

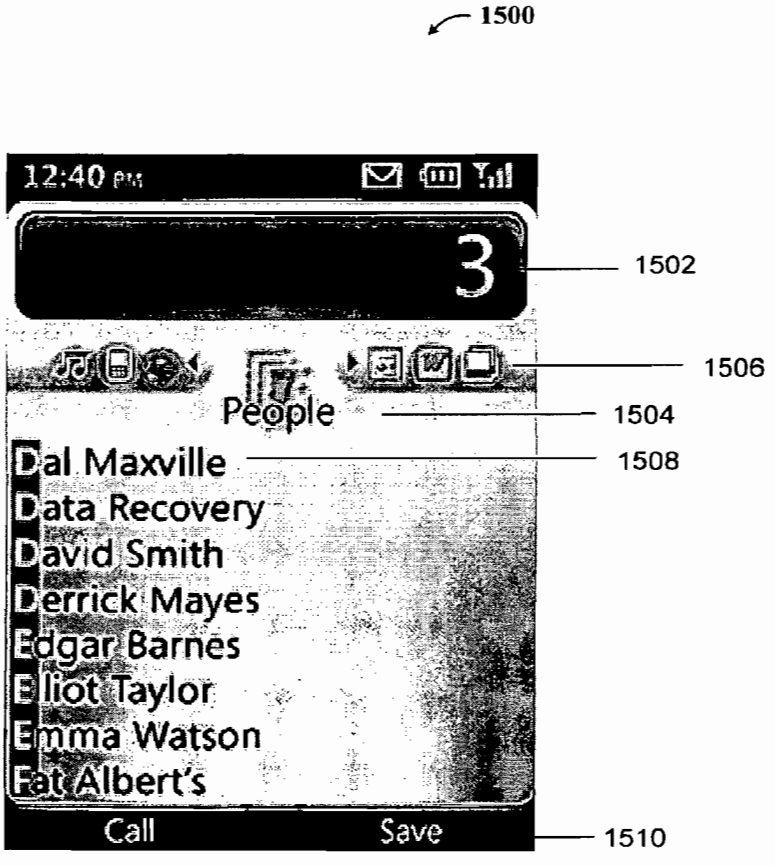

1500
12:40 PM
3
1502
1506
People
1504
Dal Maxville
1508
Data Recovery
David Smith
Derrick Mayes
Edgar Barnes
Eliot Taylor
Emma Watson
Fat Albert's
Call
Save
1510

FIG. 15

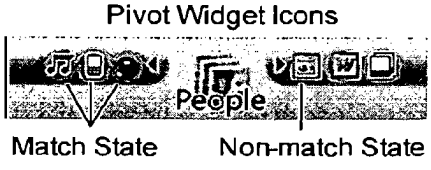


FIG. 16

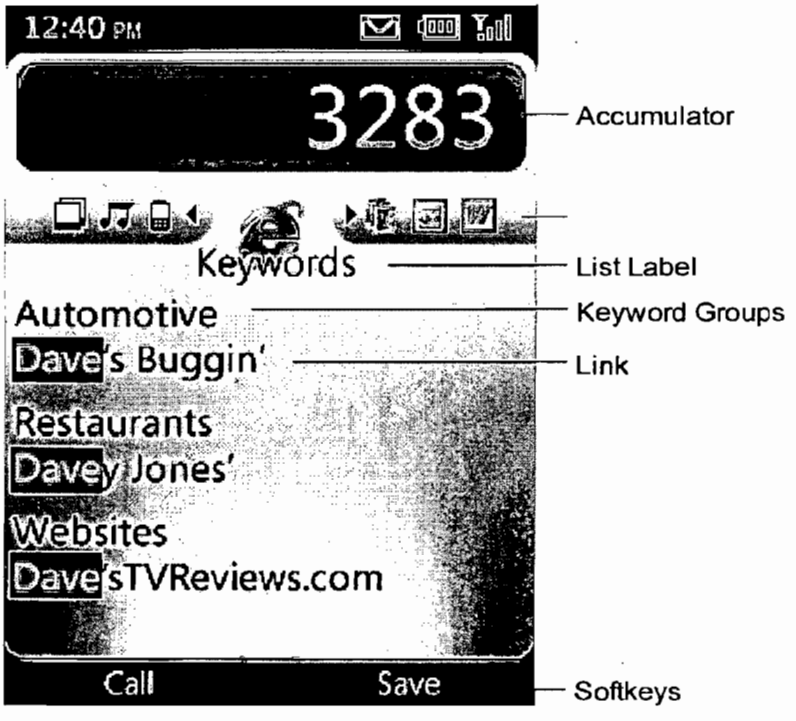

12:40 PM
3283
Accumulator
Keywords
List Label
Automotive
Keyword Groups
Dave's Buggin'
Link
Restaurants
Davey Jones'
Websites
DavesTVReviews.com
Call
Save
Softkeys

FIG. 17

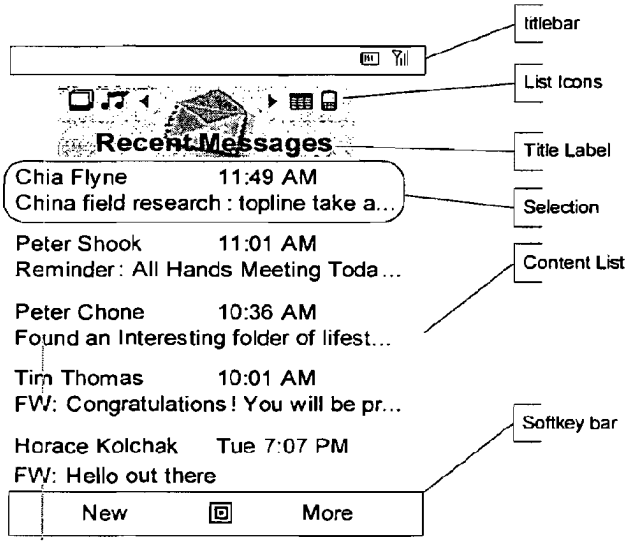

titlebar
List Icons
Recent Messages
Title Label
Chia Flyne 11:49 AM
China field research : topline take a...
Selection
Peter Shook 11:01 AM
Reminder: All Hands Meeting Toda...
Content List
Peter Chone 10:36 AM
Found an Interesting folder of lifest...
Tim Thomas 10:01 AM
FW: Congratulations! You will be pr...
Horace Kolchak Tue 7:07 PM
FW: Hello out there
Softkey bar
New
More

FIG. 18

FIG. 19


12:40 PM
Today
5.18.05
Lunch
Dahlia Lounge
Meet Franz
Blanco Coffee Shop
4 30 Early Movie
Town Square
1 Missed Call
3 New Emails
Seattle 65°
AM
NOON
PM

FIG. 20

FIG. 21

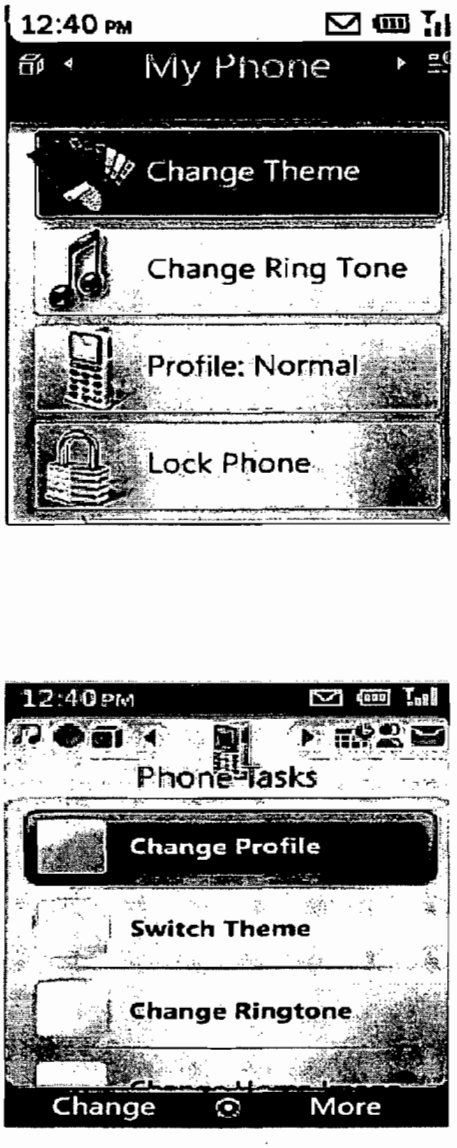

12:40 PM
My Phone
Change Theme
Change Ring Tone
Profile: Normal
Lock Phone
12:40 PM
Phone Tasks
Change Profile
Switch Theme
Change Ringtone
Change
More

FIG. 22


12:40 PM
Messages
RECENT
Sidney Higa
Hey, are you going tonight?
Mom
Called from Home
Overstock.com
RE: Recent Order
Amazon.com
Save 15% on 'Phantoms'

FIG. 23


12:40 PM
History
RECENT
Jacky Chen
Called Mobile
Matt Hink
Called from Mobile
Unknown Caller
425.705.9472
Overstock.com
Recent Order

FIG. 24

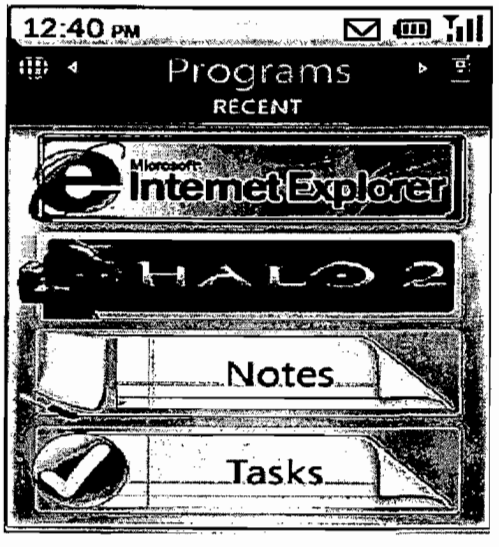

12:40 PM
Programs
RECENT
Microsoft Internet Explorer
HALO 2
Notes
Tasks

FIG. 25


12:40 PM
Music
RECENT
Mood: Workout
Currently playing
Kelly Clarkson
Breakaway
Gwen Stafani
Love Angel Music Baby
Roxy's Workout Mix
Created May 12th, 2005

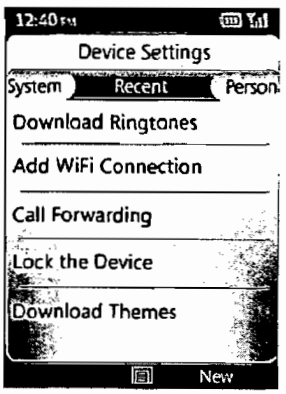
FIG. 26

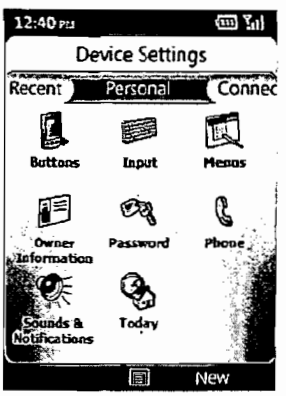

12:40 PM
Pictures
RECENT
Yellowflower
Taken on 05.7.05 at the Arboretum

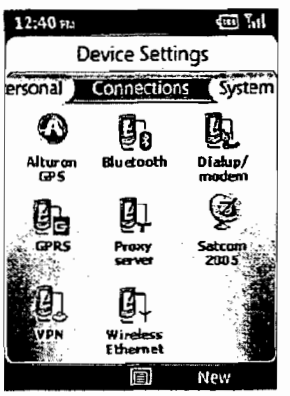
FIG. 27

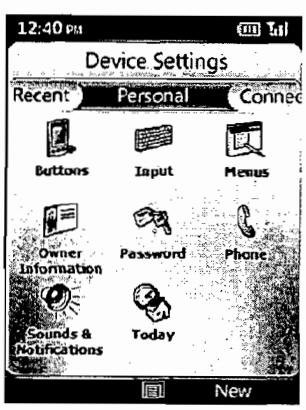

12:40 PM
Orange World
Orange World Mobile Services
orange
Explore Orange
Make your life easier
A World of Fun
Music, games & ringtones
A World of Info
Get the latest headlines
A World of Tools
Check, find, translate

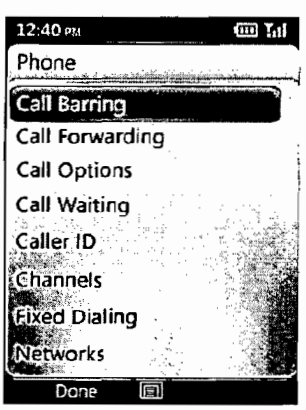
FIG. 28


12:40
Device Settings
System
Recent
Person
Download Ringtones
Add WiFi Connection
Call Forwarding
Lock the Device
Download Themes
New


12:40
Device Settings
Recent
Personal
Connec
Buttons
Input
Menus
Owner Information
Password
Phone
Sounds & Notifications
Today
New


12:40
Device Settings
ersonal
Connections
System
Alltuon GPS
Bluetooth
Dialup/ modem
GPRS
Proxy server
Satcom 2005
VPN
Wireless Ethernet
New


12:40
Device Settings
Recent
Personal
Connec
Buttons
Input
Menus
Owner Information
Password
Phone
Sounds & Notifications
Today
New


12:40
Phone
Call Barring
Call Forwarding
Call Options
Call Waiting
Caller ID
Channels
Fixed Dialing
Networks
Done

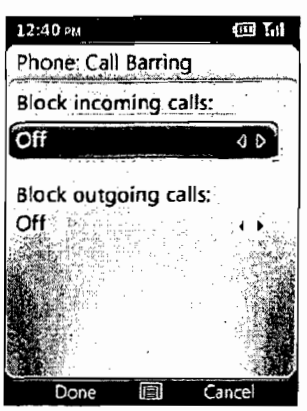

12:40
Phone: Call Barring
Block incoming calls:
Off
Block outgoing calls:
Off
Done
Cancel

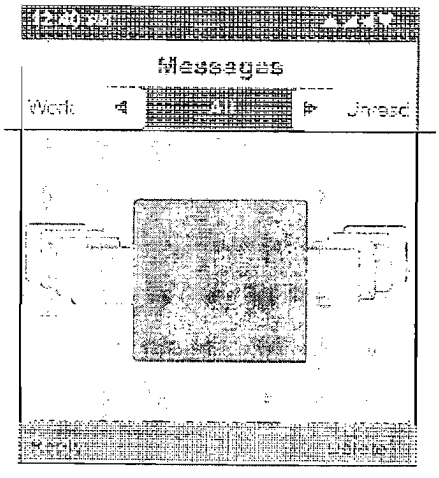
FIG. 29


12:40 PM
New Messages
Andrew
FW: status report 3/4/05
Dom
RE: Team Meeting
John
I'll be home late tonig...
Clare
Called from home
Reply
View More


12:40 PM
Pictures
RECENT
Yellowflower
Taken on 05.7.05 at the Arboretum


12:40 PM
Music
RECENT
Mood: Workout
Currently playing
Kelly Clarkson
Breakaway
Gwen Stafani
Love Angel Music Baby
Roxy's Workout Mix
Created May 12th, 2005

FIG. 30


Messages
Work
Unread

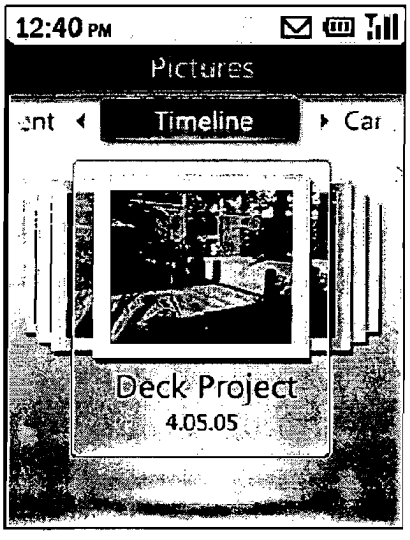
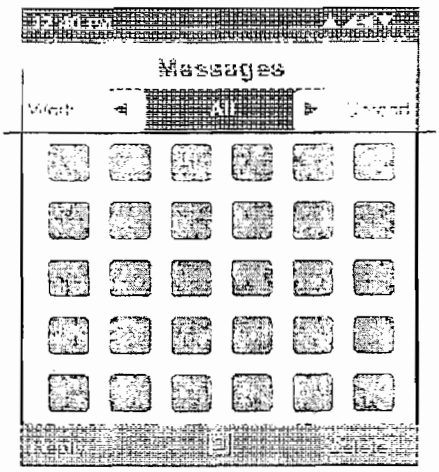

12:40 PM
Pictures
Timeline
Car
Deck Project
4.05.05

FIG. 31


Messages
All


12:40 PM
Calendar
All
May 15-21
S M T W T F S
15 16 17 18 19 20 21

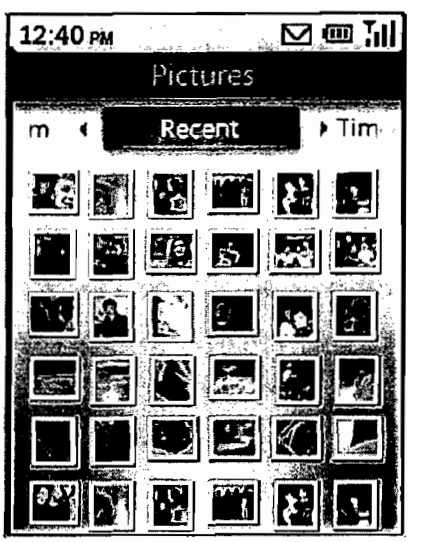
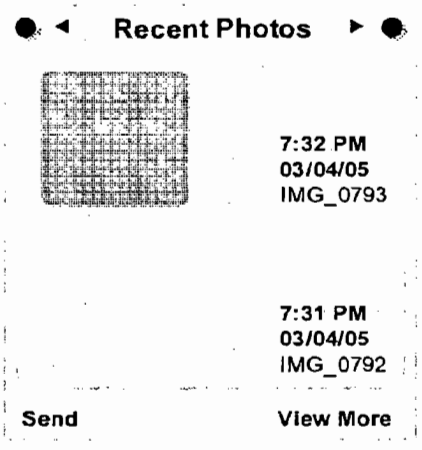

12:40 PM
Pictures
Recent

FIG. 32


Recent Photos
7:32 PM
03/04/05
IMG_0793
7:31 PM
03/04/05
IMG_0792
Send
View More


12:40 PM
Christine
Koch
" bugaboo23 "
Sorry I'm Away :)
My Space
Music
The Ring Song - The Bravery
Ron - Joyzipper
Photos

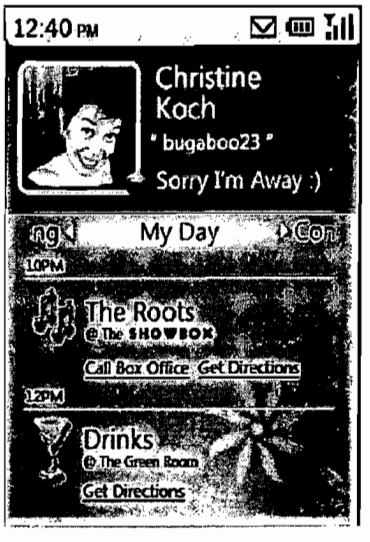
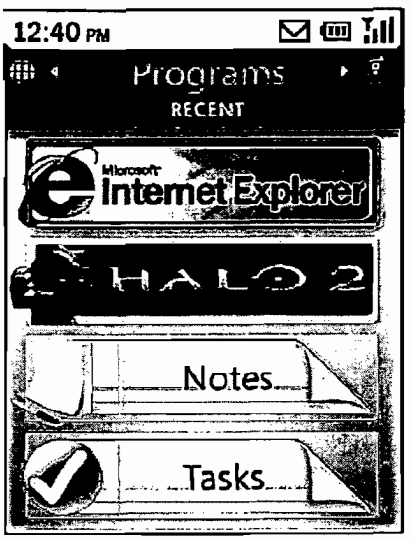

12:40 PM
Christine
Koch
" bugaboo23 "
Sorry I'm Away :)
My Day
10PM
The Roots
@ The SHOWBOX
Call Box Office Get Directions
12PM
Drinks
@ The Green Room
Get Directions

FIG. 33

FIG. 34


12:40 PM
Programs
RECENT
Internet Explorer
HALO 2
Notes
Tasks


12:40 PM
Christine Koch
" bugaboo23 "
Sorry I'm Away :)
Communication
206.555.1111
Mobile
206.555.4444
Home
206.555.2222
SMS


12:40 PM
Christine Koch
" bugaboo23 "
Sorry I'm Away :)
My Space
Music
The Ring Song - The Bravery
Ron - Joyzipper
Photos

FIG. 35

FIG. 36

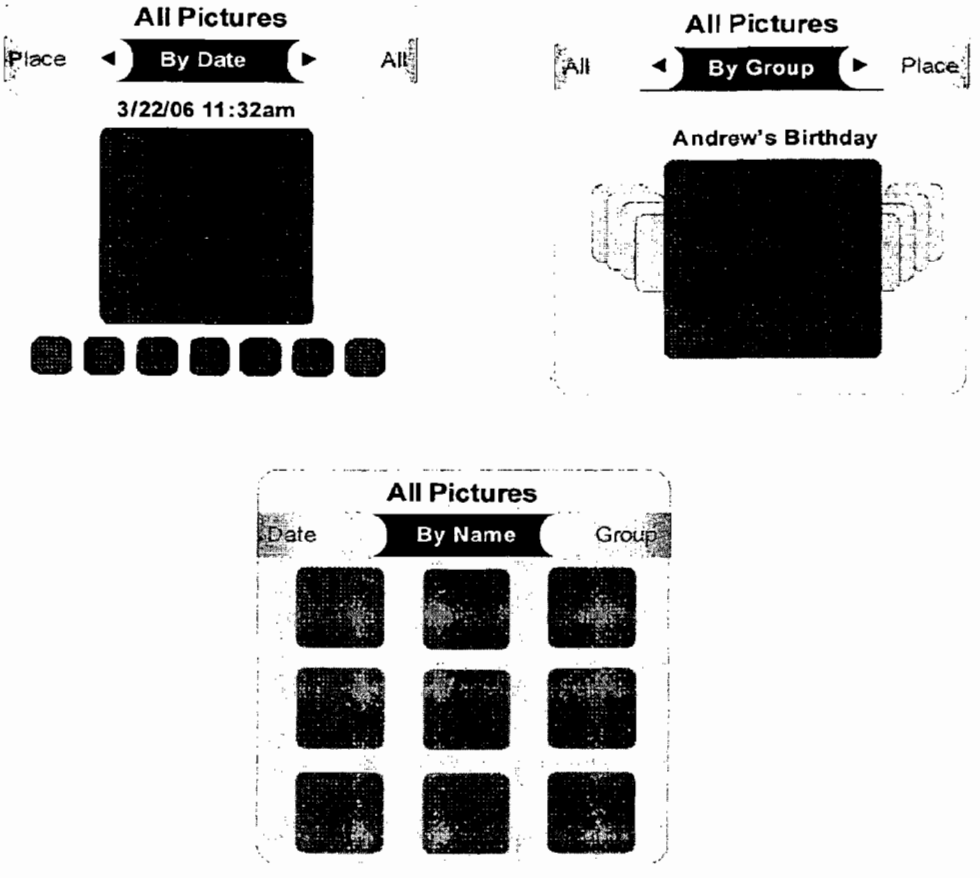
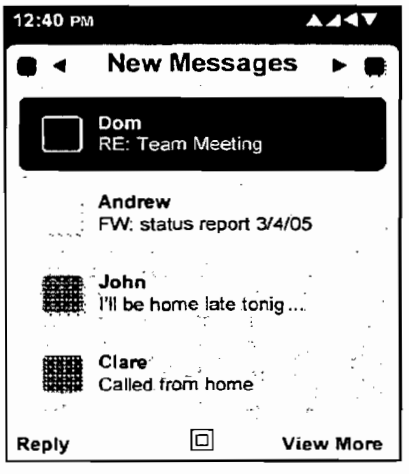
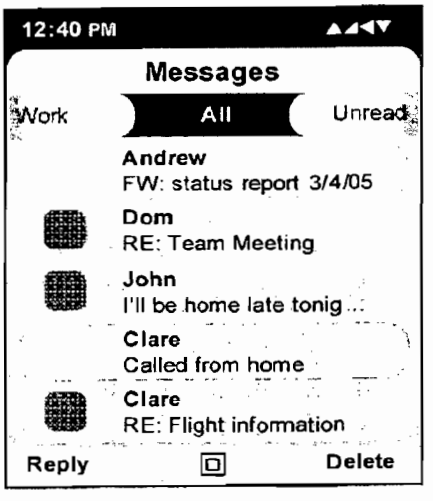

All Pictures
Place
By Date
All
3/22/06 11:32am
All Pictures
All
By Group
Place
Andrew's Birthday
All Pictures
Date
By Name
Group
All Pictures
All
By Group
Place
Andrew's Bday
AP3220601
AP3220602
AP3220603
AP3220604
All Pictures
All
By Group
Place
Andrew's Birthday
AP3220601 .jpg
768 kb
AP3220602 .jpg
768 kb
AP3220603 .jpg
768 kb
AP3220604 .jpg
768 kb

FIG. 37


12:40 PM
New Messages
Dom
RE: Team Meeting
Andrew
FW: status report 3/4/05
John
I'll be home late tonig...
Clare
Called from home
Reply
View More


12:40 PM
Messages
Work
All
Unread
Andrew
FW: status report 3/4/05
Dom
RE: Team Meeting
John
I'll be home late tonig...
Clare
Called from home
Clare
RE: Flight information
Reply
Delete


12:40 PM
Recent
Fun Day


Who would you like to share this wit
Alpha
VIPs
Recent

FIG. 38

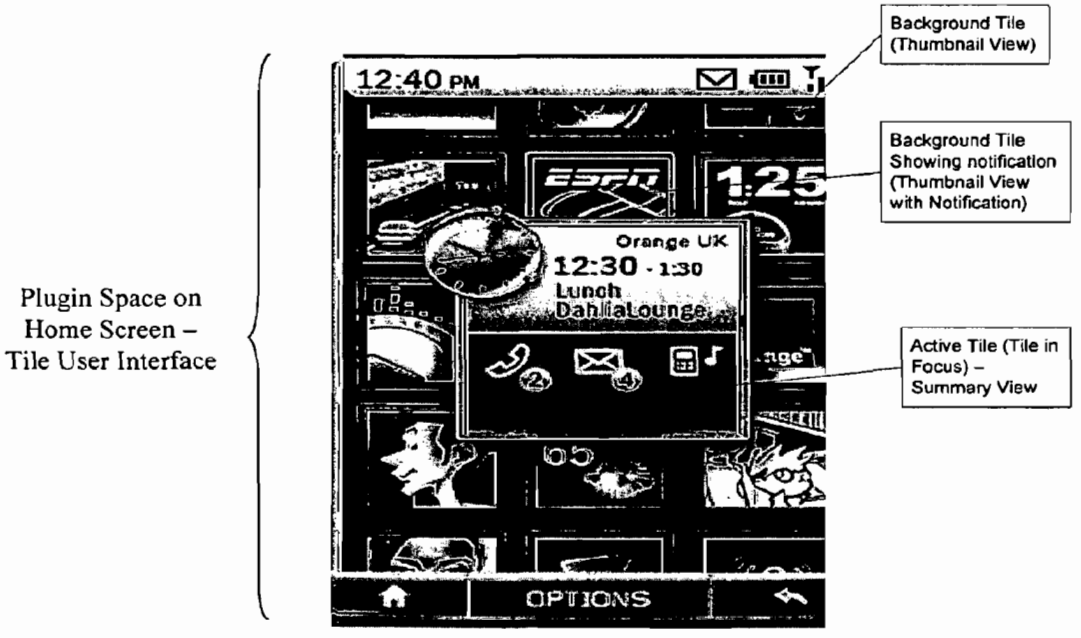

Plugin Space on Home Screen – Tile User Interface
12:40 PM
Orange UK
12:30 - 1:30
Lunch
DahliaLounge
OPTIONS
Background Tile (Thumbnail View)
Background Tile Showing notification (Thumbnail View with Notification)
Active Tile (Tile in Focus) – Summary View

FIG. 39

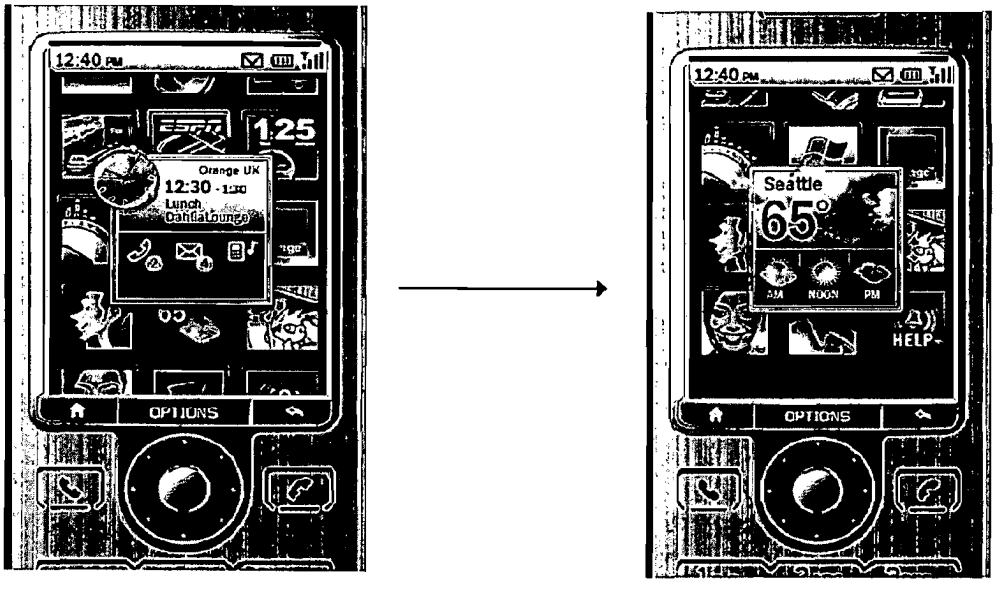

12:40 PM
1:25
Orange UK
12:30 - 1:30
Lunch
CahfeLounge
OPTIONS
12:40 PM
Seattle
65°
AM
NOON
PM
HELP
OPTIONS

FIG. 40

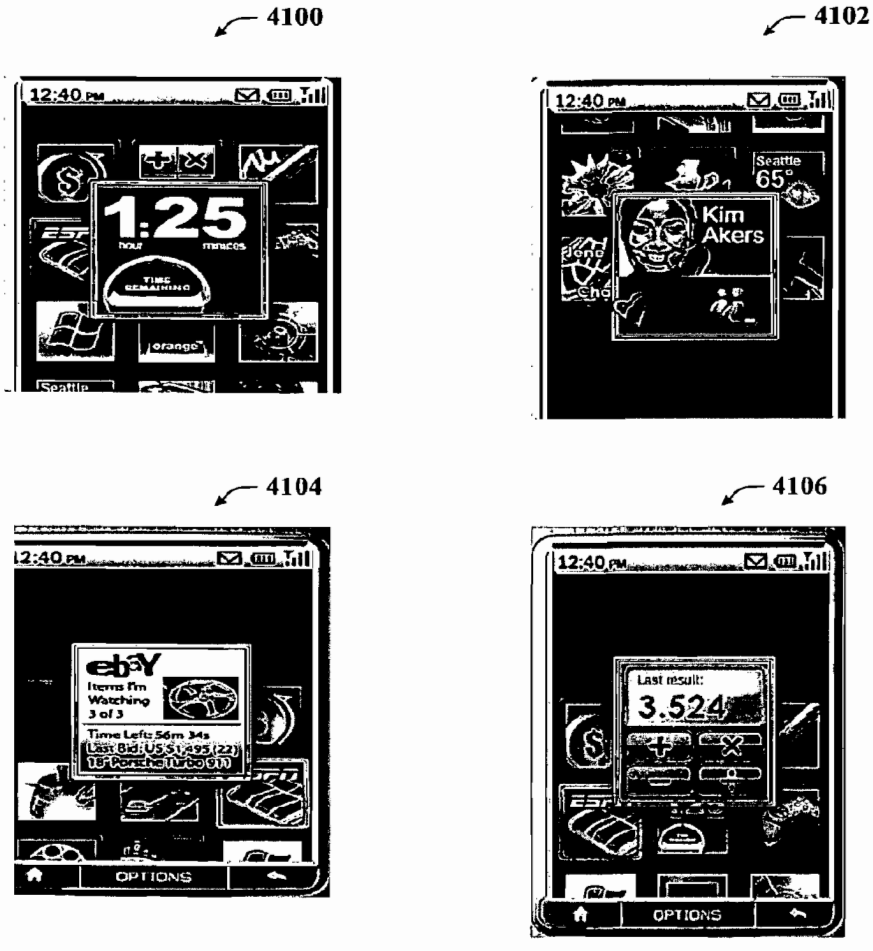

4100
4102
4104
4106
12:40 PM
1:25
hour
minutes
TIME REMAINING
orange
Seattle
65°
Kim
Akers
ebay
Items I'm Watching
3 of 3
Time Left: 56m 34s
OPTIONS
Last result:
3.524

FIG. 41

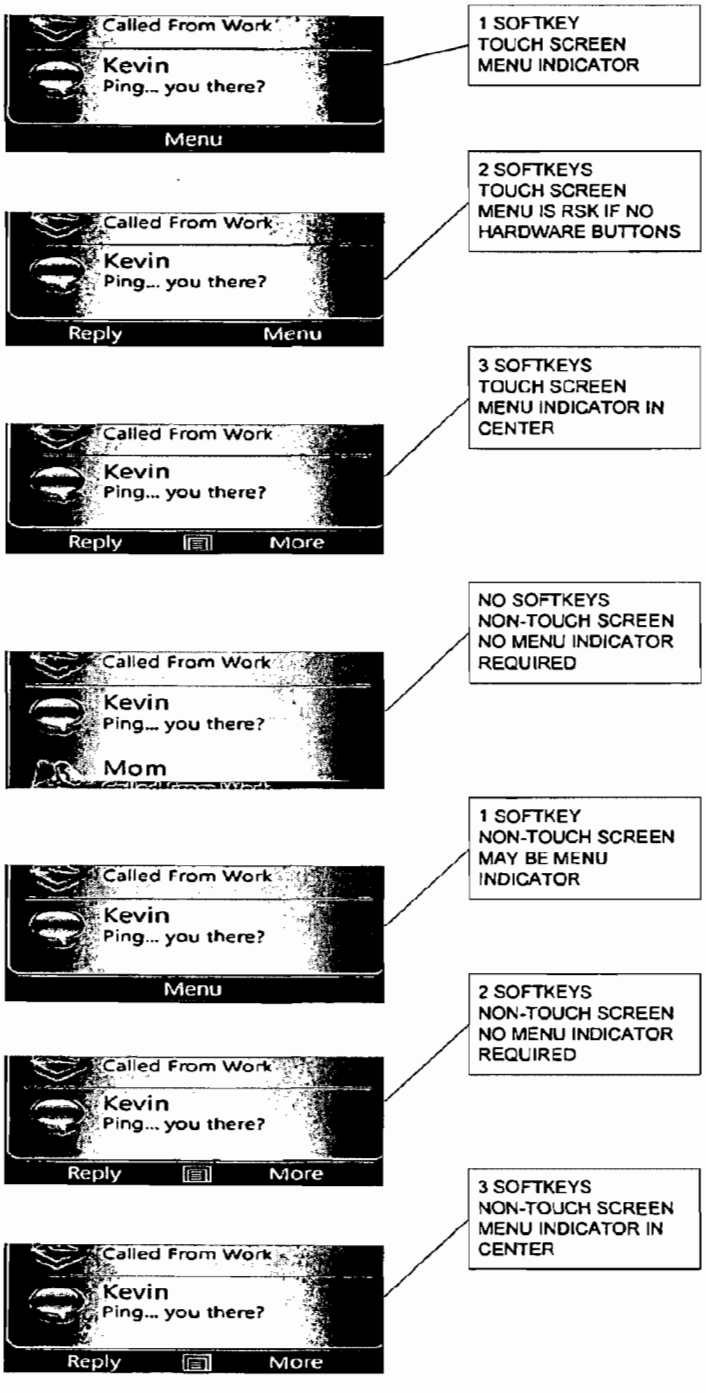

Called From Work
Kevin
Ping... you there?
Menu
1 SOFTKEY
TOUCH SCREEN
MENU INDICATOR
Called From Work
Kevin
Ping... you there?
Reply
Menu
2 SOFTKEYS
TOUCH SCREEN
MENU IS RSK IF NO
HARDWARE BUTTONS
Called From Work
Kevin
Ping... you there?
Reply
More
3 SOFTKEYS
TOUCH SCREEN
MENU INDICATOR IN
CENTER
Called From Work
Kevin
Ping... you there?
Mom
NO SOFTKEYS
NON-TOUCH SCREEN
NO MENU INDICATOR
REQUIRED
Called From Work
Kevin
Ping... you there?
Menu
1 SOFTKEY
NON-TOUCH SCREEN
MAY BE MENU
INDICATOR
Called From Work
Kevin
Ping... you there?
Reply
More
2 SOFTKEYS
NON-TOUCH SCREEN
NO MENU INDICATOR
REQUIRED
Called From Work
Kevin
Ping... you there?
Reply
More
3 SOFTKEYS
NON-TOUCH SCREEN
MENU INDICATOR IN
CENTER

FIG. 42

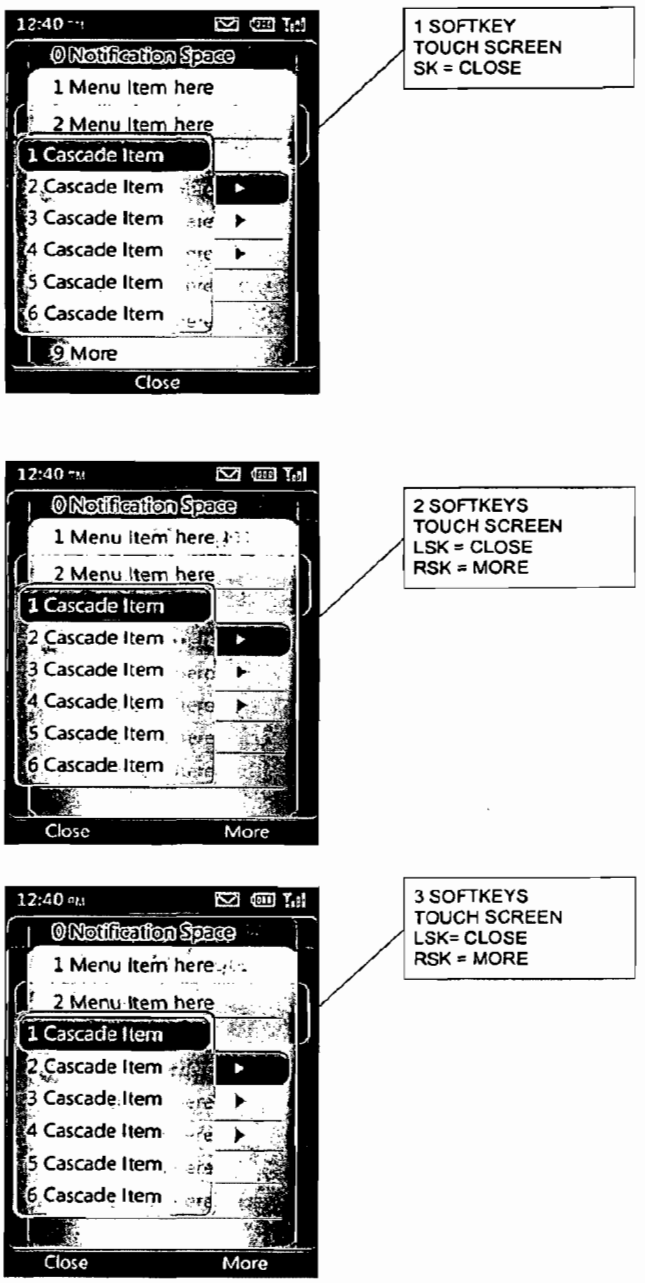

12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
1 Cascade Item
2 Cascade Item
3 Cascade Item
4 Cascade Item
5 Cascade Item
6 Cascade Item
9 More
Close
1 SOFTKEY
TOUCH SCREEN
SK = CLOSE
12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
1 Cascade Item
2 Cascade Item
3 Cascade Item
4 Cascade Item
5 Cascade Item
6 Cascade Item
Close
More
2 SOFTKEYS
TOUCH SCREEN
LSK = CLOSE
RSK = MORE
12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
1 Cascade Item
2 Cascade Item
3 Cascade Item
4 Cascade Item
5 Cascade Item
6 Cascade Item
Close
More
3 SOFTKEYS
TOUCH SCREEN
LSK= CLOSE
RSK = MORE

FIG. 43

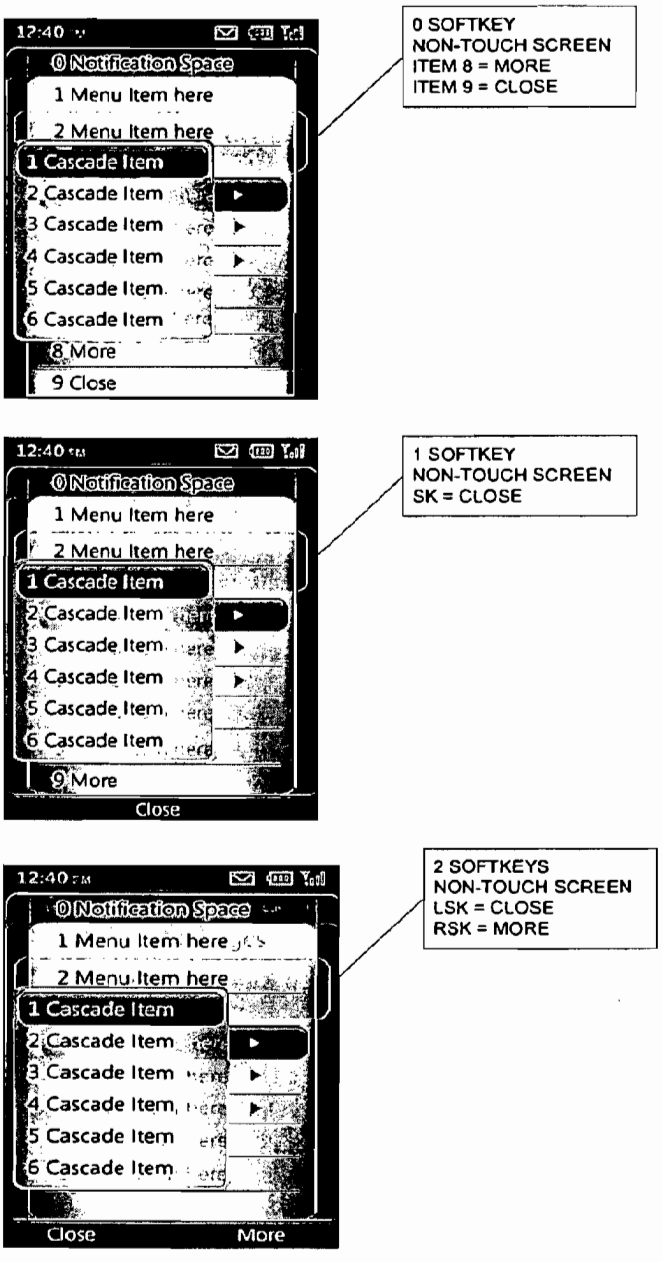

12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
1 Cascade Item
2 Cascade Item
3 Cascade Item
4 Cascade Item
5 Cascade Item
6 Cascade Item
8 More
9 Close
0 SOFTKEY
NON-TOUCH SCREEN
ITEM 8 = MORE
ITEM 9 = CLOSE
12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
1 Cascade Item
2 Cascade Item
3 Cascade Item
4 Cascade Item
5 Cascade Item
6 Cascade Item
9 More
Close
1 SOFTKEY
NON-TOUCH SCREEN
SK = CLOSE
12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
1 Cascade Item
2 Cascade Item
3 Cascade Item
4 Cascade Item
5 Cascade Item
6 Cascade Item
Close
More
2 SOFTKEYS
NON-TOUCH SCREEN
LSK = CLOSE
RSK = MORE

FIG. 44

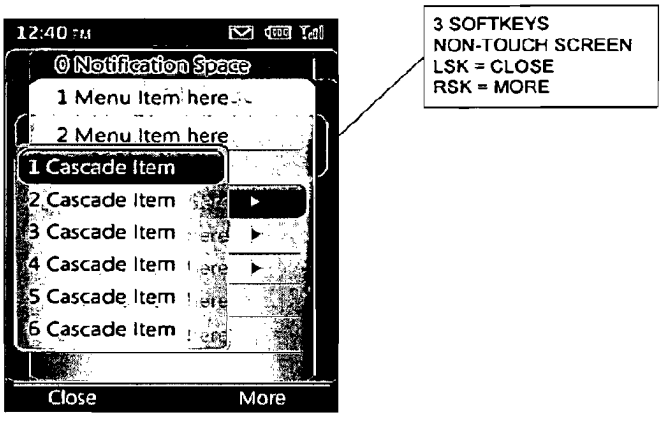
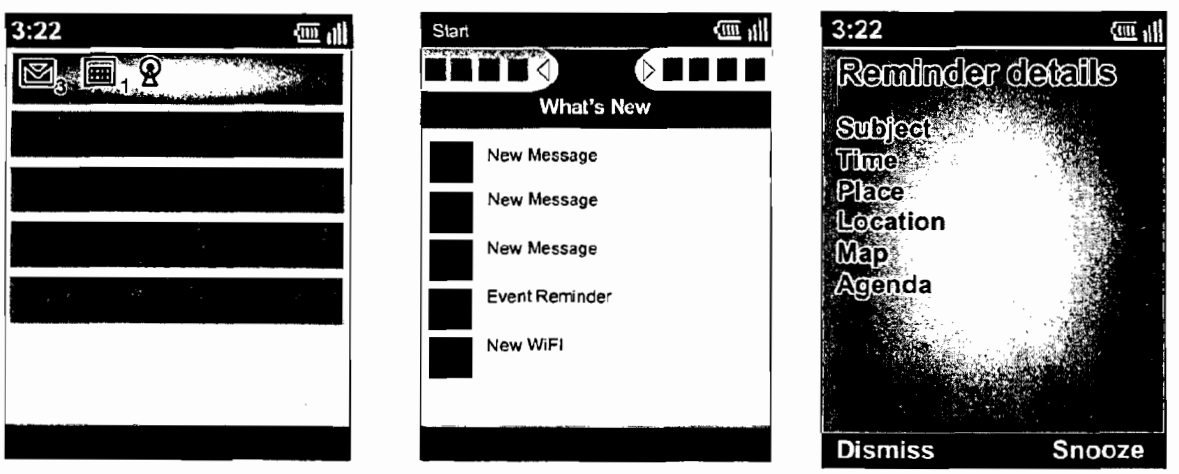

12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
1 Cascade Item
2 Cascade Item
3 Cascade Item
4 Cascade Item
5 Cascade Item
6 Cascade Item
Close
More
3 SOFTKEYS
NON-TOUCH SCREEN
LSK = CLOSE
RSK = MORE

FIG. 45


12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
3 Menu Item here
4 Menu Item here
5 Menu Item here
6 Menu Item here
7 Menu Item here
8 Menu Item here
9 Menu Item here
Close
More
12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
3 Menu Item here
4 Menu Item here
5 Menu Item here
6 Menu Item here
7 Menu Item here
8 Menu Item here
9 Menu Item here
Close
More
12:40
0 Notification Space
1 Menu Item here
2 Menu Item here
3 Menu Item here
Close
More

FIG. 46



ICON STATE LIST STATE DETAIL STATE

FIG. 47

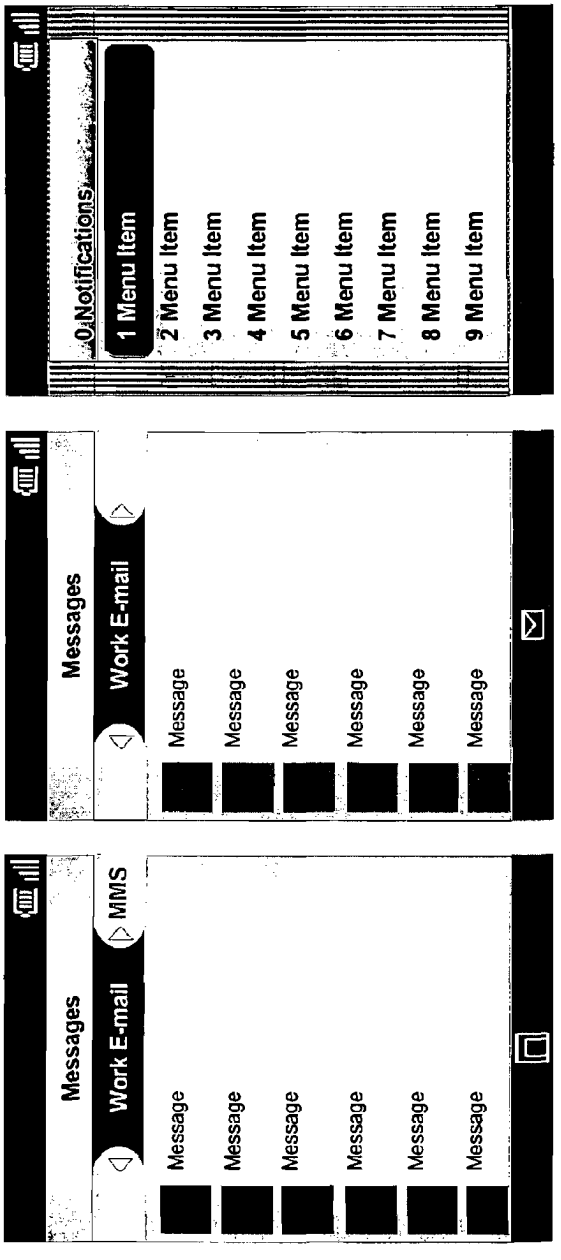

Messages
Work E-mail
MMS
Message
Messages
Work E-mail
Message
Notifications
1 Menu Item
2 Menu Item
3 Menu Item
4 Menu Item
5 Menu Item
6 Menu Item
7 Menu Item
8 Menu Item
9 Menu Item

FIG. 48

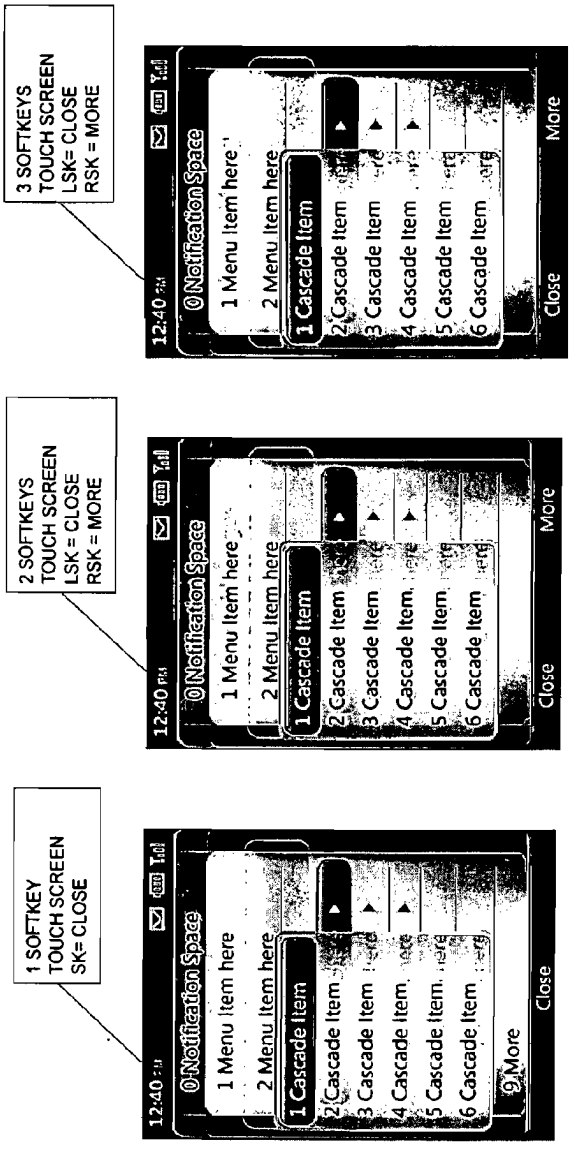

1 SOFTKEY
TOUCH SCREEN
SK= CLOSE
2 SOFTKEYS
TOUCH SCREEN
LSK = CLOSE
RSK = MORE
3 SOFTKEYS
TOUCH SCREEN
LSK= CLOSE
RSK = MORE
0 Notification Space
1 Menu Item here
2 Menu Item here
1 Cascade Item
2 Cascade Item
3 Cascade Item
4 Cascade Item
5 Cascade Item
6 Cascade Item
9 More
Close
More

FIG. 49

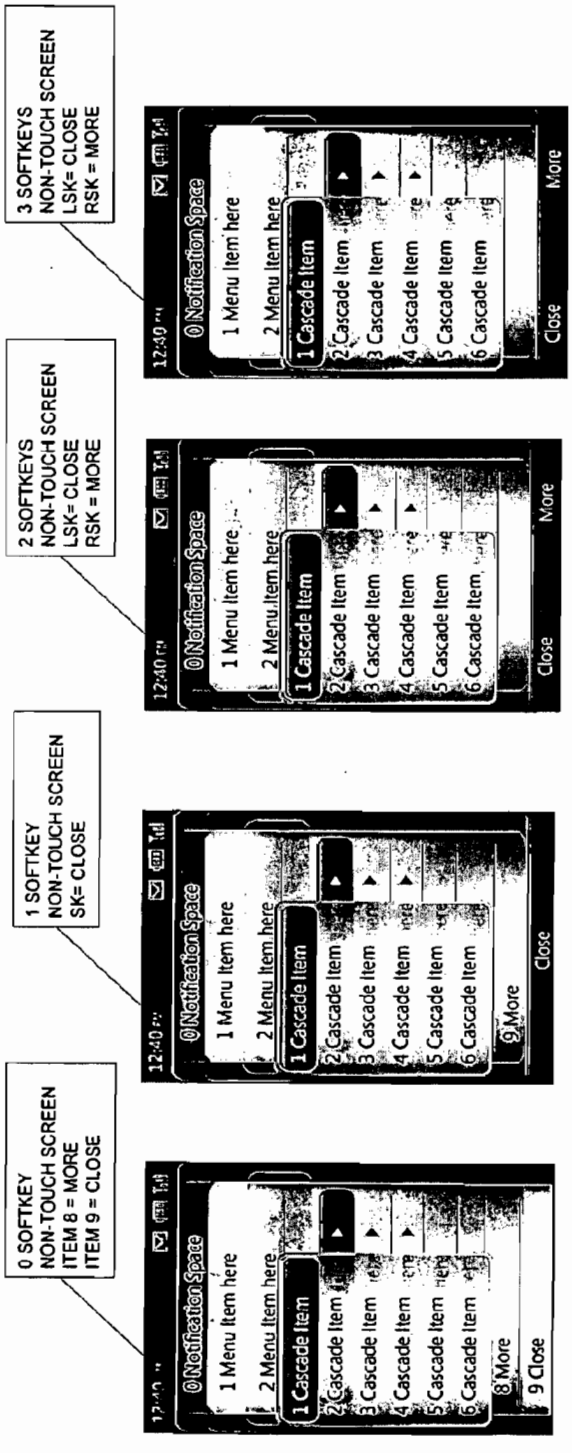

0 SOFTKEY
NON-TOUCH SCREEN
ITEM 8 = MORE
ITEM 9 = CLOSE
1 SOFTKEY
NON-TOUCH SCREEN
SK= CLOSE
2 SOFTKEYS
NON-TOUCH SCREEN
LSK= CLOSE
RSK = MORE
3 SOFTKEYS
NON-TOUCH SCREEN
LSK= CLOSE
RSK = MORE
0 Notification Space
1 Menu Item here
2 Menu Item here
1 Cascade Item
2 Cascade Item
3 Cascade Item
4 Cascade Item
5 Cascade Item
6 Cascade Item
8 More
9 Close
More
Close

FIG. 50


12:40 PM
0 Notification Space
1 Menu Item here
2 Menu Item here
3 Menu Item here
4 Menu Item here
5 Menu Item here
6 Menu Item here
7 Menu Item here
8 Menu Item here
9 Menu Item here
Close
More

FIG. 51

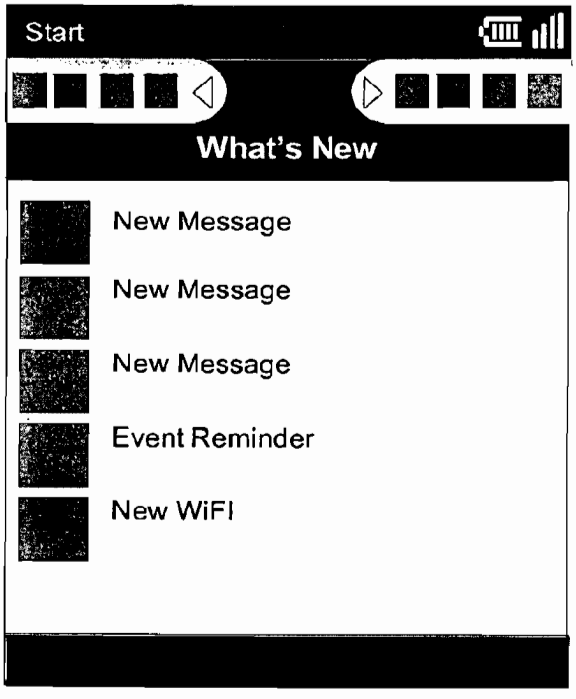

Start
What's New
New Message
New Message
New Message
Event Reminder
New WiFI

FIG. 52

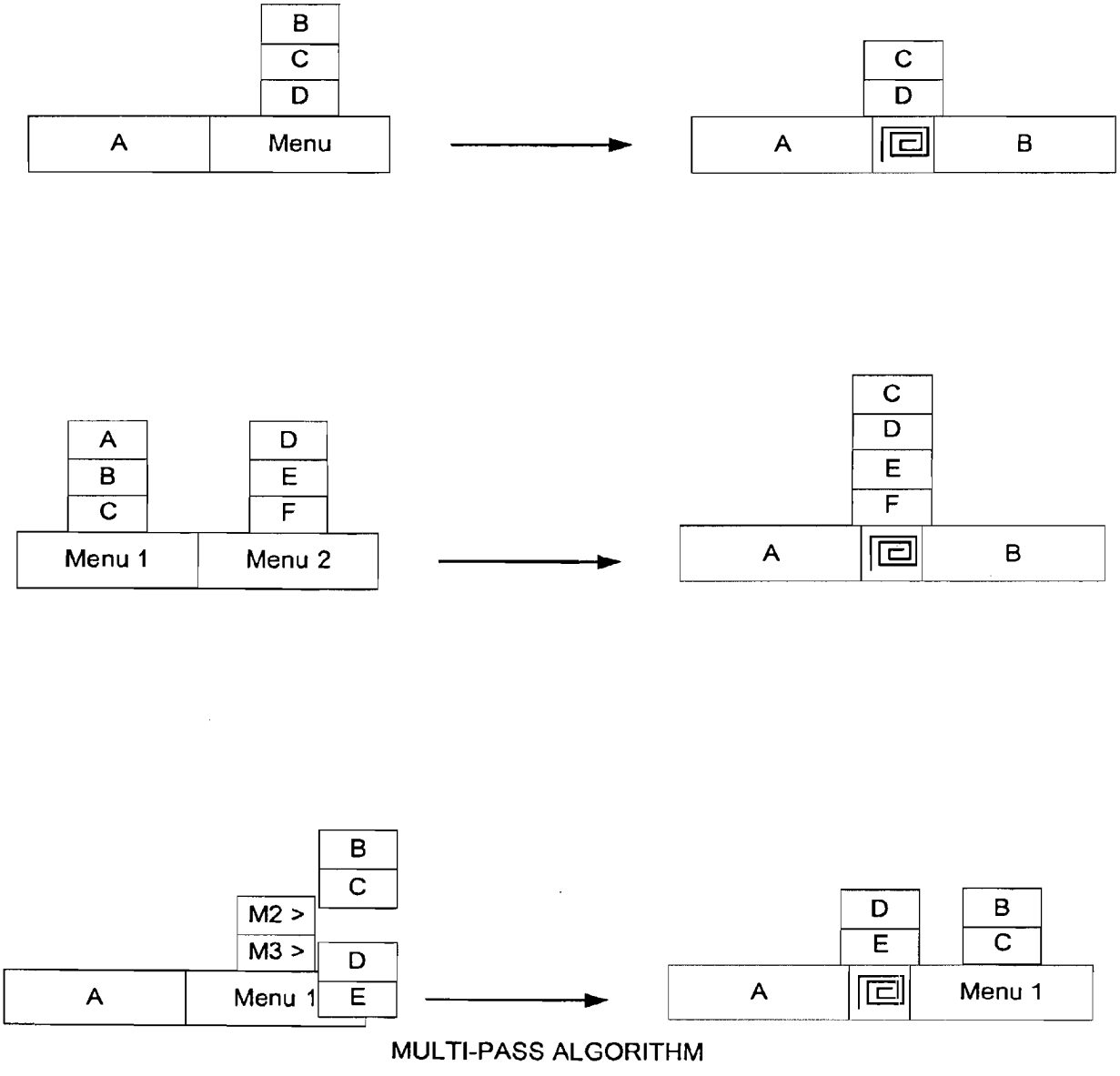

B
C
D
A
Menu
C
D
A
B
A
B
C
D
E
F
Menu 1
Menu 2
C
D
E
F
A
B
B
C
M2 >
M3 >
D
E
A
Menu 1
D
E
B
C
A
Menu 1
MULTI-PASS ALGORITHM

FIG. 53

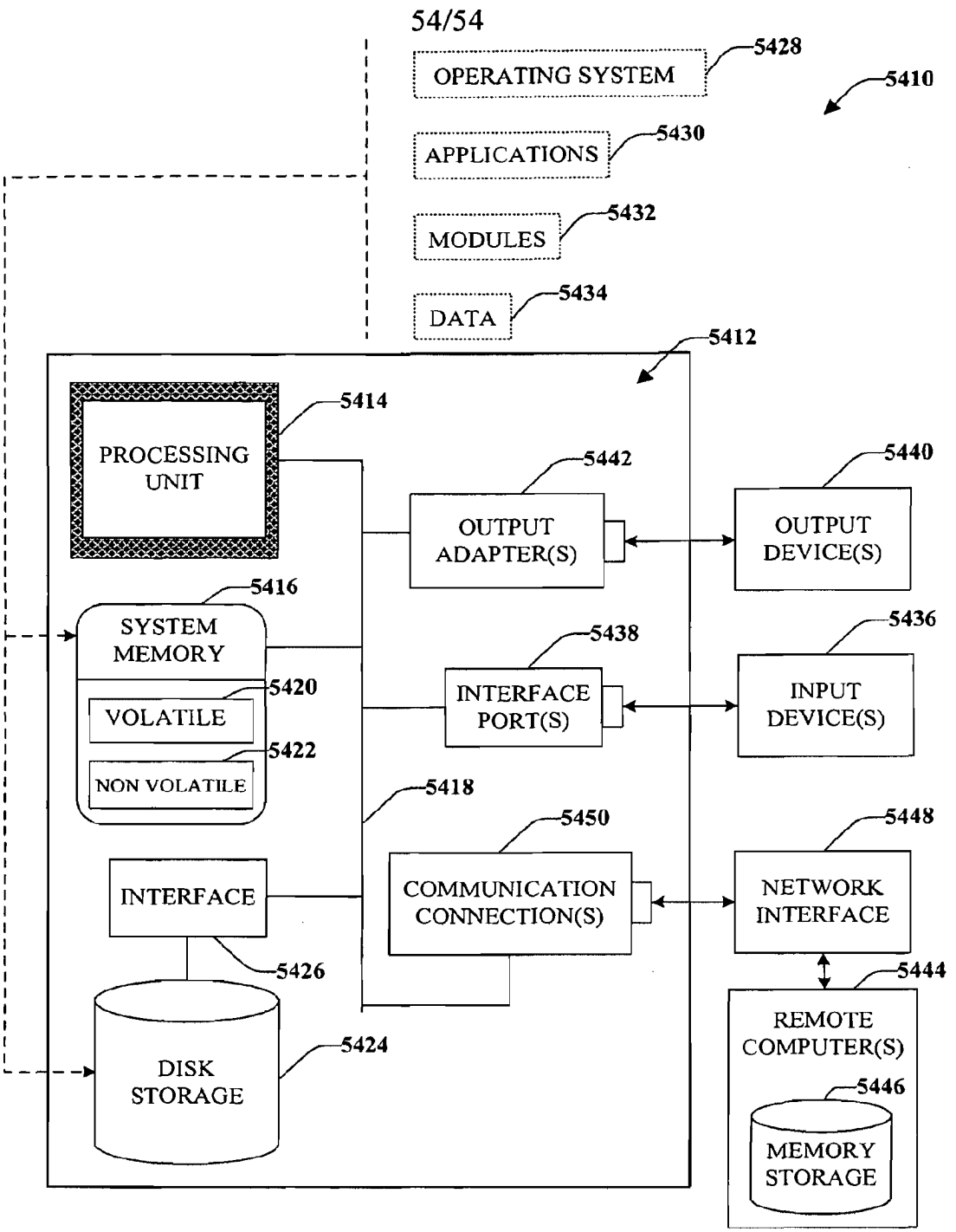

54/54
OPERATING SYSTEM
5428
5410
APPLICATIONS
5430
MODULES
5432
DATA
5434
5412
PROCESSING UNIT
5414
OUTPUT ADAPTER(S)
5442
OUTPUT DEVICE(S)
5440
SYSTEM MEMORY
5416
VOLATILE
5420
NON VOLATILE
5422
INTERFACE PORT(S)
5438
INPUT DEVICE(S)
5436
5418
INTERFACE
5426
COMMUNICATION CONNECTION(S)
5450
NETWORK INTERFACE
5448
DISK STORAGE
5424
REMOTE COMPUTER(S)
5444
MEMORY STORAGE
5446

FIG. 54


US007933632B2

(12) **United States Patent**
Flynt et al.

(10) **Patent No.: US 7,933,632 B2**
(45) **Date of Patent: Apr. 26, 2011**

(54) **TILE SPACE USER INTERFACE FOR MOBILE DEVICES**

(75) Inventors: **David Wayne Flynt**, Lake Forest Park, WA (US); **Bryan T. Agnetta**, Seattle, WA (US); **Sally Louise Barton**, Seattle, WA (US); **Eduardo L. Escardo-Raffo**, Seattle, WA (US); **Tirthankar Sengupta**, Sammamish, WA (US); **Peter G. Chin**, Seattle, WA (US); **Hok-Sum Horace Luke**, Mercer Island, WA (US)

(73) Assignee: **Microsoft Corporation**, Redmond, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 936 days.

(21) Appl. No.: **11/424,733**

(22) Filed: **Jun. 16, 2006**

(65) **Prior Publication Data**

US 2007/0082707 A1 Apr. 12, 2007

Related U.S. Application Data

(60) Provisional application No. 60/718,187, filed on Sep. 16, 2005.

(51) **Int. Cl.**
H04M 1/00 (2006.01)

(52) **U.S. Cl.** **455/569.1**; 379/93.17; 379/433.01; 340/995.1

(58) **Field of Classification Search** 455/564, 455/569.1; 345/156, 173, 358, 428; 379/93.17; 273/292

See application file for complete search history.

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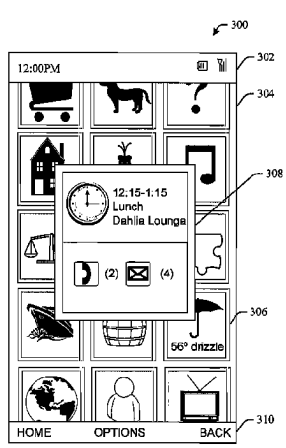
Primary Examiner — William D Cumming
(74) *Attorney, Agent, or Firm* — Woodcock Washburn LLP

(57) **ABSTRACT**

Systems and methods for providing a user interface for mobile devices enable data and services available through the mobile device to be represented as a set of tiles maintained in a display space. The tiles provide a snapshot of the current state of content available through the mobile device without requiring any interaction by the user. The tiles and display space are customizable and can be dynamically updated to display content to a user. In addition, tiles can provide functionality, including simple tasks to a user without requiring the user to navigate away from the tile display space. Tiles can also provide quick access to start software applications. Tiles can be organized in the display space by the user or the tiles can be automatically grouped based upon associated metadata.

20 Claims, 15 Drawing Sheets



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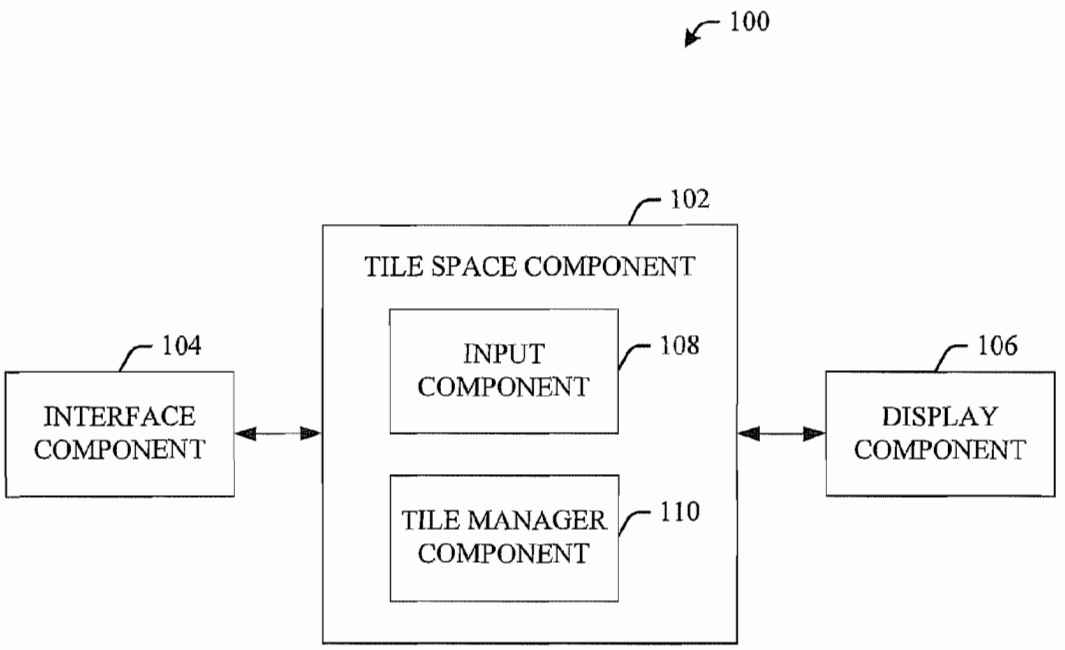
100
102
TILE SPACE COMPONENT
INPUT COMPONENT
108
TILE MANAGER COMPONENT
110
104
INTERFACE COMPONENT
106
DISPLAY COMPONENT

FIG. 1

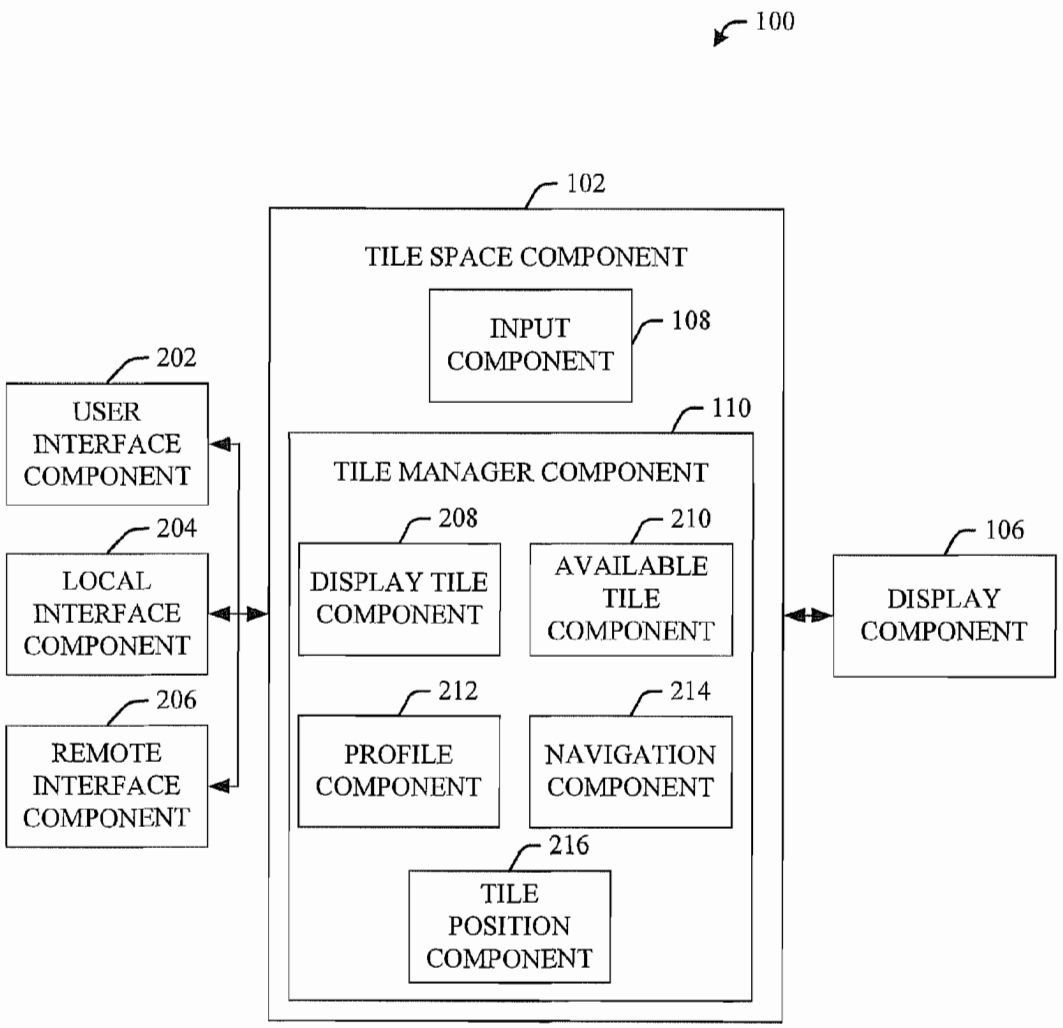
100
102
TILE SPACE COMPONENT
INPUT COMPONENT
108
110
TILE MANAGER COMPONENT
208
DISPLAY TILE COMPONENT
210
AVAILABLE TILE COMPONENT
212
PROFILE COMPONENT
214
NAVIGATION COMPONENT
216
TILE POSITION COMPONENT
202
USER INTERFACE COMPONENT
204
LOCAL INTERFACE COMPONENT
206
REMOTE INTERFACE COMPONENT
106
DISPLAY COMPONENT

FIG. 2

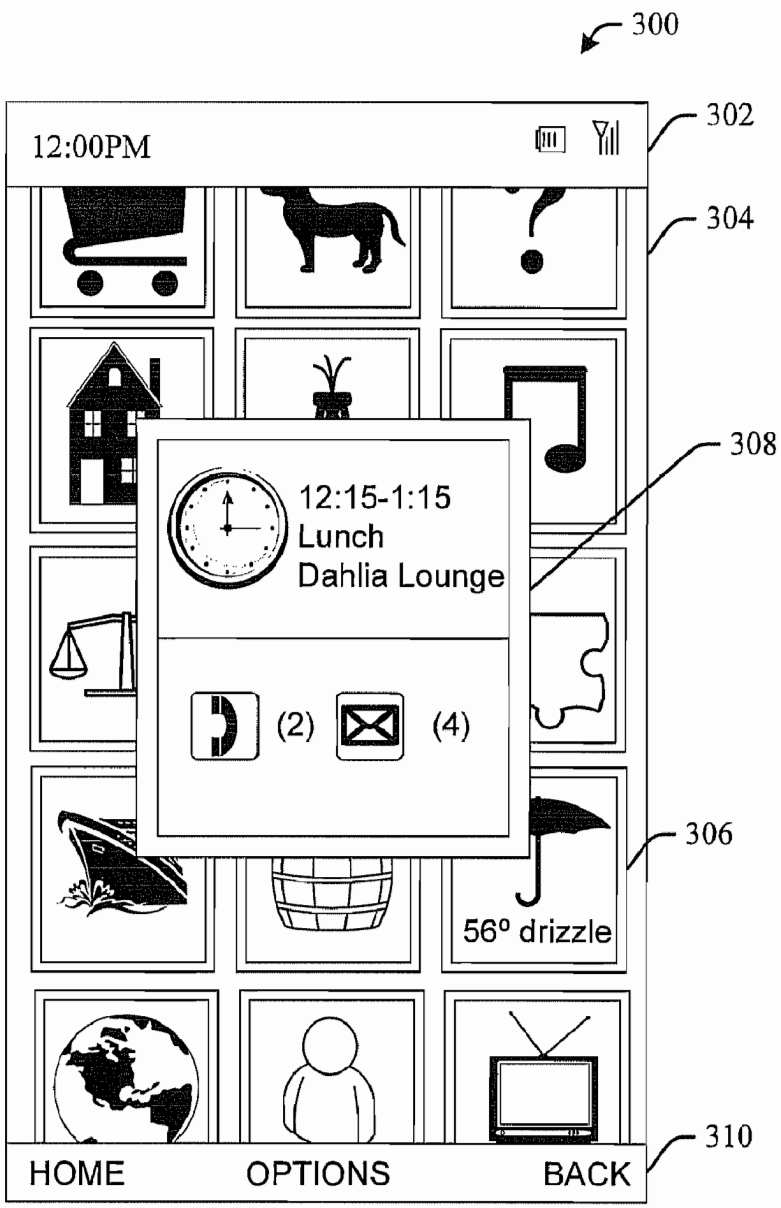
300
302
304
308
306
310
12:00PM
12:15-1:15
Lunch
Dahlia Lounge
(2)
(4)
56° drizzle
HOME
OPTIONS
BACK

FIG. 3

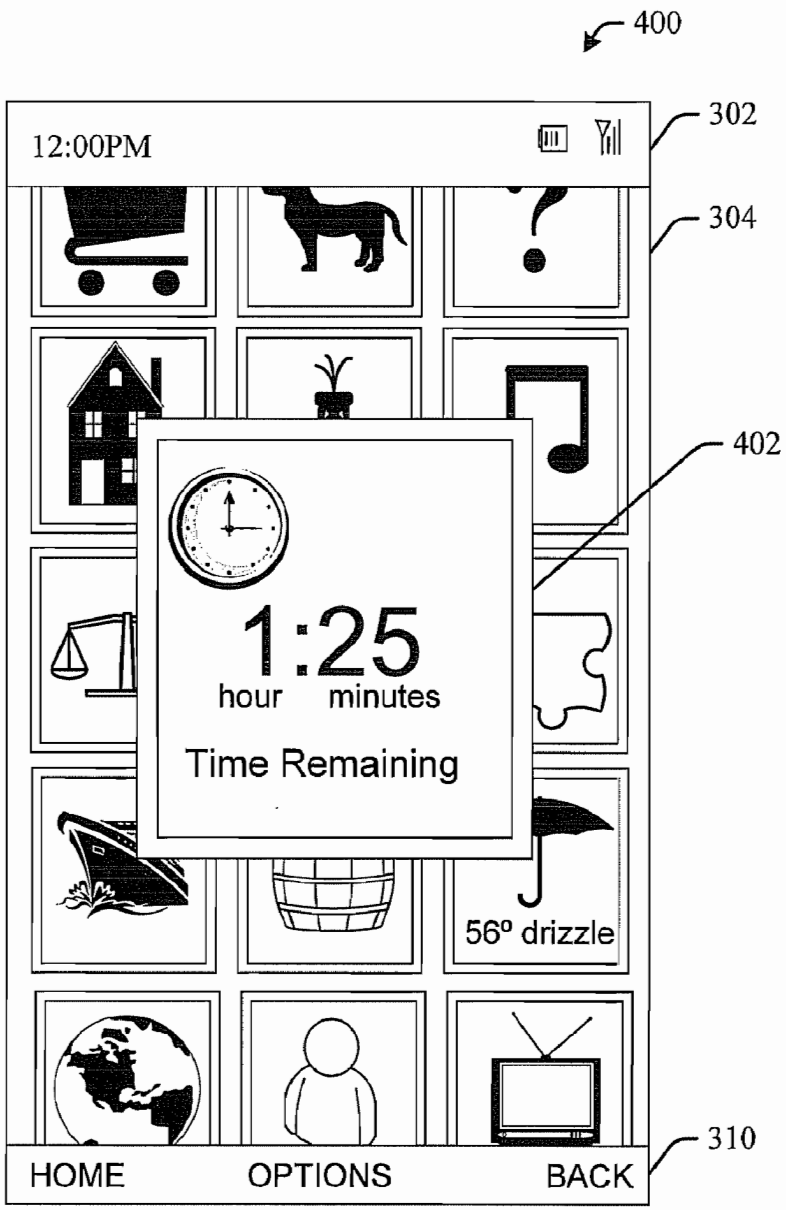
400
12:00PM
302
304
402
1:25
hour minutes
Time Remaining
56° drizzle
310
HOME
OPTIONS
BACK

FIG. 4

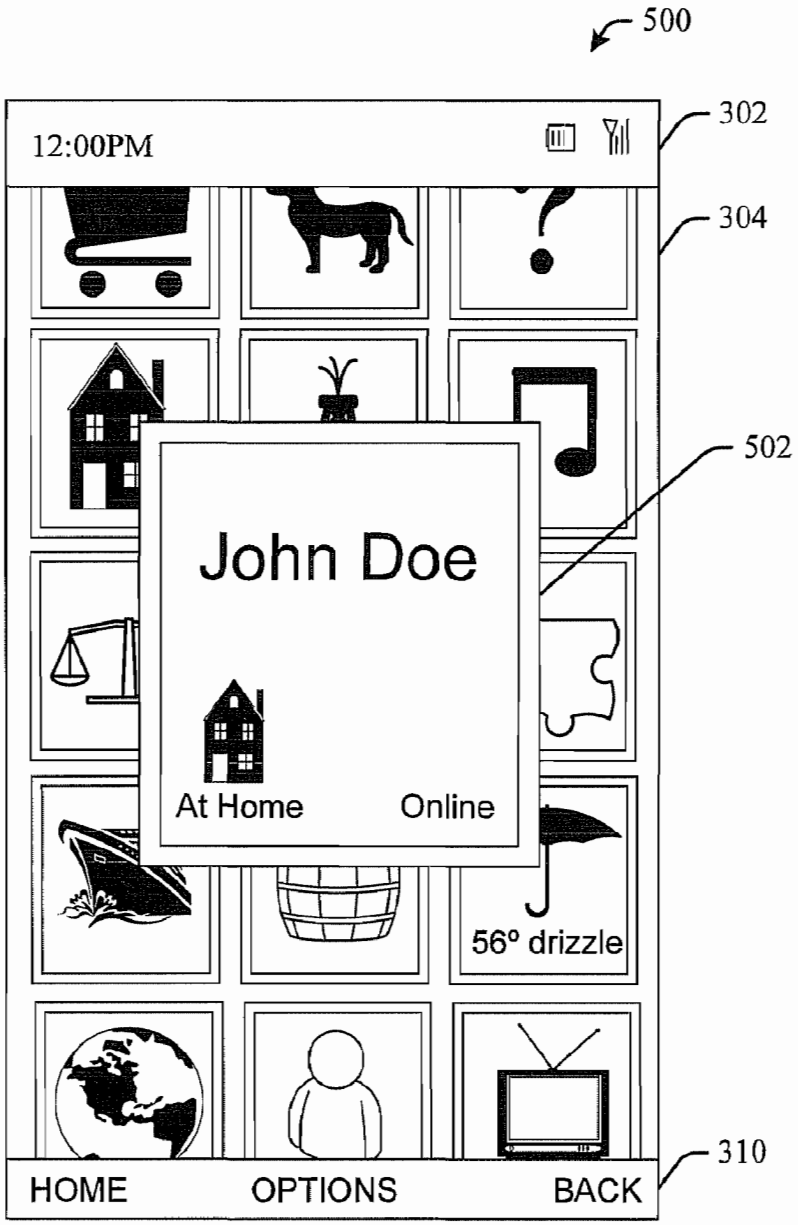
500
12:00PM
302
304
502
John Doe
At Home
Online
56° drizzle
310
HOME
OPTIONS
BACK

FIG. 5

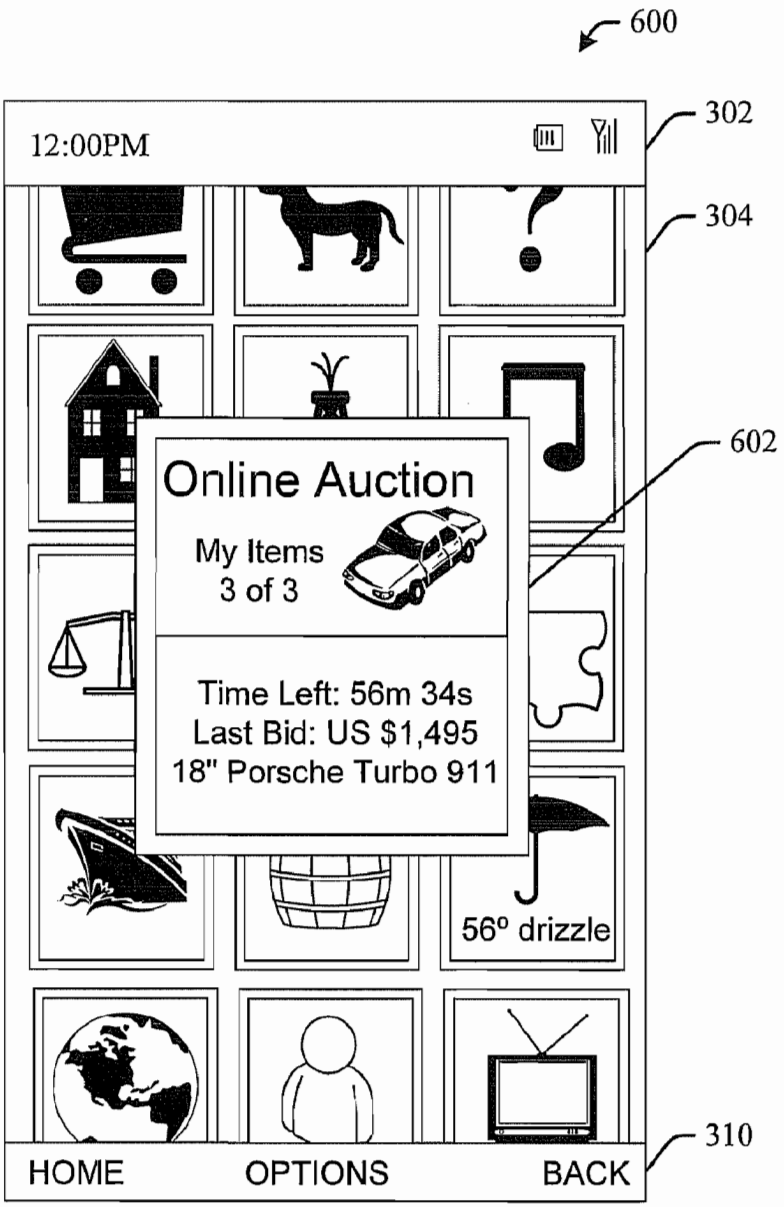
600
12:00PM
302
304
602
Online Auction
My Items
3 of 3
Time Left: 56m 34s
Last Bid: US $1,495
18" Porsche Turbo 911
56° drizzle
310
HOME
OPTIONS
BACK

FIG. 6

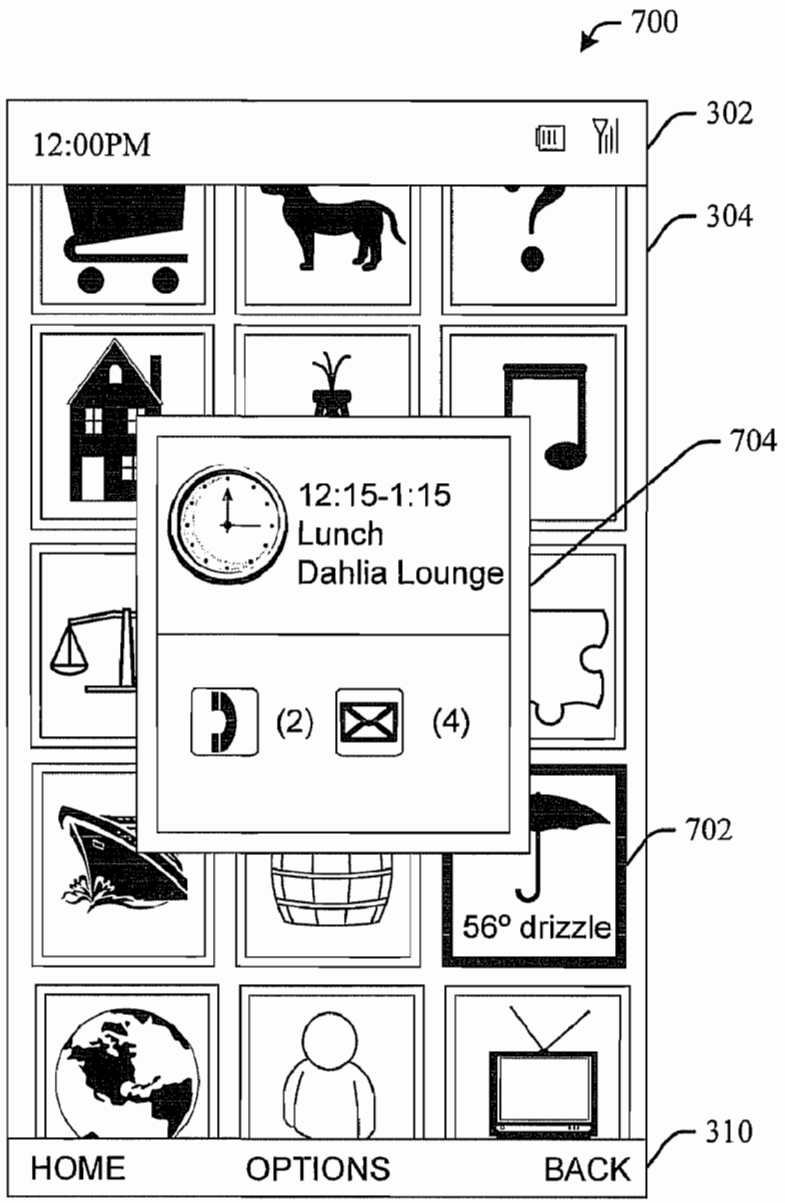
700
12:00PM
302
304
704
12:15-1:15
Lunch
Dahlia Lounge
(2)
(4)
702
56° drizzle
310
HOME
OPTIONS
BACK

FIG. 7

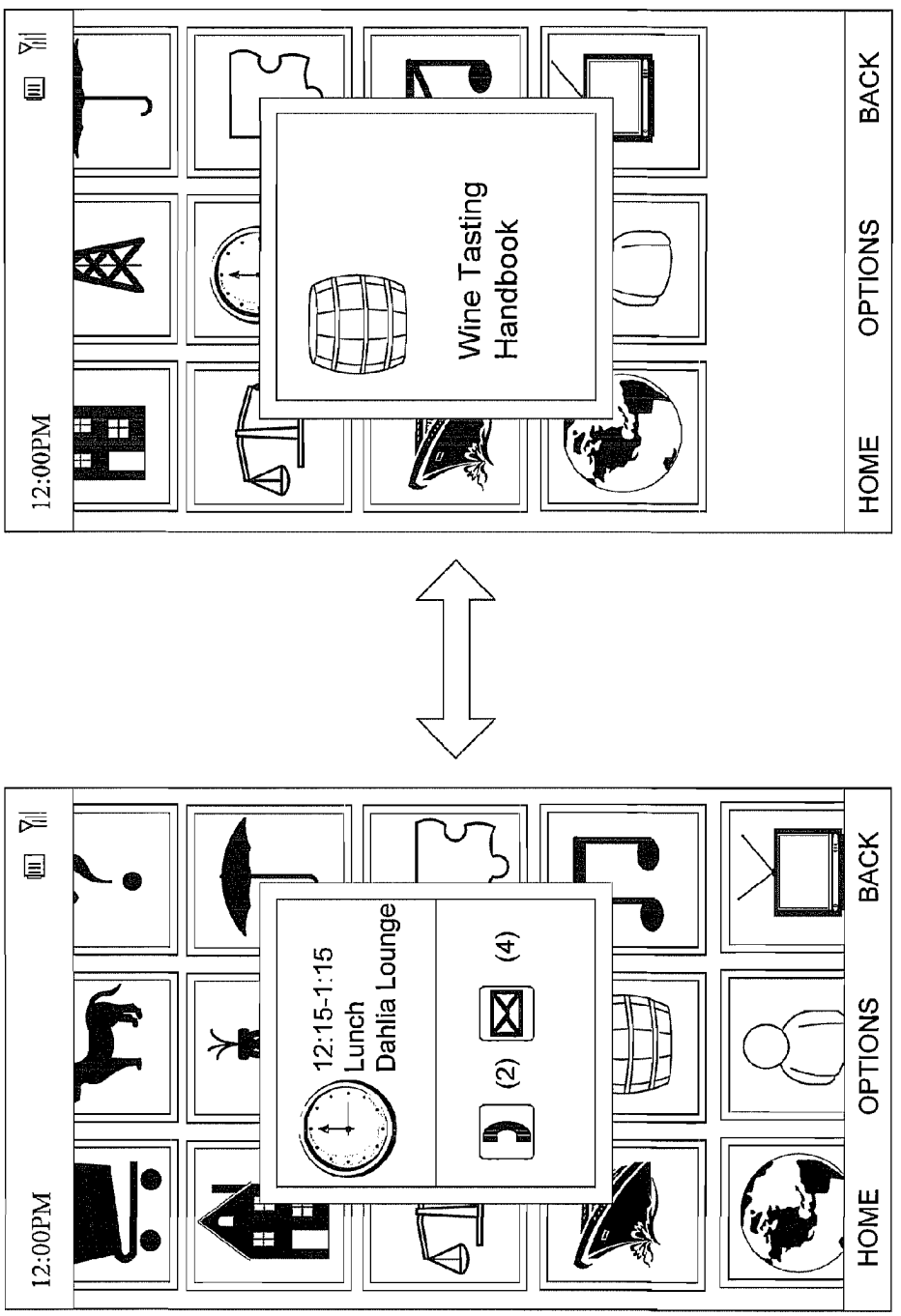
12:00PM
Wine Tasting Handbook
HOME
OPTIONS
BACK
12:00PM
12:15-1:15
Lunch
Dahlia Lounge
(2)
(4)
HOME
OPTIONS
BACK

FIG. 8

FIG. 9

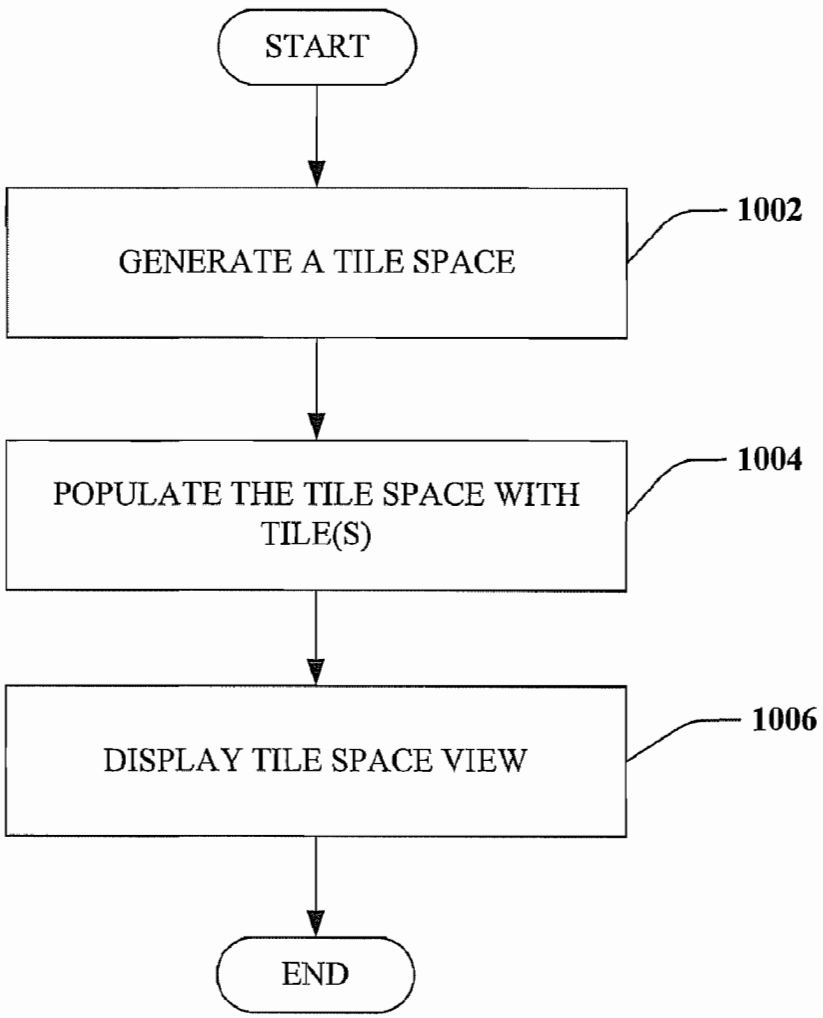
START
GENERATE A TILE SPACE
1002
POPULATE THE TILE SPACE WITH TILE(S)
1004
DISPLAY TILE SPACE VIEW
1006
END

FIG. 10

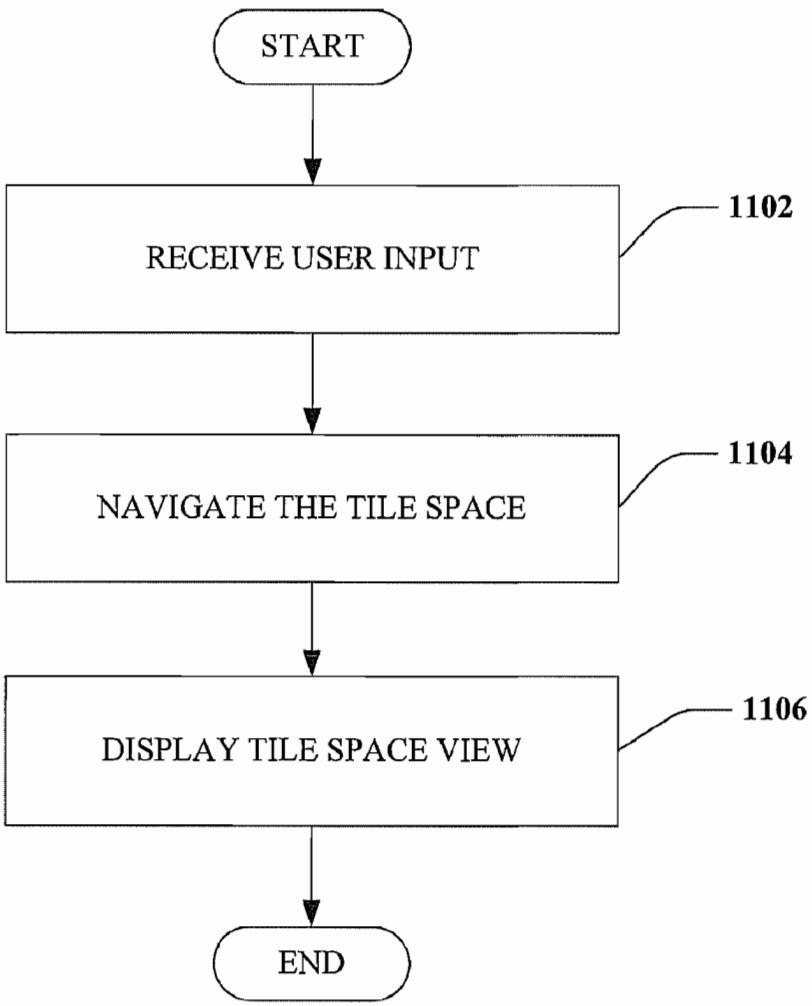
START
RECEIVE USER INPUT
1102
NAVIGATE THE TILE SPACE
1104
DISPLAY TILE SPACE VIEW
1106
END

FIG. 11

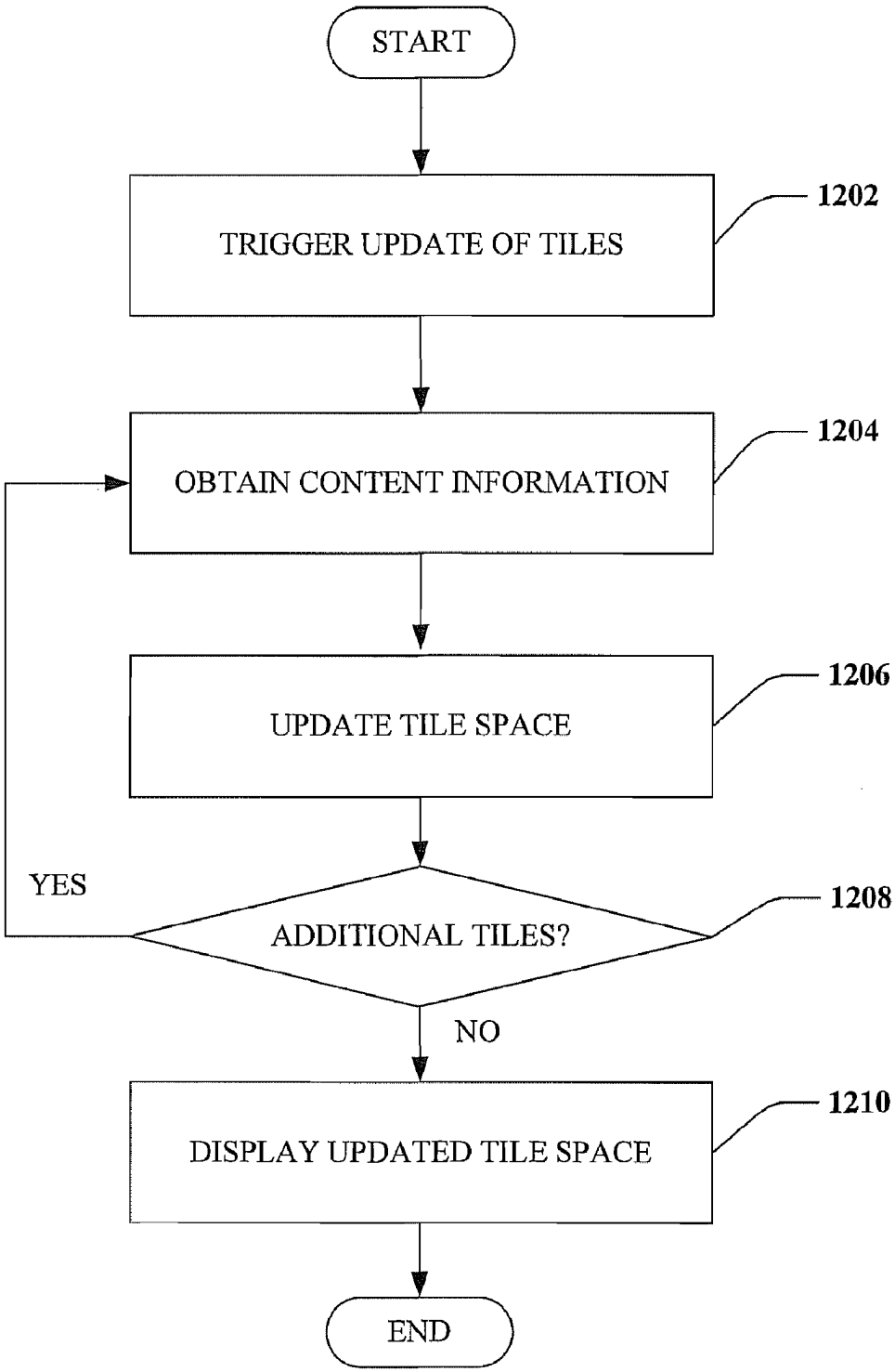
START
TRIGGER UPDATE OF TILES
1202
OBTAIN CONTENT INFORMATION
1204
UPDATE TILE SPACE
1206
YES
ADDITIONAL TILES?
1208
NO
DISPLAY UPDATED TILE SPACE
1210
END

FIG. 12

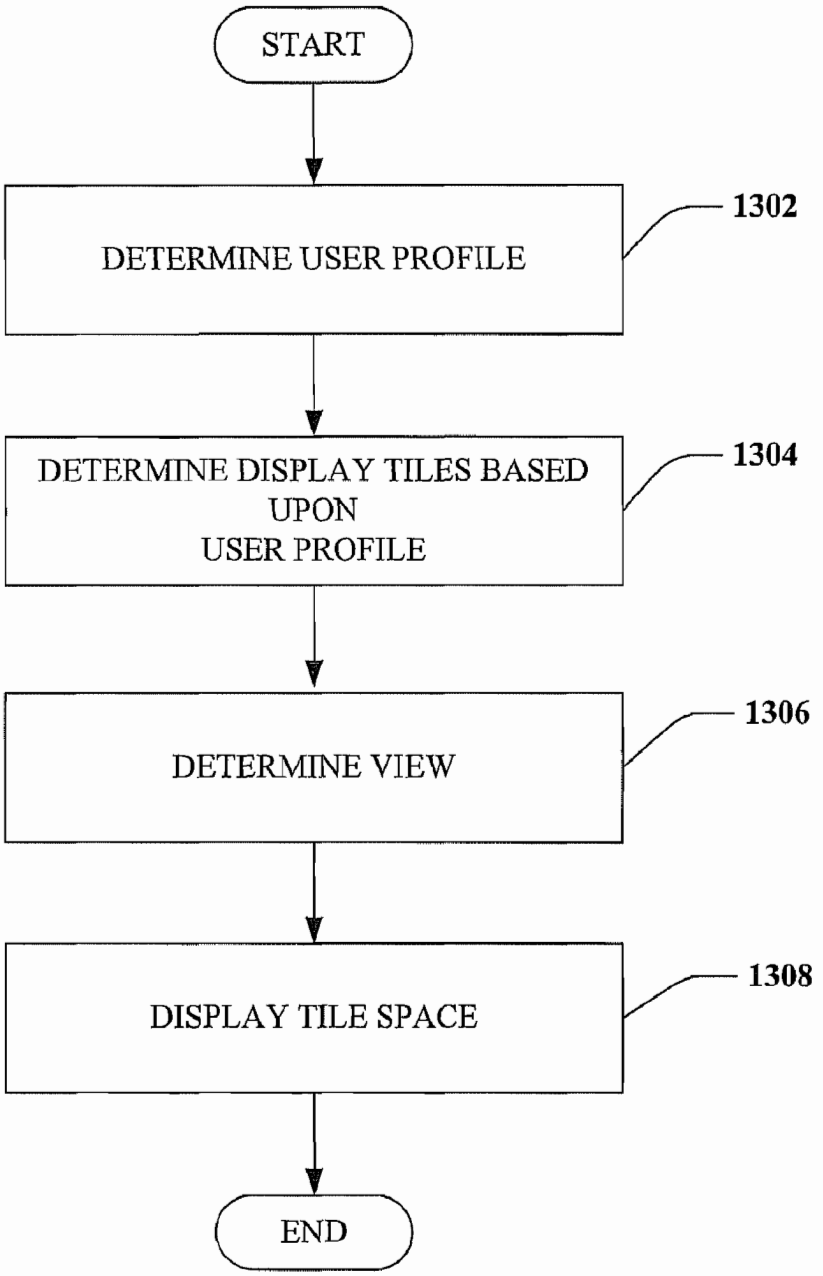
START
DETERMINE USER PROFILE
1302
DETERMINE DISPLAY TILES BASED UPON USER PROFILE
1304
DETERMINE VIEW
1306
DISPLAY TILE SPACE
1308
END

FIG. 13

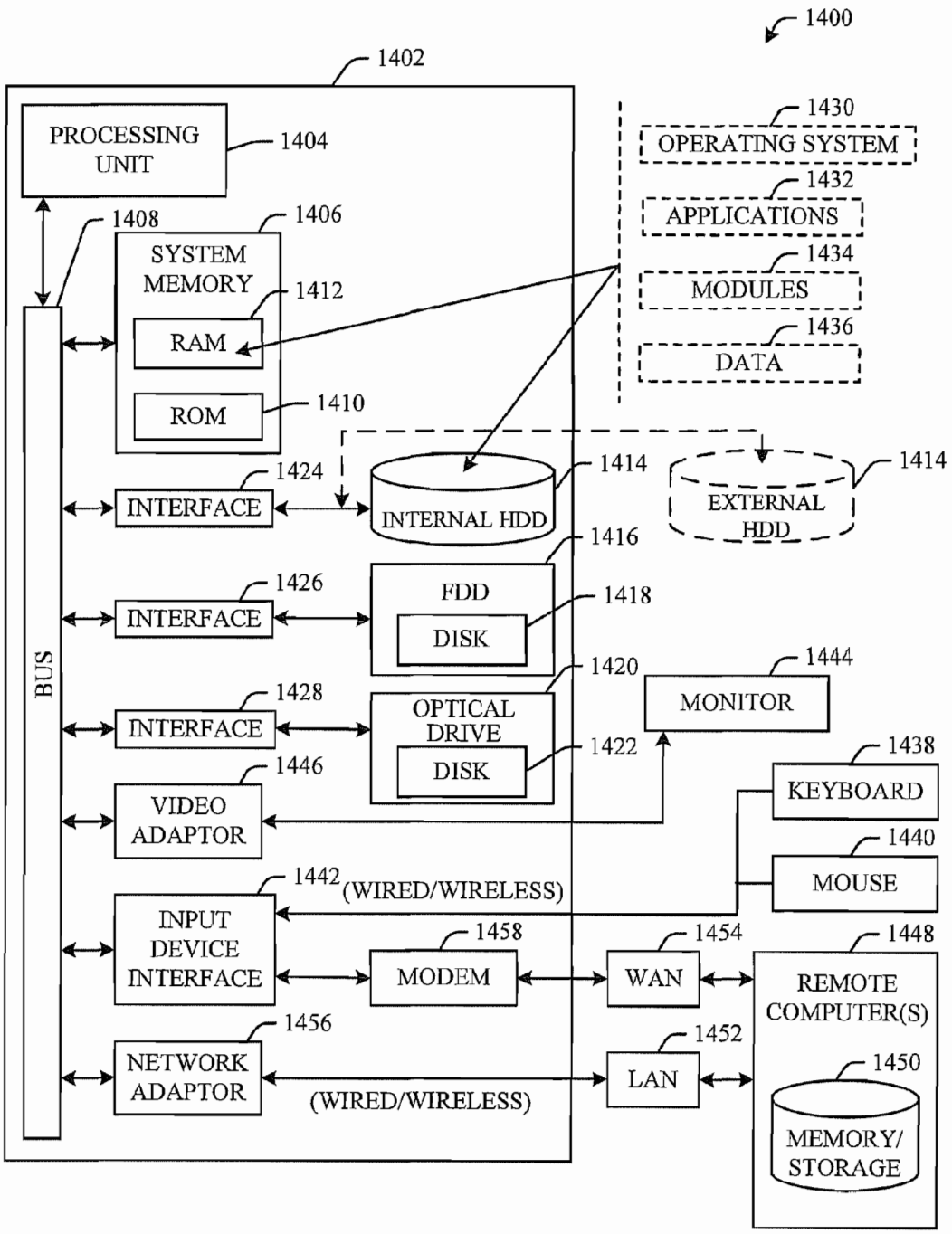
1400
1402
PROCESSING UNIT
1404
1408
1406
SYSTEM MEMORY
1412
RAM
ROM
1410
BUS
1424
INTERFACE
1426
INTERFACE
1428
INTERFACE
1446
VIDEO ADAPTOR
1442
(WIRED/WIRELESS)
INPUT DEVICE INTERFACE
1458
MODEM
1456
NETWORK ADAPTOR
(WIRED/WIRELESS)
1430
OPERATING SYSTEM
1432
APPLICATIONS
1434
MODULES
1436
DATA
1414
INTERNAL HDD
1414
EXTERNAL HDD
1416
FDD
1418
DISK
1420
OPTICAL DRIVE
1422
DISK
1444
MONITOR
1438
KEYBOARD
1440
MOUSE
1454
WAN
1452
LAN
1448
REMOTE COMPUTER(S)
1450
MEMORY/ STORAGE

FIG. 14

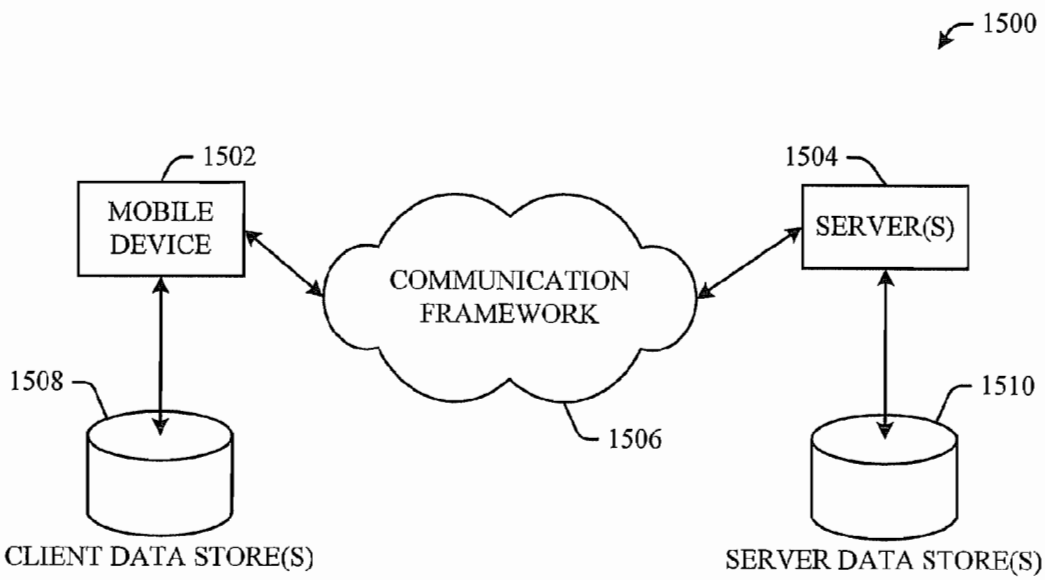
1500
1502
MOBILE DEVICE
1504
SERVER(S)
COMMUNICATION FRAMEWORK
1506
1508
CLIENT DATA STORE(S)
1510
SERVER DATA STORE(S)

FIG. 15

TILE SPACE USER INTERFACE FOR MOBILE DEVICES

CROSS-REFERENCE TO RELATED APPLICATIONS

This is an application claiming benefit under 35 U.S.C. 119(e) of U.S. Provisional Patent application Ser. No. 60/718,187 entitled "ENHANCED PORTABLE DEVICE NAVIGATION TOOLS" and filed Sep. 16, 2005. This application is also related to co-pending U.S. patent application Ser. No. 11/424,720, entitled, "SEARCH INTERFACE FOR MOBILE DEVICES", and filed Jun. 16, 2006; U.S. patent application Ser. No. 11/424,713, entitled, "EXTENSIBLE, FILTERED LISTS FOR MOBILE DEVICE USER INTERFACE", and filed Jun. 16, 2006; and U.S. patent application Ser. No. 11/424,706, entitled, "CONTENT SHARING USER INTERFACE FOR MOBILE DEVICES", and filed Jun. 16, 2006. The entireties of the above-noted applications are incorporated by reference herein.

BACKGROUND

Mobile or portable devices have become increasingly popular and prevalent in today's society. Many users utilize a mobile device, such as a cellphone, as their primary means of communication and carry such devices with them constantly. Mobile devices can include multiple functions such as cellular phone service, voice over Internet protocol ("VoIP") phone service, software applications, email access, Internet capabilities, calendar functions, music players and the like. Functions, features and capabilities have increased both the utility and complexity of mobile devices. It is likely that functions will continue to be added to mobile devices further increasing both usefulness and intricacy.

While consumers desire additional functionality, the sheer volume of information and features make it difficult for users to access commonly used data and functions. Mobile device complexity also makes it difficult for users to fully exploit the capabilities of such devices. The problem is exacerbated by the generally limited user interfaces of mobile devices. Such devices are designed to be small, lightweight and easily portable. Consequently, mobile devices typically have limited display screens, keypads, keyboards and/or other input devices. Due to the size of the user input devices and display screens, it may be difficult for users to enter, retrieve and view information using mobile devices.

Users may have difficulty in accessing the information or function they desire due to the organization of the volume and variety of information that may be contained in or accessed by the mobile device, as well as the growing number of functions such devices are capable of supporting. Conventional menu structures for mobile devices require users to remember a hierarchy of functions or applications to reach the desired data or task. Information is frequently organized based upon the application software that provides or manages the information. Consequently, users can be required to access information based upon the various software applications rather than based upon user utility. Users can become frustrated when they are unable to locate the desired information or tasks and may be unable to fully exploit the advantages of the mobile device.

SUMMARY

The following presents a simplified summary in order to provide a basic understanding of some aspects of the claimed subject matter. This summary is not an extensive overview. It is not intended to identify key/critical elements or to delineate the scope of the claimed subject matter. Its sole purpose is to present some concepts in a simplified form as a prelude to the more detailed description that is presented later.

Briefly described, the provided subject matter concerns an improved user interface for mobile devices such as smartphones, personal digital assistants (PDAs) and the like. An enhanced, customizable user interface can be updated dynamically to provide users with content without requiring user interaction. Users can monitor status and/or data of content accessible through the mobile device by simply observing the user interface.

The user interface can include a set of dynamic tiles. The tiles can include graphics, text or any other visual data. A number of tiles can be displayed using thumbnail views that provide minimal data. In addition, a tile can be selected as the active tile and displayed in an enlarged view including additional content. Tiles can be updated to reflect changes to associated content accessible through the mobile device. Content can be local to the mobile device or located remotely. For example, a tile can include data provided by an Internet subscription news service. Tiles can also provide independent functionality, including simple tasks, to users without requiring users to navigate away from the tile display space. In addition, tiles can provide users with quick, direct access to launch software applications available through the mobile device.

Tiles can be positioned within a tile space. A tile space can be any shape or size and can extend beyond the edges of a display screen of a mobile device. Users can utilize a keypad, stylus or the like to pan the display to view additional portions of the tile space. In addition, the active tile can be updated based upon navigation through the tile space, allowing users to see a summary view of additional tiles.

Tiles can be positioned or placed within a tile space to optimize presentation of content to users. Users can specifically position tiles within the tile space. In addition, the user interface can perform certain basic organization tasks to position tiles within a tile space. For example, the user interface can reorganize tiles to remove gaps between tiles. The user interface can also group or cluster tiles based upon metadata associated with the tiles. For instance, the user interface can group tiles associated with work-related projects in the lower, left portion of the tile space while grouping tiles associated with a user's personal life in the upper, right portion of the tile space.

To the accomplishment of the foregoing and related ends, certain illustrative aspects of the claimed subject matter are described herein in connection with the following description and the annexed drawings. These aspects are indicative of various ways in which the subject matter may be practiced, all of which are intended to be within the scope of the claimed subject matter. Other advantages and novel features may become apparent from the following detailed description when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a block diagram of a system for providing a tile space display in accordance with an aspect of the subject matter disclosed herein.

FIG. **2** is a block diagram of a system for providing a tile space display in accordance with an aspect of the subject matter disclosed herein.

FIG. **3** is an exemplary display depicting a tile space in accordance with an aspect of the subject matter disclosed herein.

FIG. **4** is an exemplary display depicting an independent tile in accordance with an aspect of the subject matter disclosed herein.

FIG. **5** is an exemplary display depicting a content tile in accordance with an aspect of the subject matter disclosed herein.

FIG. **6** is an exemplary display depicting a content tile in accordance with an aspect of the subject matter disclosed herein.

FIG. **7** is an exemplary display depicting an alert in accordance with an aspect of the subject matter disclosed herein.

FIG. **8** illustrates navigation of an exemplary display in accordance with an aspect of the subject matter disclosed herein.

FIG. **9** illustrates a zoomed out display in accordance with an aspect of the subject matter disclosed herein.

FIG. **10** illustrates a methodology for providing a tile space in accordance with an aspect described herein.

FIG. **11** illustrates a methodology for navigating a tile space in accordance with an aspect described herein.

FIG. **12** illustrates a methodology for updating a tile space in accordance with an aspect described herein.

FIG. **13** illustrates a methodology for updating a tile space based upon a user profile in accordance with an aspect described herein.

FIG. **14** is a schematic block diagram illustrating a suitable operating environment.

FIG. **15** is a schematic block diagram of a sample-computing environment.

DETAILED DESCRIPTION

The various aspects of the subject matter described herein are now described with reference to the annexed drawings, wherein like numerals refer to like or corresponding elements throughout. It should be understood, however, that the drawings and detailed description relating thereto are not intended to limit the claimed subject matter to the particular form disclosed. Rather, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the claimed subject matter.

As used herein, the terms "component," "system" and the like are intended to refer to a computer-related entity, either hardware, a combination of hardware and software, software, or software in execution. For example, a component may be, but is not limited to being, a process running on a processor, a processor, an object, an executable, a thread of execution, a program, and/or a computer. By way of illustration, both an application running on computer and the computer can be a component. One or more components may reside within a process and/or thread of execution and a component may be localized on one computer and/or distributed between two or more computers.

The word "exemplary" is used herein to mean serving as an example, instance, or illustration. The subject matter disclosed herein is not limited by such examples. In addition, any aspect or design described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over other aspects or designs.

Content on mobile devices can take many forms including, but not limited to, contact information, calendar items, mail, music, photos, documents, and tasks or actions. Access to content including data and available tasks is typically provided only through software applications specific to the data type of the content, such as an application used to create or render the specific content data type. For example, to read email from a contact, a user may be required to navigate to and open an email application. To telephone that same contact with a question regarding that email, the user may be required to navigate to the space where that contact's communication details are visible (e.g., a contact card specifying contact specific information). Finding relevant information can require first determining the appropriate software application, opening the application and searching for the relevant information within the application. To view mail from a specific sender, the user may be required to navigate to an email application and search by the sender's name.

An enhanced user interface can include a tile space that can function as a home screen for a user, providing relevant content and quick access to applications. The tile space can provide users with a view or dashboard to monitor the current state of a subset of content obtainable through the mobile device. Many of the most frequently used functions or data can be accessed without navigating away from the tile space. The tile space can be capable of managing any number of tiles. One or more sets of tiles can be customized to provide for a particular user.

Individual tiles can provide users with access to applications, application content, remote content and/or independent functionality. One or more tiles can provide a user with the data and tasks most likely to be relevant to the particular user without requiring the user to leave the tile space. Typically, tiles are represented in a small or thumbnail view that provides some minimal amount of information. One tile, referred to herein as the active tile, can be shown in an expanded or summary view. An expanded view of the active tile allows additional information or functions to be provided to a user without necessitating navigation from the tile space to an application space. Users can select an active tile from the set of tiles managed by a tile space.

Referring now to FIG. **1**, a display system **100** for a mobile device in accordance with an aspect of the subject matter disclosed herein is illustrated. The system **100** can include a tile space component **102** that receives input from one or more interface components **104** and changes the view of a tile space on a mobile device (not shown) via a display component **106** according to such input. The system **100** can operate on any type of mobile device, including, but not limited to, a PDA, text messenger, cellular phone, pocket personal computer, smartphone, ultra-mobile tablet PC and the like. Input from the interface component **104** can include content obtained from one or more software applications. Input can also include user input generated using a touch screen, keypad, joystick, or any other type of control. A single interface component **104** is illustrated herein for simplicity; however, as shown in FIG. **2**, multiple interface components can be utilized including separate interface components for user input and input from applications.

The interface component **104** can include or can be connected to a content sharing system capable of facilitating sharing of content from multiple software applications. A content sharing system can provide a standard interface between clients such as the interface component **104** and applications providing content. This interface ensures that clients need not have knowledge of the underlying data structures or even the identity of applications to access content.

A content sharing system can manage the supply of data and simple tasks associated with the data to the interface component **104**. Applications can register new categories or classifications of data and associated tasks with the content sharing system, automatically allowing the interface compo-

nent **104** to access the new data categories and tasks. Applications can also provide the content sharing system with data supplier components capable of retrieving data from the underlying data stores of the applications. In addition, applications can provide task executors capable of executing actions or tasks on data items of selected data types or categories. The central content sharing system can provide data and tasks to clients in response to queries or requests.

The interface component **104** can obtain data and associated tasks by generating a query specifying the category or type of data requested as well as context used to identify relevant data of the requested category. A set of data requests based upon the query from the interface component **104** can be distributed to data supplier components for various software applications. The data supplier components can retrieve the relevant data from the underlying data stores of associated applications and the retrieved results can be assembled and returned to the interface component **104**. The query, data requests and query results can be specified in a declarative language, such as extended markup language (XML) to facilitate transfer of data without requiring knowledge of data structures by the client.

In another embodiment, the interface component **104** can interact directly with one or more software applications. Applications can notify the interface component **104** of a change to content and provide updated content directly to the interface component **104**. In addition, the interface component can poll or request content from one or more applications either dynamically or periodically.

The tile space component **102** can include an input component **108** that obtains, receives and/or requests input including user input and content from the interface component **104**. The input can be used to generate the view of the tile space. In addition, the tile space component **102** can include a tile manager component **110** that manages a set of tiles that can be displayed in a tile space.

Referring now to FIG. **2**, the display system **100** can include multiple interface components that provide input to the tile space component **102**. The display system **100** can include a user interface component **202** that provides for input from a user. The system can also include a local interface component **204** that provides local content including data and tasks from software applications local to the mobile device. In addition, the system can include a remote interface component **206** that allows for input from remote sources. For instance, a remote interface component **206** can obtain data from an Internet source. One or more of the interface components can be combined into a single interface component.

The tile manager component **110** can include a display tile component **208** and an available tile component **210**. An available tile component **210** can manage a set of all tiles currently available for inclusion in the tile space. The set of tiles currently managed in the tile space are referred to herein as the display tiles and are managed by the display tile component **208**. The display tiles can be a subset of the set of available tiles offered by the available tile component **210**. For example, a large number of possible tiles can be generated either by users, vendors or other entities. Users can select from this large set of available tiles to determine tiles to include within the set of display tiles. Users can customize the set of available tiles and/or display tiles by adding or deleting tiles. The set of available tiles can be identical to the display tiles if all available tiles are included within the tile space.

Users can generate and/or utilize one or more user profiles that specify one or more tiles from the available tiles to be included in the set of display tiles. The profile component **212** can manage one or more user profiles. Different user profiles can be generated to reflect the varying needs or interests of a user. Profiles can be generated based upon location, time of day, day of week, user context or any other user condition that can effect the set of tiles most likely to be relevant to the user. For example, a user can specify a work profile that includes a set of tiles specific to the user's occupation. The user can also create a separate user profile for use outside of work. For instance, users can create weekend profiles including tiles associated with entertainment information, personal contacts and the like. Users can also create profiles specific to geographic locations. Geographic profiles can be particularly useful for users that travel frequently. A user profile can also effect other mobile device or user interface settings and need not be limited to specification of display tiles.

Selection of a user profile can update, reorganize, add or delete display tiles. Users can view a list of possible user profiles and select the most appropriate profile for their current context or state. Alternatively, a user profile can be automatically selected based upon one or more predetermined conditions, such as time of day or day of week. For example, a determination can be made that it is a weekend day and a weekend user profile can be utilized to select or organize a set of display tiles. During weekdays, an alternate set of tiles can be displayed based upon a weekday profile. User profiles can also be selected based at least in part upon geographic location. If the mobile device is capable of determining location, whether using a global positioning system (GPS) or any other manner of determining location, a profile can be selected based upon location of the mobile device. The mobile device can determine if the user is at home, at work or on travel and select the most appropriate user profile. A user can override any user profile selections either by electing a different user profile or by individually adding and/or deleting tiles from the current set of display tiles.

The tile manager component **110** can include a navigation component **214** that controls movement through the tile space. The tile space can extend beyond the limits of the display screen of the mobile device. To view portions of the tile space not currently shown on a display screen a user can indicate a direction to navigate within the tile space via the user interface component **202**. The navigation component **214** can determine the tiles in the tile space currently visible and track and update the tiles. Navigation can update the active tile. Typically only one tile is active at any one time; the remainder of the tiles is displayed in a background or thumbnail view. Navigating through the tile space changes the tile that has focus, updating the active tile shown in the summary view.

The navigation component **214** can automatically control navigation through the tile space. For example, the navigation component **214** can automatically navigate to the center of the tile space upon start up. In addition, the navigation component **214** can automatically navigate to display tiles with updated content

In addition, the tile manager component **110** can include a tile position component **216** that controls the placement of tiles within the tile space. Tiles can be positioned within the tile space using a variety of methods. Users can specify the position of any or all tiles. In addition, the tile position component **216** can automatically perform certain basic organization operations. For example, the tile position component **216** can prevent a tile from becoming separated from the remainder of the tiles within the tile space by automatically adding or moving tiles adjacent to existing tiles, if any, and removing empty spaces between tiles.

The tile position component **216** can group or cluster related tiles within the tile space. The tile position component

216 can utilize metadata associated with tiles to position like tiles in proximity to each other. Tiles can be grouped based upon user generated classifications and/or metadata. For instance, a user can classify all work-related tiles with one code and classify personal contacts with a second, separate code, thereby creating two distinct clusters of tiles in the tile space. Users can also specify portions of the tile space associated with the classifications. For instance, work-related tiles can be clustered in the upper left portion of the tile space, while personal contacts can be clustered in the bottom right portion of the tile space. Tiles can also be clustered by date of creation, type of data managed by the tile or any other data associated with a tile.

Referring now to FIG. **3**, an exemplary user interface display **300** including a view of a tile space is illustrated. The user interface display **300** can include a title bar **302** that can include icons, images and/or text indicating the current time, battery power, connectivity or any other status indicators for the mobile device. The user interface display **300** can also include a view of a tile space **304**. A view of the tile space **304** can include all or a portion of the tile space displayed on the user interface display **300**. The tile space **304** can be represented as a grid of rectangular graphic tiles. Each tile can have two separate visual representations, active and background. The tile space **304** can include one or more tiles **306** in background or thumbnail view. A single background tile **306** is numbered here for simplicity, however as shown in FIG. **3**, the tile space **304** can include a plurality of background tiles **306**.

The tile space **304** can also include a tile in active or summary view **308**. The tile currently in focus is referred to as the active tile **308**, shown in summary view. The active tile **308** can include additional information, function and features not available when the tile is shown in background view. For example, a background tile **306** associated with weather information can include the current temperature and conditions in background view. The active or summary view of the same tile can provide additional weather information such as a three day forecast.

In addition, the user interface display **300** can include a softkey bar **310** including one or more softkey functions labels (e.g. Home, Options and More). A softkey is typically a button located proximate to the display space. Generally, the function of the button is defined by the softkey function label shown near the button on the display space. The controls and features illustrated in FIG. **3** are exemplary. Alternative or additional controls and features can be included in a user interface display **300**.

The tile space **304**, background tiles **306** and active tile **308** can present data and tasks to a user at a central location. In addition, tiles can provide users with information without requiring the user to leave the tile space **304**. For instance, even in background view the weather tile **306** can provide a user with weather information at a glance (e.g., current temperature and conditions). Additional information can be obtained by navigating to the weather tile **306**. The user is not required to leave the tile space **304** to obtain the additional information. Moreover, tiles are not limited to simply providing content. Tiles can include various functions, features and capabilities, described in further detail below.

Referring now to FIG. **4**, an exemplary display **400** including an independent tile is illustrated. The tile space **304** can support a variety of tile types, including an independent tile **402**, shown here in active or summary view. Independent tiles reside only in tile space and have no link to content or other applications either local to the mobile device or remote. Independent tiles offer functionality without requiring navigation away from the tile space. The independent tile **402** of FIG. **4** provides an alarm function. The alarm can be set, cancelled, monitored and responded to without leaving the tile space **304**. Users can utilize the alarm tile **402** to track the amount of time left in a parking meter. A background view of the tile can include text indicating the time remaining before the alarm sounds.

Independent tiles can host controls with which the user can interact to preclude requiring the user to navigate away from the tile space to an application. For example, an independent tile can provide a calculator function. A keypad for a mobile device can provide users with the ability to enter numbers. The calculator tile can utilize basic controls such as on screen buttons to implement operators (e.g., +, −, / or *). In another example, an independent tile can provide a simple messaging function.

Referring now to FIG. **5**, an exemplary display **500** including a content tile **502**, shown here in summary view, is illustrated. Content tiles can display or represent content provided or maintained by a software application local to the mobile device. For example, the mobile device can include a contact software application that maintains a list of contacts with associated contact cards. Contacts are generally individuals or entities and contact cards generally include information associated with a contact (e.g., name, title, telephone number, email address, physical address and the like). A content tile **502** can act as a shortcut to a contact card included in the contact list maintained by the contact software application on the mobile device. If the content tile **502** is a background tile, the thumbnail view can include an image of the contact, text or any other information regarding the contact. The content tile **502** can include a context indicator for the contact. The context indicator can show the current state of the contact such as whether the contact is online, the contact's location or any other property of the contact. In summary or background view the content tile for the contact can include graphics, text and any other information associated with the contact.

A content tile **502** can also provide the user with the ability to launch the software application associated with the content. Users can view limited content information from a background tile. Users can view additional content information using the summary view. However, the user may wish to perform additional functions, such as updating the contact card. The content tile **502** can provide a user with the ability to launch the full contact application directly from the tile space, without requiring the user to navigate to a menu of available applications.

Referring now to FIG. **6**, an exemplary display **600** including a content tile **602** associated with remote content, shown here in summary view, is illustrated. Content can be retrieved or obtained from a remote source, such as a server. Vendors of services or data can generate and offer tiles to users. For example, a vendor that maintains an online auction website can provide an auction specific tile to a user, such as content tile **602**. The auction tile **602** can track the current status of any auctions in which the user is participating, indicating auction information such as the current bid or time remaining in an auction. The content tile **602** associated with the auction can update dynamically to reflect content obtained from the remote source (e.g., additional bids by the user and expiration of item auctions). Tiles can be dynamically updated based upon updated content without direct action by the user.

Content tiles can obtain a variety of content from remote sources. For instance, a user may subscribe to a news service. A tile can display a subset of news provided by the news service and/or as well as an indication of important news bulletins. In a further example, a tile can provide user with

access to one or more maps frequently utilized by the user. Typically, geographic data sets such as maps are large. A mobile device may not have the capacity to store multiple maps. Here, a tile can provide quick access to a selected set of maps stored in a remote data store.

Vendors can provide tiles to users as a service. Users can be required to subscribe to the service to obtain content. Alternatively, vendors can provide tiles to users to perform targeted advertising. For example, a clothing retailer can provide a tile that includes data corresponding to online coupons based upon the user's past purchases. In addition, the retailer can provide additional information such as new products tailored to the users buying patterns. In addition, content of the tile can be updated based upon user location. For instance, the provided coupons can be selected based upon proximity of the user to a specific store. Other content accessible from the tile can include information regarding the closest retailer location.

Content tiles can also provide the ability to directly access an associated remote service without having to navigate to a menu of applications. Looking again at the example regarding the online auction, after viewing the summary view, a user can elect to select the tile and access the online auction. An online auction browser can he launched offering the user greater ability to view and interact with desired content, in this case the online auction.

The tile space can also include one or more application tiles. An application tile provides a user with quick, direct access to an application. Activation of an application tile launches the associated application without requiring a user to navigate to a list of applications to search and select the desired application. For instance, an application tile can provide a link to a game or other application. Thumbnail and summary views for application tiles can include graphics, text or other suitable visual cues to allow a user to easily identify the application.

The tile space can also include shortcut tiles. Shortcut tiles can provide shortcuts or links to any other location on the mobile device. For example, the mobile device can include another user interface for navigating mobile device content. Users can utilize a shortcut tile to leave the tile space and navigate to the alternate user interface.

Tiles can include any combination of text, graphic images, hyperlinks or any other visual representation in both summary view and thumbnail view. For example, as shown in FIG. **3**, icon, graphic images and/or text can be rendered within the same tile. Further, an image can be used as the background of the tile with text overlaying the image. Each individual tile can include multiple cells or columns that can be populated with data of varying data types. For instance, a messaging tile can include a column or cell for an icon that can reflect the method of communication (e.g., voicemail or text message), a cell for text including the message content and a cell for text including the sender name. Different columns or cells can have separate tasks associated with the individual columns. Accordingly, selection of an icon within a tile can generate different task options than selection of the sender text in the same tile. In addition, tiles can include audio cues or data. For example, audio data may be triggered when a tile is active or selected.

Referring now to FIG. **7**, an exemplary display **700** including a background tile **702** and an active tile **704**, including alerts or notifications, is illustrated. A notification or alert, as used herein, is an indicator of a change in state, such as updated or additional content. Notifications can include changes to text, text color, font, background or other visual cues utilized to make users aware of changes associated with a tile. A tile can include an alert or notification in either summary or thumbnail views. For example, the border color of background tile **702** can be modified to indicate change. A user can obtain additional information by navigating to the background tile **702** and observing the summary view of the tile. Active tile **704** can also include one or more alerts or notifications of change to associated content. For example, the active tile **704** includes icons representing telephone messages and email messages. Alerts can be represented as text, shown here as parenthetical numbers adjacent to the icons. The text alerts can indicate newly received voicemail and email messages. Notifications and alerts are not limited to the examples illustrated herein. Alerts and notifications can include any audio, visual or tactile indicia, or any combination thereof.

The tiles described herein are managed in a tile space. The tile space can include any number of tiles. The tile space can be a fixed, predetermined size. Alternatively, users can specify the size of the tile space. In yet another alternative, the size of the tile space can vary depending upon the number and location of tiles positioned within the tile space. The tile space can dynamically grow and shrink as tiles are added and deleted. Although the tile space has been illustrated herein as a grid of rectangular tiles, neither the tile space nor the tiles are limited to a rectangular form. Generally, tiles can be similarly sized to facilitate tile management and usability; however, tiles can vary in size. In addition, tiles have been depicted at evenly spaced intervals; however, the tile space can allow random or uneven distribution of tiles. Any arrangement of tiles that is useful to users can be utilized.

Referring now to FIG. **8**, navigation within a tile space display is illustrated. As described above, the tile space can be of any size or dimension. Consequently, the tile space can extend beyond the borders of the display screen of the mobile device. As a user provides input through the user interface, the tile space component, in particular the navigation component, can communicate the necessary data to the display component, which can respond by changing the view of the tile space. For instance, suppose that the user indicates movement downward toward the bottom of the display screen. In response, the display component can shift the view downward to reveal tiles that were previously off the screen. In addition, the tile in active view can be updated. Movement within the tile space need not be limited to simple vertical or horizontal panning.

The tile space can facilitate navigation through the tile space providing for wrapping or warping at the edges of the tile space. For example, if a user continues to indicate movement to the right within the tile space, eventually the user will encounter the edge of the tile space. However, the tile space can warp or wrap to the leftmost edge of the tile space. Consequently, the tile space can form a continuous ring or loop. By continuing to indicate movement to the right, a user will eventually return to the initial portion of the tile space. Alternatively, the tile space can wrap or warp in the vertical direction.

Zones or regions can be defined within the tile space to assist in navigation of the tile space. For example, the tile space can be divided into quadrants with a distinct background color can be chosen for each quadrant. This pattern of background colors can allow users to quickly identify their location within the tile space. A predefined set of zones or quadrants can provide users with any easy method for establishing location. However, any background pattern that allows users to orient within the tile space can be utilized.

The appearance of the tile space and tiles can also be customizable. Color schemes, themes and/or skins can be

selected by the user to personalize the appearance of the tiles, the tile space or any portion thereof. A user can customize appearance of tile space and tiles based upon aesthetic preferences or to enhance usability. For instance, individual tile spaces, tile space zones or tiles can have separate colors, themes or skins to allow a user to identify a tile, tile space or location within a tile space at a glance.

The user interface can enhance navigation of the tile space by providing users with a method for returning to a home location or tile, such as the center or center tile of the tile space. For example, the user interface can include a button that immediately jumps or warps to the tile space home. Return to the tile space home can be triggered using a button, a stylus or any other method of input for the mobile device.

Referring now to FIG. **9**, an exemplary display **900** depicting a zoomed out display of the tile space is illustrated. The navigation component can provide a zoom function. Zooming out allows a user to determine current location within the tile space. While in the zoom out view, the user can select an alternate portion of the tile space for viewing. After selecting a portion of the tile space, the user can elect to zoom in. At that point the display component will update the display to view the portion of the tile space selected by the user. During zoom out, smaller representations of tiles can be used to allow for the display of additional tiles within the display screen of the mobile device. The zoom out display need not include an active tile. The smaller tile representations can include graphics or any visual indicia. In addition, a display screen indicator (not shown) can be illustrated on the screen. The display screen indicator can be drawn as a box or border showing the portion of the tile space to be displayed upon zoom in. By indicating movement, the user can reposition the display screen indicator within the tile space and thereby update the portion of the tile space to be displayed. Alternatively, the user can select a tile and on zoom in, the selected tile can be displayed as the active tile, centered in the mobile device display screen.

Tiles can be organized within the tile space in any manner that enhances usability for a user. For example, users can manually place or position each tile within the tile space. Tiles associated with a class of information can be grouped together. For example, a user can have several tiles devoted to persons. The user may wish to group all such tiles within the tile space. Consequently, the user can navigate to the portion of the tile space containing the tiles devoted to people to determine the status of all of the contacts at one time. Grouping related tiles can be used in combination with the zones or quadrants described above. For example, the users may elect to position all contact tiles within the upper left quadrant of the tile space. Work-related tiles can be grouped in the bottom right quadrant of the tile space, and so forth. Consequently, background color can indicate not only location within the tile space, but also the type of tile.

Alternatively or additionally, tile position component can automatically organize or place tiles. The tile position component can infer appropriate groups or clusters of tiles based upon the class of information reference by the tiles (e.g., contacts, games and the like), or by any other metadata associated with a tile. Tiles can have a gravity or magnetism based upon any metadata such as tile origin, tile content, user classification of the tile or any other data. Like tiles can gravitate toward each other based upon this gravity or magnetism. Tile magnetism can be used in combination with user classifications or selections to maintain order and organization within the tile space. In particular, as tiles are deleted and added to the tile space, tile clustering using magnetism can facilitate maintaining order within the tile space. Automatic tile management can help prevent cluttering and randomization of the tile space.

The aforementioned systems have been described with respect to interaction between several components. It should be appreciated that such systems and components can include those components or sub-components specified therein, some of the specified components or sub-components, and/or additional components. Sub-components could also be implemented as components communicatively coupled to other components rather than included within parent components. Additionally, it should be noted that one or more components may be combined into a single component providing aggregate functionality or divided into several sub-components. The components may also interact with one or more other components not specifically described herein but known by those of skill in the art.

Furthermore, as will be appreciated various portions of the disclosed systems above and methods below may include or consist of artificial intelligence or knowledge or rule based components, sub-components, processes, means, methodologies, or mechanisms (e.g., support vector machines, neural networks, expert systems, Bayesian belief networks, fuzzy logic, data fusion engines, classifiers . . .). Such components, inter alia, can automate certain mechanisms or processes performed thereby to make portions of the systems and methods more adaptive as well as efficient and intelligent.

In view of the exemplary systems described supra, methodologies that may be implemented in accordance with the disclosed subject matter will be better appreciated with reference to the flowcharts of FIGS. **10-13**. While for purposes of simplicity of explanation, the methodologies are shown and described as a series of blocks, it is to be understood and appreciated that the claimed subject matter is not limited by the order of the blocks, as some blocks may occur in different orders and/or concurrently with other blocks from what is depicted and described herein. Moreover, not all illustrated blocks may be required to implement the methodologies described hereinafter.

Additionally, it should be further appreciated that the methodologies disclosed hereinafter and throughout this specification are capable of being stored on an article of manufacture to facilitate transporting and transferring such methodologies to computers. The term article of manufacture, as used, is intended to encompass a computer program accessible from any computer-readable device, carrier, or media.

Referring now to FIG. **10**, a methodology for updating a tile space in accordance with an aspect described herein is illustrated. At **1002**, a tile space is generated for a mobile device. The tile space can be of any size or configuration, such as a rectangular grid or a continuous loop. The tile space can be populated with one or more tiles at **1004**. The tiles can be placed within the tile space according to the specifications of a user. Alternatively or additionally, tiles can be placed in the tile space according to tile parameters, such as classes of data associated with the tiles. The tile space can be larger than the available screen of the mobile device. Accordingly, a view of the tile space can include a selected portion of the tile space. The portion of the tile space shown in the mobile device screen can be determined based upon user input. Alternatively, a default portion of the tile space can be shown. A view of the tile space can be displayed on the screen of the mobile device at **1006**.

Referring now to FIG. **11**, a methodology for updating a tile space in response to user input in accordance with an aspect described herein is illustrated. At **1102**, user input is received. User input can be provided using a keypad, an

on-screen button, a joystick and the like. For example, with a multi-directional pad either on-screen or mapped to a keypad or joystick, the user can nudge or move in a desired direction to see other tiles or collections of tiles. The method navigates through the tile space in accordance with user input at **1104**. Based upon navigation of the tile space, the active tile and the background tiles visible on screen can be determined. The view dependent at least in part upon the user's input can be displayed at **1106**.

Referring now to FIG. **12**, a methodology for updating a tile space in accordance with an aspect described herein is illustrated. At **1202**, an update of the tiles, including both the active tile and the background tiles, is triggered. Updates can be triggered by user input such as addition, deletion or modification of tiles. Tiles can also be updated periodically. Tile updates can also be triggered by changes in content associated with the tiles. The content associated with a tile can be obtained at **1204**. Content can be obtained upon request. At **1206**, the tiles and tile space can be updated based upon the updated content. At **1208**, a determination is made as to whether there are additional tiles for which updated content should be retrieved. If yes, the method returns to **1204** and updated information is obtained for the next tile. If no, the display can be updated at **1210** to show the updated tile space.

Referring now to FIG. **13**, a methodology for updating a tile space based upon a user profile in accordance with an aspect described herein is illustrated. At **1302**, a user profile can be selected from one or more possible user profiles. User profiles can define the tiles available for display on the mobile device and can be specified to provide the user with relevant content based upon the user's context. Selection of a user profile can be based upon location of the mobile device, time of day, day of the week or any other relevant information. At **1304**, the tiles to be displayed are selected based upon the user profile. The view of tile space is determined at **1306**. For example, the display tiles can include a default tile, such that the display is centered on the default tile. At **1308**, the tile space can be updated in accordance with the selected user profile.

In order to provide a context for the various aspects of the disclosed subject matter, FIGS. **14** and **15** as well as the following discussion are intended to provide a brief, general description of a suitable environment in which the various aspects of the disclosed subject matter may be implemented. While the subject matter has been described above in the general context of computer-executable instructions of a computer program that runs on a mobile device including a computer and/or computers, those skilled in the art will recognize that the innovations described herein also may be implemented in combination with other program modules or software applications. Generally, program modules include routines, programs, components, data structures, etc. that perform particular tasks and/or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the inventive methods may be practiced with other computer system configurations, including single-processor or multiprocessor computer systems, mini-computing devices, mainframe computers, as well as personal computers, hand-held computing devices (e.g., PDA, phone, watch . . .), microprocessor-based or programmable consumer or industrial electronics, and the like. The illustrated aspects may also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. However, some, if not all aspects of the subject matter described herein can be practiced on stand-alone computers, including mobile devices. In a distributed computing environment, program modules may be located in both local and remote memory storage devices.

With reference again to FIG. **14**, the exemplary environment **1400** for implementing various aspects of the embodiments includes a mobile device or computer **1402**, the computer **1402** including a processing unit **1404**, a system memory **1406** and a system bus **1408**. The system bus **1408** couples system components including, but not limited to, the system memory **1406** to the processing unit **1404**. The processing unit **1404** can be any of various commercially available processors. Dual microprocessors and other multi-processor architectures may also be employed as the processing unit **1404**.

The system memory **1406** includes read-only memory (ROM) **1410** and random access memory (RAM) **1412**. A basic input/output system (BIOS) is stored in a non-volatile memory **1410** such as ROM, EPROM, EEPROM, which BIOS contains the basic routines that help to transfer information between elements within the computer **1402**, such as during start-up. The RAM **1412** can also include a high-speed RAM such as static RAM for caching data.

The computer or mobile device **1402** further includes an internal hard disk drive (HDD) **1414** (e.g., EIDE, SATA), which internal hard disk drive **1414** may also be configured for external use in a suitable chassis (not shown), a magnetic floppy disk drive (FDD) **1416**, (e.g., to read from or write to a removable diskette **1418**) and an optical disk drive **1420**, (e.g., reading a CD-ROM disk **1422** or, to read from or write to other high capacity optical media such as the DVD). The hard disk drive **1414**, magnetic disk drive **1416** and optical disk drive **1420** can be connected to the system bus **1408** by a hard disk drive interface **1424**, a magnetic disk drive interface **1426** and an optical drive interface **1428**, respectively. The interface **1424** for external drive implementations includes at least one or both of Universal Serial Bus (USB) and IEEE **1494** interface technologies. Other external drive connection technologies are within contemplation of the subject systems and methods.

The drives and their associated computer-readable media provide nonvolatile storage of data, data structures, computer-executable instructions, and so forth. Consequently, the tile instructions can be stored using the drives and their associated computer-readable media. For the computer **1402**, the drives and media accommodate the storage of any data in a suitable digital format. Although the description of computer-readable media above refers to a HDD, a removable magnetic diskette, and a removable optical media such as a CD or DVD, it should be appreciated by those skilled in the art that other types of media that are readable by a computer, may be used.

A number of program modules can be stored in the drives and RAM **1412**, including an operating system **1430**, one or more application programs **1432**, other program modules **1434** and program data **1436**. The application programs **1432** can provide content for the tiles. All or portions of the operating system, applications, modules, and/or data can also be cached in the RAM **1412**. It is appreciated that the systems and methods can be implemented with various commercially available operating systems or combinations of operating systems.

A user can enter commands and information into the computer **1402** through one or more wired/wireless input devices, e.g. a keyboard **1438** and a pointing device, such as a mouse **1440**. Other input devices (not shown) may include a microphone, an IR remote control, a joystick, a game pad, a stylus pen, touch screen, or the like. These and other input devices are often connected to the processing unit **1404** through an

input device interface **1442** that is coupled to the system bus **1408**, but can be connected by other interfaces, such as a parallel port, an IEEE **1494** serial port, a game port, a USB port, an IR interface, etc. A display device **1444** can be used to provide a set of tiles to a user. The display devices can be connected to the system bus **1408** via an interface, such as a video adapter **1446**.

The mobile device or computer **1402** may operate in a networked environment using logical connections via wired and/or wireless communications to one or more remote computers, such as a remote computer(s) **1448**. For example, the tile instructions can be local to the computer **1402** and software applications can be located remotely on a remote computer **1448**. The remote computer(s) **1448** can be a workstation, a server computer, a router, a personal computer, portable computer, microprocessor-based entertainment appliance, a peer device or other common network node, and typically includes many or all of the elements described relative to the computer **1402**, although, for purposes of brevity, only a memory/storage device **1450** is illustrated. The logical connections depicted include wired/wireless connectivity to a local area network (LAN) **1452** and/or larger networks, e.g. a wide area network (WAN) **1454**. Such LAN and WAN networking environments are commonplace in offices and companies, and facilitate enterprise-wide computer networks, such as intranets, all of which may connect to a global communications network, e.g., the Internet.

When used in a LAN networking environment, the computer **1402** is connected to the local network **1452** through a wired and/or wireless communication network interface or adapter **1456**. The adaptor **1456** may facilitate wired or wireless communication to the LAN **1452**, which may also include a wireless access point disposed thereon for communicating with the wireless adaptor **1456**.

When used in a WAN networking environment, the computer **1402** can include a modem **1458**, or is connected to a communications server on the WAN **1454**, or has other means for establishing communications over the WAN **1454**, such as by way of the Internet. The modem **1458**, which can be internal or external and a wired or wireless device, is connected to the system bus **1408** via the serial port interface **1442**. In a networked environment, program modules depicted relative to the computer **1402**, or portions thereof, can be stored in the remote memory/storage device **1450**. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers can be used.

The computer **1402** is operable to communicate with any wireless devices or entities operatively disposed in wireless communication, e.g., a printer, scanner, desktop and/or portable computer, PDA, communications satellite, any piece of equipment or location associated with a wirelessly detectable tag (e.g. a kiosk, news stand, restroom), and telephone. The wireless devices or entities include at least Wi-Fi and Bluetooth™ wireless technologies. Thus, the communication can be a predefined structure as with a conventional network or simply an ad hoc communication between at least two devices.

Wi-Fi, or Wireless Fidelity, allows connection to the Internet from a couch at home, a bed in a hotel room, or a conference room at work, without wires. Wi-Fi is a wireless technology similar to that used in a cell phone that enables such devices, e.g., computers, to send and receive data indoors and out; anywhere within the range of a base station. Wi-Fi networks use radio technologies called IEEE 802.11 (a, b, g, etc.) to provide secure, reliable, fast wireless connectivity. A Wi-Fi network can be used to connect computers to each other, to the Internet, and to wired networks (which use IEEE 802.3 or Ethernet). Wi-Fi networks operate in the unlicensed 2.4 and 5 GHz radio bands, at an 11 Mbps (802.11a) or 54 Mbps (802.11b) data rate, for example, or with products that contain both bands (dual band), so the networks can provide real-world performance similar to the basic 10BaseT wired Ethernet networks used in many offices.

FIG. **15** is a schematic block diagram of a sample environment **1500** with which the systems and methods described herein can interact. The system **1500** includes one or more mobile device(s) **1502**. The mobile device(s) **1502** can be hardware and/or software (e.g. threads, processes, computing devices). The system **1500** also includes one or more server(s) **1504**. Thus, system **1500** can correspond to a two-tier client server model or a multi-tier model (e.g., client, middle tier server, data server), amongst other models. The server(s) **1504** can also be hardware and/or software (e.g., threads, processes, computing devices). One possible communication between a mobile device **1502** and a server **1504** may be in the form of a data packet adapted to be transmitted between two or more computer processes. The system **1500** includes a communication framework **1506** that can be employed to facilitate communications between the mobile device(s) **1502** and the server(s) **1504**. The mobile device(s) **1502** are operably connected to one or more data store(s) **1508** that can be employed to store information local to the mobile device(s) **1502**. Similarly, the server(s) **1504** are operably connected to one or more server data store(s) **1510** that can be employed to store information local to the servers **1504**.

The disclosed subject matter may be implemented as a system, method, apparatus, or article of manufacture using standard programming and/or engineering techniques to produce software, firmware, hardware, or any combination thereof to control a computer or processor based device to implement aspects detailed herein. The term "article of manufacture" (or alternatively, "computer program product") as used herein is intended to encompass a computer program accessible from any computer-readable device, carrier, or media. For example, computer readable media can include but are not limited to magnetic storage devices (e.g., hard disk, floppy disk, magnetic strips . . .), optical disks (e.g. compact disk (CD), digital versatile disk (DVD) . . .), smart cards, and flash memory devices (e.g., card, stick). Additionally it should be appreciated that a carrier wave can be employed to carry computer-readable electronic data such as those used in transmitting and receiving electronic mail or in accessing a network such as the Internet or a local area network (LAN). Of course, those skilled in the art will recognize many modifications may be made to this configuration without departing from the scope or spirit of the claimed subject matter.

What has been described above includes examples of aspects of the claimed subject matter. It is, of course, not possible to describe every conceivable combination of components or methodologies for purposes of describing the claimed subject matter, but one of ordinary skill in the art may recognize that many further combinations and permutations of the disclosed subject matter are possible. Accordingly, the disclosed subject matter is intended to embrace all such alterations, modifications and variations that fall within the spirit and scope of the appended claims. Furthermore, to the extent that the terms "includes," "has" or "having" are used in either the detailed description or the claims, such terms are intended to be inclusive in a manner similar to the term "comprising" as "comprising" is interpreted when employed as a transitional word in a claim.

What is claimed is:

1. A user interface for a mobile device facilitating surfacing of content available through the mobile device, comprising:

an interface component that obtains the content;

a tile space component that manages a plurality of tiles dynamically updated based at least in part on the content and the plurality of tiles positioned within a tile space, wherein the tile space component includes a profile component that manages at least one user profile and the plurality of tiles are selected from a set of available tiles based at least in part on the at least one user profile; and

a display component that displays a view of the tile space.

2. The user interface of claim 1, wherein the plurality of tiles includes an application tile that provides a link to a software application.

3. The user interface of claim 1, wherein the content is local to the mobile device.

4. The user interface of claim 1, wherein the plurality of tiles includes an independent tile that provides functionality independent of other mobile device applications.

5. The user interface of claim 1, wherein the tile space is divided into a plurality of visually distinct zones.

6. The user interface of claim 1, wherein the tile space component further comprises an available tile component that manages a set of available tiles and a display tile component that manages the plurality of tiles selected from the set of available tiles.

7. The user interface of claim 6, wherein the at least one user profile is based upon one or more of a geographic location, time, and date.

8. The user interface of claim 1, wherein the tile space component further comprises a tile position component that manages the position of each of the plurality of tiles within the tile space.

9. The user interface of claim 8, wherein the positioning of the plurality of tiles in the tile space is based at least in part on metadata associated with each of the plurality of tiles.

10. The user interface of claim 8, wherein the positioning of the plurality of tiles in the tile space is based at least in part on user input.

11. A processor-implemented method, comprising:

a processor generating a customizable display space capable of managing a plurality of dynamically updating tiles;

the processor populating the customizable display space with the plurality of tiles, wherein the plurality of tiles are selected from a set of available tiles based at least in part on at least one user profile; and

displaying a view of the display space on a display screen of a mobile device.

12. The method of claim 11, further comprising receiving user input and the processor navigating through the display space based at least in part on the user input.

13. The method of claim 12, wherein navigating through the display space comprises panning through the display space and selecting an active tile for display in a summary view.

14. The method of claim 13, wherein panning through the display space comprises wrapping from one edge of the display space to an opposite edge of the display space such that the display space forms a continuous loop.

15. The method of claim 12, wherein navigating through the display space further comprises zooming between different zoom depths within the display space.

16. The method of claim 11, wherein displaying a view of the display space further comprises selecting an active tile from the plurality of tiles and displaying an enlarged, summary view of the active tile.

17. A system comprising a processor and a computer-readable storage device, the device storing executable instructions that when processed by said processor cause said processor to implement the steps comprising:

generating a customizable tile space capable of managing a plurality of tiles;

populating the customizable tile space with the plurality of tiles;

selecting one or more tiles from a set of available tiles based at least in part on a user profile;

dynamically updating the plurality of tiles with the one or more selected tiles based at least in part on content of the selected one or more tiles; and

displaying a view of the tile space.

18. The system of claim 17, wherein said processor processes said executable instructions to further implement the steps comprising receiving user input navigating through the tile space based at least in part on the user input.

19. The system of claim 17, wherein the user profile is based upon one or more of a geographic location, time, and date.

20. The system of claim 17, wherein said processor processes said executable instructions to further implement the steps comprising panning through the tile space and selecting a tile from the plurality of tiles for an enlarged view.

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