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[Continued on next page]

(54) Title: ADJUSTING PRESENTATION OF A USER INTERFACE

(57) Abstract: Example implementations relate to a user interface (UI). For example, different ranges of values of a variable of a constraint correspond to different templates of multiple templates each specifying a respective arrangement of the UI. Based on the received value of the variable, a template of the plurality of templates is selected. The UI is presented using an arrangement according to the selected template. After the presenting of the UI, in response to a variation in value of the variable that stays within the range of values of the variable for the selected template, the arrangement of the UI according to the selected template is maintained, and a presentation of the UI is adjusted according to the variation in value of the variable.

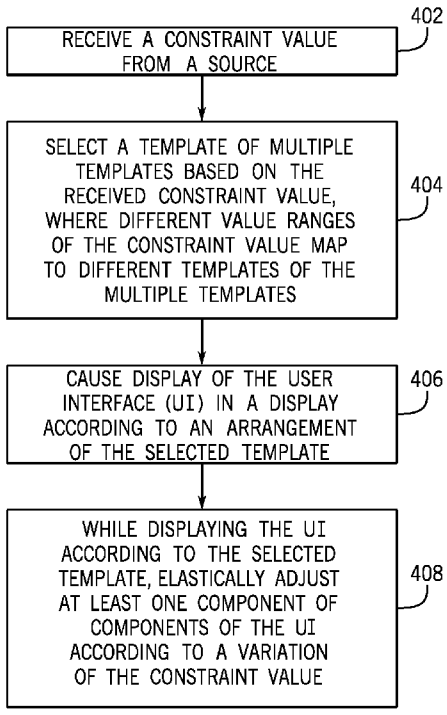


FIG. 4

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ADJUSTING PRESENTATION OF A USER INTERFACE

Background

[0001] Program code that includes machine-readable instructions (e.g. an application, an operating system, firmware code, etc.) can present a user interface (UI) through which a user can interact with the program code. The UI can include various control elements that can be selected by the user to control operation of the program code. In addition, the UI can present information related to the program code, such as information produced by the program code during operation, or other information.

Brief Description Of The Drawings

[0002] Some implementations are described with respect to the following figures.

[0003] Fig. 1 is a block diagram of an example electronic device, according to some implementations.

[0004] Figs. 2 and 3A-3D illustrate various different example arrangements of user interfaces (UIs) provided by an elastic UI framework, according to some implementations.

[0005] Fig. 4 is a flow diagram of an example process, according to some implementations.

[0006] Fig. 5 is a block diagram of an example electronic device, according to further implementations.

Detailed Description

[0007] When a user interacts with a user interface (UI), the context of the user interaction may change. For example, the user may resize a window in the UI. As another example, the user may change devices, such as changing from using a desktop computer to display the UI to using a smart phone to display the UI. This change in electronic device can result in a change in a size of a display screen

available to display the UI. As a further example, the ambient light condition may change (e.g. the ambient light around the electronic device displaying the UI may transition from a higher ambient light condition to a lower ambient light). The size of a UI window, the type of electronic device, and the ambient light condition are examples of variables that can affect how a UI is to be presented. "Presenting" a UI can refer to rendering the UI for display. There can be other variables that affect how the UI is to be presented, as discussed further below.

[0008] In some cases, it may be possible to adjust a specific characteristic of a UI in response to a change in a variable. For example, as the width of a UI window narrows (where the width is an example of a variable), the layout (where the layout is an example of a characteristic of the UI) of information content displayed in the UI window can be changed (e.g. reflow the information content in a narrower column for display). However, as a value of a variable that may affect presentation of a UI varies across a wider range, merely reflowing the information content of the UI may not produce a desirable user experience, such as when a portion of the information content is cut off and becomes no longer visible.

[0009] In accordance with some implementations of the present disclosure, an elastic UI framework is provided that accommodates changes in variables of a constraint across a wider range. The elastic UI framework can include techniques and/or mechanisms that provide for elastic adjustment of a UI in response to changes in the constraint. An elastic adjustment of a UI can refer to a gradual or incremental change of the UI in response to change in value of a variable, or alternatively, in response to changes in values of multiple variables.

[0010] A constraint can include a variable that affect presentation of a UI in a display. In other examples, a constraint can include a set of variables that affect presentation of the UI in the display. The constraint can be associated with multiple templates, where each template specifies a respective different arrangement of the UI. An "arrangement" of a UI can refer to an ordering of multiple components of the UI, a visibility of the multiple components (which specifies whether each respective

component is visible, hidden, or partially hidden), a characteristic of each component, and so forth.

[0011] A component can refer to any separately definable portion of the window in which information content can be presented. As an example, a component can be a sub-window within a larger window of a UI. As another example, a component can include a control button, a menu, a text element, an entry field, and so forth.

[0012] In some implementations, a template can include a style or a set of styles for a component, or alternatively, for multiple components of a window in the UI. A window can refer to a region of the UI in which information content can be displayed. A window can include a component, or alternatively, can include multiple components. If the window of the UI includes multiple components, then multiple styles are provided in the set of styles of each respective template.

[0013] In some examples, a style of a template can be according to a style sheet language, such as the Cascading Style Sheets (CSS) language, the Extensible Style sheet Language (XSL) language, or other language. A style sheet language expresses the presentation of a document, such as a document written according to a markup language that defines the various components of the UI 110. Examples of markup languages include the Hypertext Markup Language (HTML), the Extensible Hypertext Markup Language (XHTML), and so forth.

[0014] Examples of characteristics of a component that can be adjusted using the elastic UI framework can include any or some combination of the following: a component size, a brightness, a font of text, a size of an image, a size of a container in which information content is presented, a color, a layout of information content, and so forth. A component size can refer to a width, height, or other dimension of a component. A brightness can refer to how brightly information content in a component is displayed. A font can refer to a size and/or style of font of text in a container. A size of an image can refer to a size of an image element (e.g. size of an icon). A size of a container can refer to a size of a structure that is used to hold information content to be displayed (the container can have a width and/or height

that can be adjusted as a component changes in size. A color can refer to a color scheme, including a color, or alternatively, multiple colors, used by a component. A layout of information content can refer to how the information content is presented (e.g. the information content is to be displayed within a column of a specified width, such that a change in the column width can cause the information content to be reflowed to fit within the changed column width). In further examples, there can be additional or alternative characteristics.

[0015] The multiple templates are associated with respective different ranges of values of at least one variable of the constraint. As the constraint changes (i.e. the value of a variable of the constraint changes or the values of multiple variables of the constraint change), the presentation of an elastic UI can be modified accordingly. For example, if the change in the constraint causes the value of the at least one variable to transition from being in a first range of values (corresponding to a first template) to a second range of values (corresponding to a second template), then the presentation of the UI can change from an arrangement according to the first template to an arrangement according to the second template.

[0016] However, if the constraint changes such that the value of the at least one variable stays within a given range that corresponds to a current template that governs presentation of the elastic UI, then the elastic UI can change at least one characteristic of the UI within bounds specified by the current template, while maintaining the arrangement according to the current template. However, as the constraint changes in value to fall outside the given range, then the elastic UI can be presented using another template.

[0017] Fig. 1 is a block diagram of an example electronic device 100 that includes a processor 102 that is coupled to a storage medium 104 and a display 106. Although just one processor 102 and one storage medium 104 is shown in Fig. 1, it is noted that the electronic device 100 can include multiple processors and/or multiple storage media in other examples. A processor can refer to a microprocessor, a core of a multi-core processor, a microcontroller, a programmable gate array (PGA), an application-specific integrated circuit (ASIC), or other

processing hardware. The elastic UI framework according to some implementations can be implemented using processing hardware, such as the processor(s) 102, or can be implemented as a combination of processing hardware and machine-readable instructions executable on the processing hardware.

[0018] Examples of the electronic device include a desktop computer, a notebook computer, a tablet computer, a smart phone, a game appliance, a television set-top box, a wearable device (e.g. smart watch, smart eyeglasses, etc.), a vehicle, or any other type of electronic device.

[0019] Although Fig. 1 shows the display 106 as being part of the electronic device 100, it is noted that in other examples, the display 106 can be external of the electronic device 100, and in some cases may be coupled to the electronic device 100 over a network, such as a local area network (LAN), a wide area network (WAN), the Internet, a wireless network, and so forth.

[0020] The storage medium 104 stores multiple templates 108 , where each template specifies a respective different arrangement of a UI 110 that can be presented for display at the display 106.

[0021] As shown in Fig. 1, the processor 102 can receive a constraint value 112. As noted above, a constraint can include one variable or alternatively, multiple variables. Thus, a “constraint value” can refer to a value of a variable of the constraint, or alternatively, values of multiple variables of the constraint. The constraint value 112 can be received from at least one source, where at least one source can refer to a source, or alternatively, to multiple sources.

[0022] The templates 108 are associated with respective different value ranges of the constraint value 112. A value range includes a collection of values of at least on variable of the constraint. A first template 108 corresponds to a first value range of the constraint value 112, a second template corresponds to a second value range of the constraint value 112, and so forth. In examples where the constraint includes multiple variables, each variable can be associated with respective different value

ranges that correspond to the different templates. In such cases, the processor 102 considers the respective different values of the multiple variables of the constraint to select one of the templates 108 according to which value ranges the respective variables fall into.

[0023] Examples of a variable of a constraint can include any of the following: a size of a window of a UI, a size of a display screen, a type of electronic device, a location of the electronic device, a level of ambient light, a speed of the electronic device, a vibration level of the electronic device, a security level of information content, and a characteristic of a user of the electronic device.

[0024] For example, a monitoring agent can monitor a width or other dimension of a window of the UI 110. The monitoring agent that is able to monitor the width or other dimension (e.g. aspect ratio) of the window of the UI 110 can be part of a program code (including machine-readable instructions) that presents the UI 110, such as an application, an operating system, firmware, and so forth.

[0025] The monitoring agent can also determine a size of a display screen, such as by accessing configuration data stored in the electronic device 100. The configuration data can include various configuration parameters, where one of the configuration parameters can indicate a size of the display screen. As another example, the monitoring agent can determine a type of the electronic device 100, which can be accomplished by accessing a configuration parameter of configuration data stored in the electronic device 100.

[0026] A location of the electronic device 100 can be determined from a locating agent in the electronic device 100, where the locating agent can include a global positioning system (GPS) receiver that can provide coordinates of the location of the electronic device, or a cellular network-based location mechanism that can determine the location of the electronic device 100 using triangulation with cellular base stations or wireless access network nodes. As an example, if the constraint value 112 indicates that the electronic device 100 is located at a work location of a user, then the processor 102 can present the elastic UI 110 in a first manner (e.g.

according to a first template). However, if the constraint value 112 indicates that the electronic device 100 is located outside a work location of a user, then the processor 102 can present the elastic UI 110 in a different manner (e.g. according to a second template).

[0027] The level of ambient light around the electronic device 100 can be indicated by the output of a light sensor of the electronic device 100. If the ambient light is low, then the processor 102 can select a template or adjust a characteristic of the UI 110 such that information content is more visible (e.g. select the template or adjust the characteristic to increase the brightness, increase the font size, reduce the number of visible components, etc.).

[0028] The speed of the electronic device 100 can be indicated using the output of a sensor, or alternatively, from multiple sensors of the electronic device 100. Such sensor(s) can include an accelerometer, a locating agent such as a GPS receiver or a cellular network-based location mechanism, a gyroscope, a compass, and so forth. In some cases, a user may be stationary while using the electronic device 100. In other cases, the user may be moving at a higher speed, such as when the user is walking or jogging, which may make reading more difficult. If the electronic device 100 is stationary or has a speed less than a specified speed threshold, then the processor 102 can select a template or adjust a characteristic of the UI 110 such that more information content is visible (e.g. select the template or adjust the characteristic to reduce the font size, increase the number of visible components, etc.). On the other hand, if the electronic device 100 is moving at a speed that exceeds the specified speed threshold, then the processor 102 can select a template or adjust a characteristic of the UI 110 such that information content is more readable (e.g. select the template or adjust the characteristic to increase the brightness, increase the font size, reduce the number of visible components, etc.).

[0029] The vibration level of the electronic device 100 can be indicated using an accelerometer in the electronic device 100. If the electronic device 100 is vibrating, then that can indicate that the user is in an environment (such as in a car that is moving) that can make reading information content more difficult. A higher vibration

level of the electronic device 100 can also indicate that the user of the electronic device 100 may have a disability. Thus, in response to detecting a higher vibration level (that exceeds a specified vibration threshold), the processor 102 can select a template or adjust a characteristic of the UI 110 such that information content is more readable.

[0030] The security level of information content presented by the UI 110 can be determined based on metadata (e.g. tags) associated with the information content. The metadata can indicate whether the associated information content has a higher security level (e.g. confidential business information of an enterprise, secret information of a government agency, personal information such as social security number, passwords, user names, and so forth of a user, etc.). In response to detecting that information content of a higher security level is being presented by the UI 110, the processor 102 can select a template or adjust a characteristic of the UI 110 such that information content is made less visible to other people who may be around the user (e.g. the processor 102 can select a template or adjust a characteristic to reduce a font size, reduce a size of an image element, reduce a brightness, etc.).

[0031] The characteristic of a user of the electronic device 100 can be determined based on login information of the user (entered by the user to log into the electronic device 100), biometric identification of the user based on a biometric sensor (e.g. fingerprint sensor, facial recognition application, etc.) of the electronic device 100. The electronic device 100 can store various user profiles for different users, where these profiles can specify preferences of the user with respect to the UI 110. For a first user, the processor 102 can present the UI 110 using a first template or a particular characteristic, and for a second user, the processor 102 can present the UI 110 using a second template or a different characteristic.

[0032] Fig. 2 is a block diagram of components of a UI window 200. The window depicted in Fig. 2 includes the following components: a navigation bar 202, a top menu bar 204, a list view 206, and a body 208. The navigation bar 202 can include various icons that are selectable by a user to navigate the user to different pages, for

example. The list view 206 lists various items that can contain information content, where the items can include email messages, calendar events, tasks, files, and so forth. The top menu bar 204 can include menus that are selectable by a user to pull up respective menu items that can be selected by the user to cause the information content of the UI window 200 to change.

[0033] The body component 208 can display information content, such as information of an item selected in the list view 206 selected by the user. For example, if an email message in the list view 206 is selected, then the body 208 can display the content of the email message. As another example, if a calendar event in the list view 206 is selected, then the body 208 can display the content of the calendar event. As a further example, if a file in the list view 206 is selected, then the content of the file (e.g. a word-processing document, a spreadsheet, etc.) can be displayed in the body 208.

[0034] The arrangement of the components depicted in Fig. 2 can be controlled differently by respective different templates (e.g. 108 of Fig. 1). Fig. 2 shows an example arrangement of the components 202, 204, 206, and 208 of the UI window 200 in an example where a constraint value falls within a value range of a first template. In Fig. 2, the UI window 200 has a first width W1 (where this UI width is an example of a variable of the constraint).

[0035] As the UI width changes from W1 to W2 (where both W1 and W2 remain in the value range for the first template), a characteristic of at least one of the components 202, 204, 206, and 208 can change, to the arrangement shown in Fig. 3A. In some examples, the top menu bar component 204 and the body component 208 are flexible components that can change in characteristic with a change in the constraint value (in this example, the UI window width). In Fig. 3A, the width of the UI window 200 is W2, which is less than W1. In response to the reduction of the UI window width, the top menu bar 204 and the body 208 are reduced in width, where,the width is an example of a characteristic of components (e.g. components 204 and 208 in this case that can be changed). Any information content displayed in the top menu bar 204 and the body 208 can be reflowed to fit within the reduced

widths of the top menu bar 204 and the body 208. The reflowing of the information content can be performed by a rendering engine of an application, such as the rendering engine of a web browser or other rendering engine. In addition to reflowing content, a text font and/or an image size can be reduced in the top menu bar 204 and the body 208 as the UI window width is reduced.

[0036] If the change in the constraint value causes the constraint value to transition from the first range corresponding to the first template to a second value range corresponding to a second template, then the second template is selected to present the UI window 200. For example, the window width may have been reduced even further such that the first template is no longer applicable. This changing of the width can be caused by a user resizing the UI window, or alternatively, the user using a different electronic device to display the UI window. For example, the user may have initially been viewing the UI on a notebook computer or desktop computer with a large display screen, and later, may decide to use a tablet computer to display the UI, where the tablet computer has a display screen size that is smaller than that of the desktop computer or notebook computer.

[0037] Fig. 3B shows a modified UI window 200-1 that has been reduced further in width to W3, which is less than W2. The width W3 falls within the second value range corresponding to the second template. As a result, the second template is selected to present the components 202, 204, 206, and 208. In the UI window 200-1, the list view 206 can become a recessed list view, which is recessed to a narrow width as shown in Fig. 3B. A portion of the list view 206 is hidden when the list view 206 is recessed as shown in Fig. 3B. More specifically, in the example of Fig. 3B, the information items of the list view 206 may not be visible.

[0038] When a user selects the recessed list view 206 of Fig. 3B (such as by moving a pointer over the recessed list view 206 using an input device such as a mouse device or touch pad, or touching the recessed list view 206 on a touchscreen), the list view 206 expands as shown in Fig. 3C, such that the information items of the list view 206 become visible.

[0039] When the display width reduces even further and falls outside the value range for the second template and into a third value range for a third template, then the third template can be selected to present the UI window, such as further modified UI window 200-2 shown in Fig. 3D. The width of the UI window 200-2 is W4, which is less than W3. The width W4 falls in the third value range for the third template. For example, the user may have changed to using a smart phone to view the UI 110. The smart phone has a reduced display screen width which causes the UI window 200-2 to be displayed with the reduced width W4. As another example, the user may have reduced the UI window width further to W4. As shown in Fig. 3D, the UI window 200-2 according to the third template has a different arrangement of the components. In Fig. 3D, the navigation bar 202 has become horizontal, rather than vertical as in Figs. 2 and 3A-3C. Also, the list view 206 (that is present in Figs. 2 and 3A-3C) becomes completely hidden in Fig. 3D. The top menu bar 204 can become a button or a reduced graphic element; when the user selects this button or graphic element, the full top menu bar 204 can appear.

[0040] Fig. 4 is a flow diagram of an example process according to some implementations. The process of Fig. 1 can be performed by an electronic device (e.g. 100), and more specifically, by elastic UI presentation instructions executable in the electronic device, such as on the processor 102 of Fig. 1.

[0041] The electronic device receives (at 402) a constraint value from a source. The received constraint value can include a value of a variable of the constraint, or values of multiple variables of the constraint. The electronic device selects (at 404) a template of multiple templates based on the received constraint value, where different value ranges of the constraint value map to different templates of the multiple templates, and where each template specifies a respective different arrangement of components of a UI. The mapping between different value ranges of the constraint value and the respective templates can be provided in a mapping data structure, e.g. a mapping table, stored by the electronic device.

[0042] The electronic device causes (at 406) display of the UI in a display according to an arrangement specified by the selected template. While displaying

the UI according to the selected template, the electronic device elastically adjusts (at 408) at least one component of the components in the UI window according to a variation of the constraint value. An elastic adjustment of a UI component can refer to a gradual or incremental change of the UI component in response to change in value of a variable, or alternatively, in response to changes in values of multiple variables.

[0043] Fig. 5 is a block diagram of an example electronic device 500 according to some implementations. The electronic device 500 includes a non-transitory machine-readable or computer-readable storage medium (or storage media) 502 which stores machine-readable instructions that are executable by the electronic device 500. The machine-readable instructions include elastic UI presentation instructions 504, where the window-presentation instructions 504 are executable to perform various tasks as discussed in the present disclosure, such as tasks according to Fig. 4 or other tasks.

[0044] The storage medium (or storage media) 502 can include any or some combination of different forms of memory including semiconductor memory devices such as dynamic or static random access memories (DRAMs or SRAMs), erasable and programmable read-only memories (EPROMs), electrically erasable and programmable read-only memories (EEPROMs) and flash memories; magnetic disks such as fixed, floppy and removable disks; other magnetic media including tape; optical media such as compact disks (CDs) or digital video disks (DVDs); or other types of storage devices. Note that the instructions discussed above can be provided on one computer-readable or machine-readable storage medium, or alternatively, can be provided on multiple computer-readable or machine-readable storage media distributed in a large system having possibly plural nodes. Such computer-readable or machine-readable storage medium or media is (are) considered to be part of an article (or article of manufacture). An article or article of manufacture can refer to any manufactured single component or multiple components. The storage medium or media can be located either in the machine

running the machine-readable instructions, or located at a remote site from which machine-readable instructions can be downloaded over a network for execution.

[0045] In the foregoing description, numerous details are set forth to provide an understanding of the subject disclosed herein. However, implementations may be practiced without some of these details. Other implementations may include modifications and variations from the details discussed above. It is intended that the appended claims cover such modifications and variations.

What is claimed is:

1. An article comprising a non-transitory machine-readable storage medium storing instructions that upon execution cause an electronic device to:

receive a value of a variable, wherein different ranges of values of the variable correspond to different templates of a plurality of templates each specifying a respective arrangement of a user interface (UI);

select, based on the received value of the variable, a template of the plurality of templates;

present the UI using an arrangement according to the selected template; and

after the presenting of the UI, in response to a variation in value of the variable that stays within the range of values of the variable for the selected template, maintain the arrangement of the UI according to the selected template, and adjust a presentation of the UI according to the variation in value of the variable.

2. The article of claim 1, wherein the variable is part of a constraint that includes a plurality of variables, and wherein the selecting of the template of the plurality of templates is further in response to a value of a second variable of the plurality of variables.

3. The article of claim 1, wherein the UI comprises a plurality of components, and wherein the adjusting of the presentation of the UI comprises adjusting at least one of the plurality of components.

4. The article of claim 3, wherein the adjusting of the at least one of the plurality of components comprises adjusting a characteristic of the at least one of the plurality of components, the characteristic selected from among a component size, a brightness, a font of text, a size of an image, a size of a container in which information content is presented, a color, and a layout of information content.

5. The article of claim 3, wherein, in response to the variation in value of the variable that stays within the range of values of the variable for the selected template, keeping another of the plurality of components unchanged.

6. The article of claim 3, wherein the selected template is a first template, and wherein the presenting of the UI using the arrangement according to the first template causes the plurality of components to be visible to a user, the instructions upon execution causing the electronic device to further:

in response to a change in value of the variable that falls outside the range of values of the variable for the first template and falls within the range of values of the variable for a second template of the plurality of templates:

select the second template, and

present the UI using an arrangement according to the second template.

7. The article of claim 6, wherein in the arrangement according to the second template, at least a portion of a first component of the plurality of components is hidden.

8. The article of claim 7, wherein the instructions upon execution cause the electronic device to further:

in response to user interaction with the UI, cause the hidden portion of the first component to become visible.

9. The article of claim 1, wherein the variable is selected from among a size of a window of the UI, a size of a display screen, a type of the electronic device, a location of the electronic device, a level of ambient light, a speed of the electronic device, a vibration level of the electronic device, a security level of information content, and a characteristic of a user of the electronic device.

10. An electronic device comprising:

a storage medium to store a plurality of templates each specifying a respective arrangement of a user interface (UI), wherein the plurality of templates are associated with respective different value ranges of at least one variable of a constraint; and

at least one processor to:

in response to the at least one variable changing in value from a first value that is in a first value range of the different value ranges to a second value that is in a second value range of the different value ranges, change from presenting the UI according to a first template of the plurality of templates to presenting the UI according to a second template of the plurality of templates; and

while presenting the UI according to the second template, elastically change at least one characteristic the UI in response to a further change in value of the at least one variable that is within the second range.

11. The electronic device of claim 10, wherein the arrangement of the UI specified by each of the plurality of templates comprises an arrangement of a plurality of components of the UI, wherein a first arrangement of the plurality of components of the UI for the first template is different from a second arrangement of the plurality of components of the UI for the second template.

12. The electronic device of claim 11, wherein a first component of the plurality of components is visible in the first arrangement, and wherein at least a portion of the first component is hidden in the second arrangement.

13. The electronic device of claim 11, wherein the elastic change of the at least one characteristic of the UI comprises a change of a characteristic of a flexible component of the plurality of components while another component of the plurality of components is maintained as unchanged.

14. A method of an electronic device, comprising:

receiving a constraint value from at least one source;

selecting a template of a plurality of templates based on the received constraint value, wherein different value ranges of the constraint value map to different templates of the plurality of templates, and wherein each template specifies a respective different arrangement of components of a user interface (UI);

causing display of the UI in a display of the electronic device according to an arrangement specified by the selected template; and

while displaying the UI according to the selected template, elastically adjusting at least one component of the components of the UI according to a variation of the constraint value.

15. The method of claim 14, wherein the receiving of the constraint value comprises receiving values of a plurality of variables.

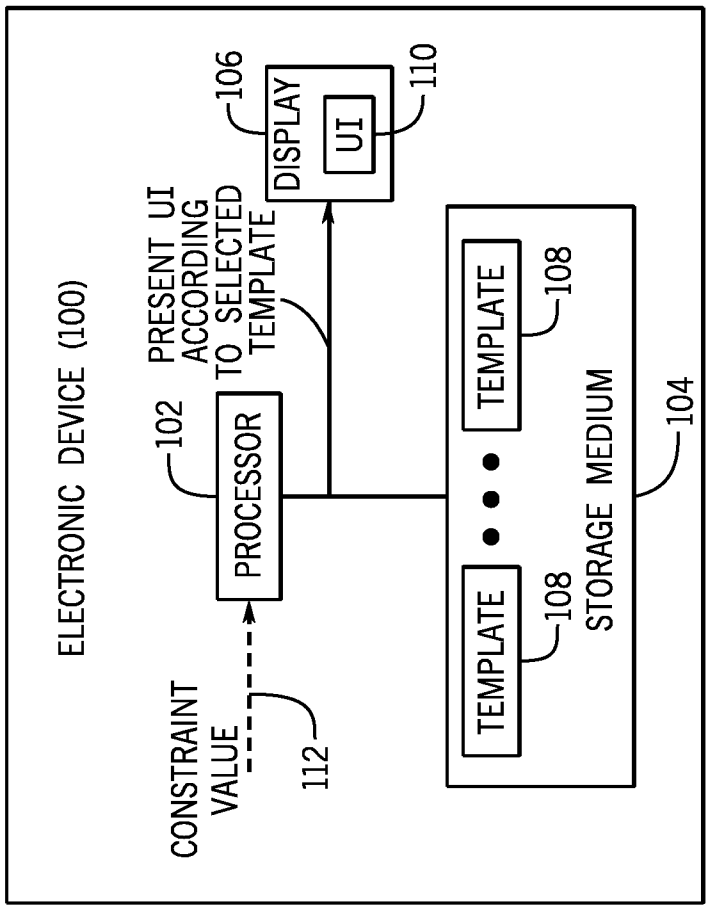

ELECTRONIC DEVICE (100)
PROCESSOR
102
CONSTRAINT VALUE
112
PRESENT UI ACCORDING TO SELECTED TEMPLATE
DISPLAY
106
UI
110
TEMPLATE
108
TEMPLATE
108
STORAGE MEDIUM
104

FIG. 1

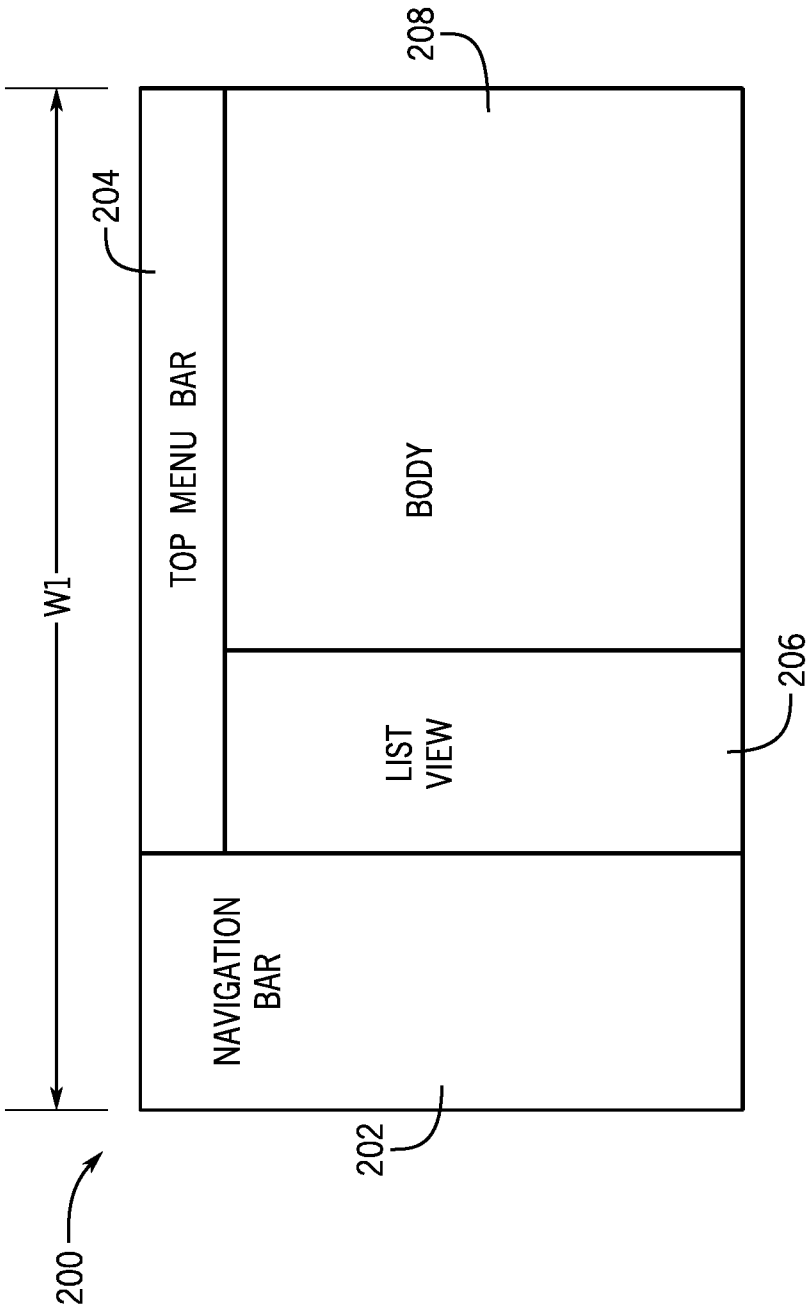

208
204
TOP MENU BAR
BODY
W1
LIST VIEW
206
NAVIGATION BAR
202
200

FIG. 2

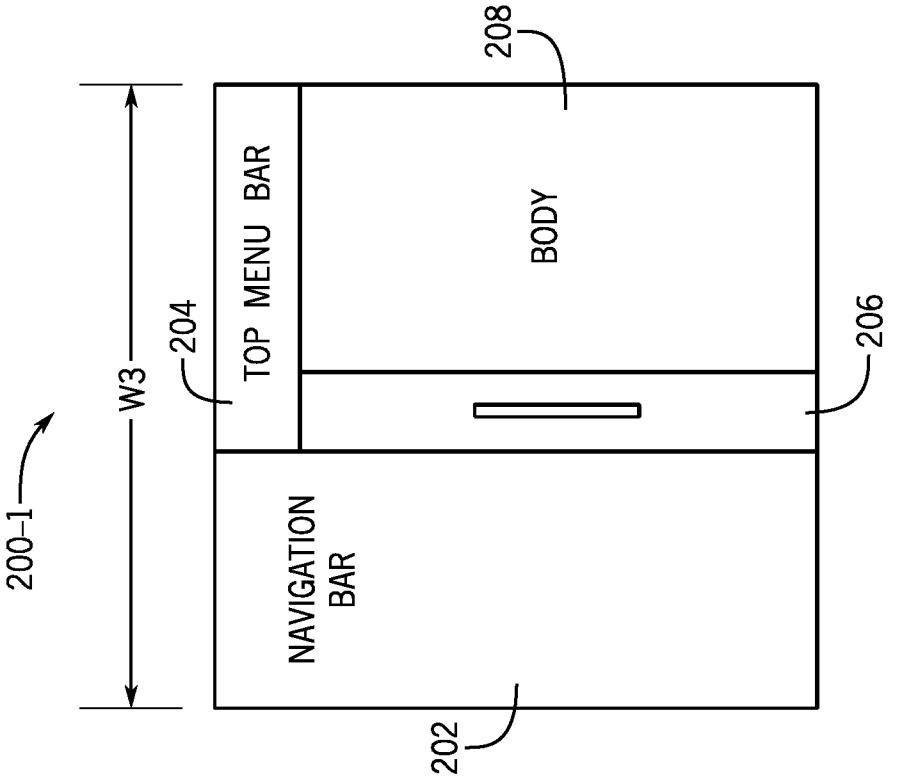

208
TOP MENU BAR
BODY
204
206
W3
200-1
NAVIGATION BAR
202

FIG. 3B

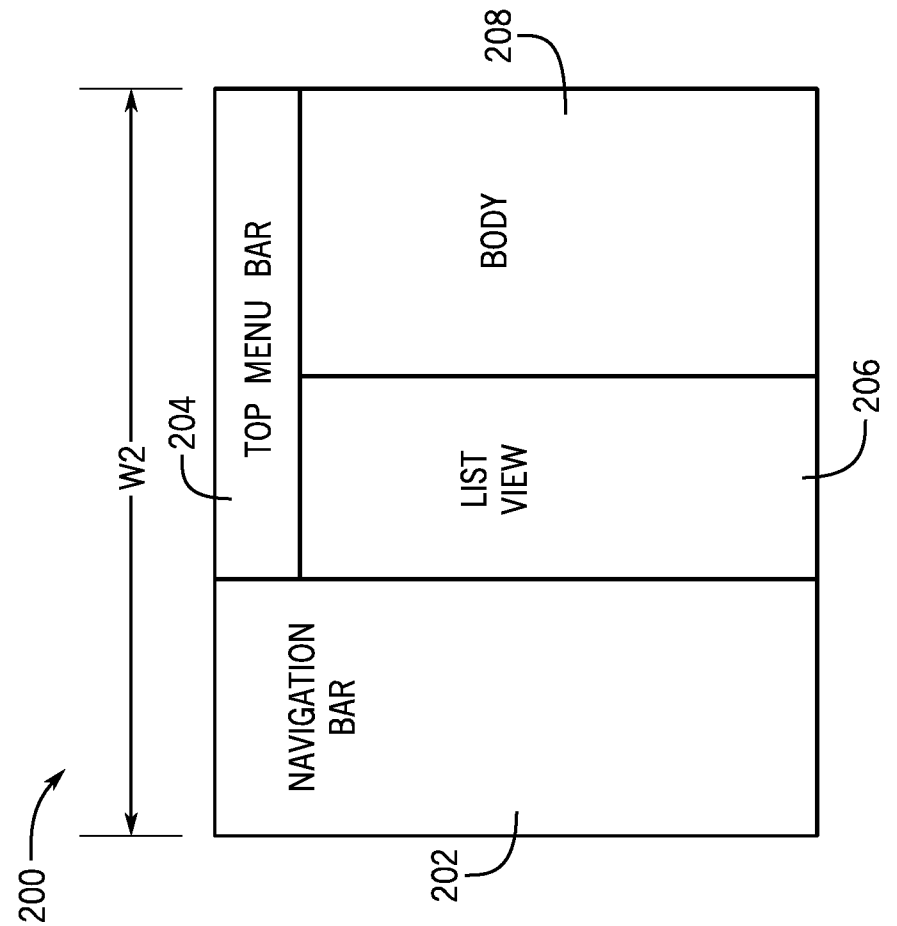

208
TOP MENU BAR
BODY
204
206
W2
LIST VIEW
200
NAVIGATION BAR
202

FIG. 3A

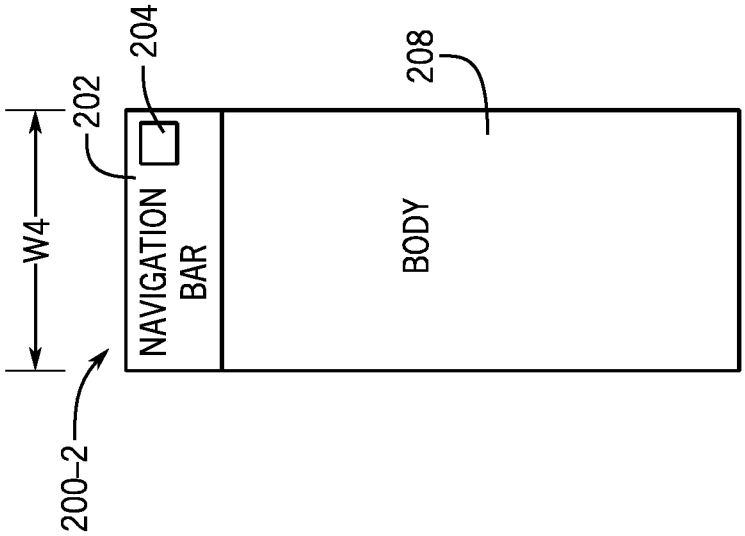

204
208
202
W4
NAVIGATION BAR
BODY
200-2

FIG. 3D

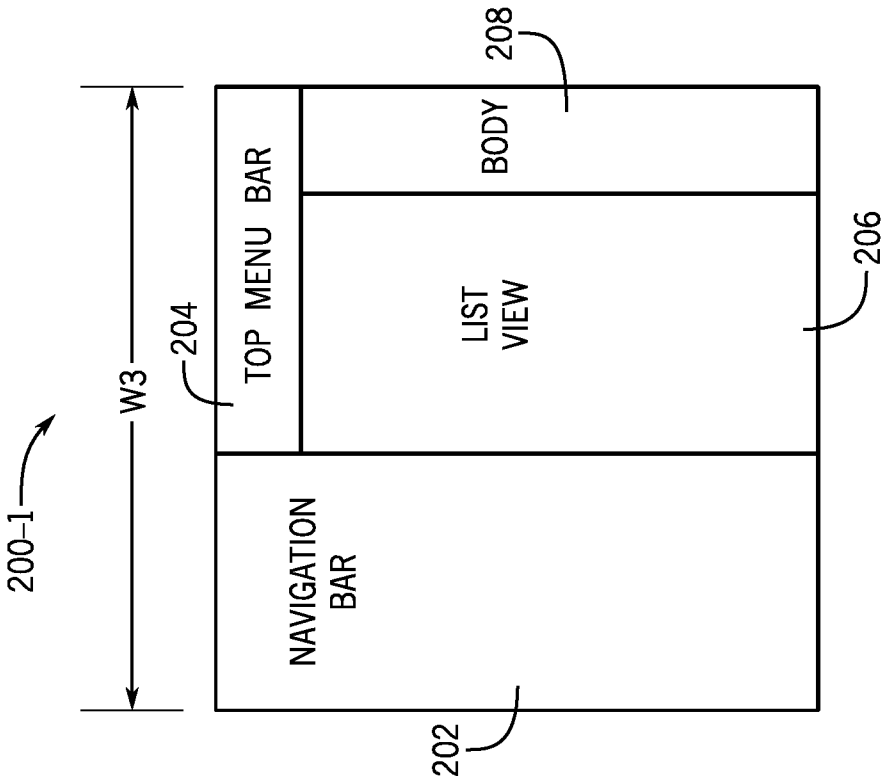

208
BODY
TOP MENU BAR
LIST VIEW
206
204
W3
200-1
NAVIGATION BAR
202

FIG. 3C

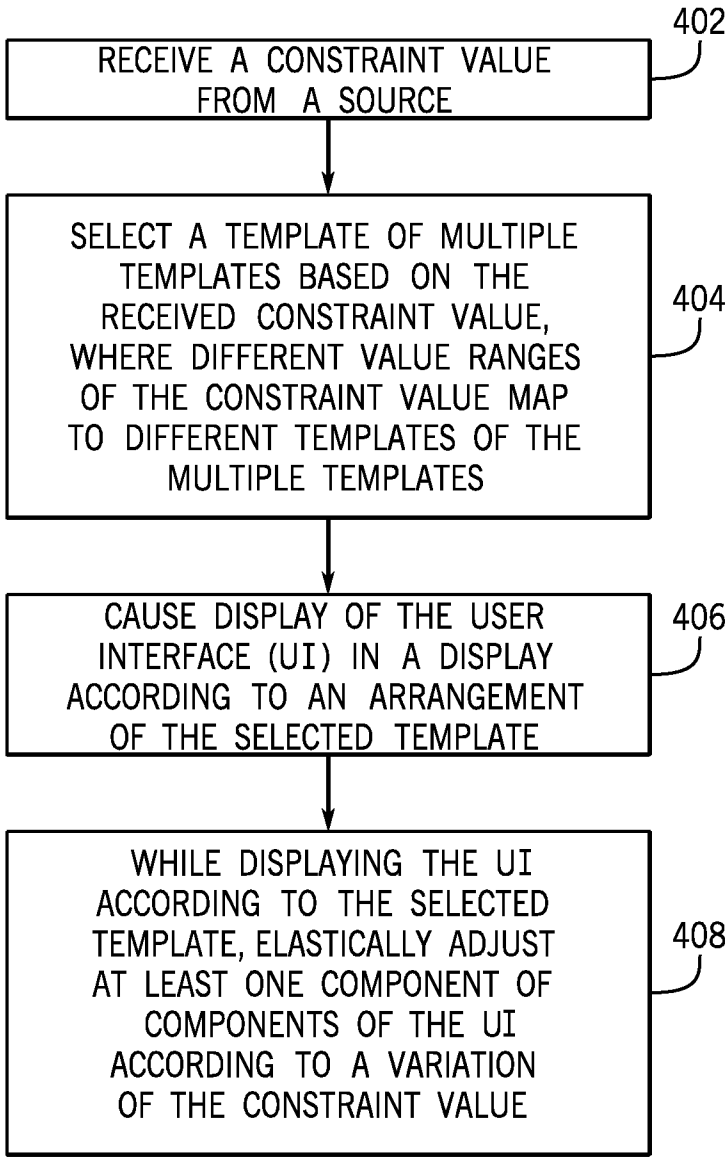

RECEIVE A CONSTRAINT VALUE FROM A SOURCE
402
SELECT A TEMPLATE OF MULTIPLE TEMPLATES BASED ON THE RECEIVED CONSTRAINT VALUE, WHERE DIFFERENT VALUE RANGES OF THE CONSTRAINT VALUE MAP TO DIFFERENT TEMPLATES OF THE MULTIPLE TEMPLATES
404
CAUSE DISPLAY OF THE USER INTERFACE (UI) IN A DISPLAY ACCORDING TO AN ARRANGEMENT OF THE SELECTED TEMPLATE
406
WHILE DISPLAYING THE UI ACCORDING TO THE SELECTED TEMPLATE, ELASTICALLY ADJUST AT LEAST ONE COMPONENT OF COMPONENTS OF THE UI ACCORDING TO A VARIATION OF THE CONSTRAINT VALUE
408

FIG. 4

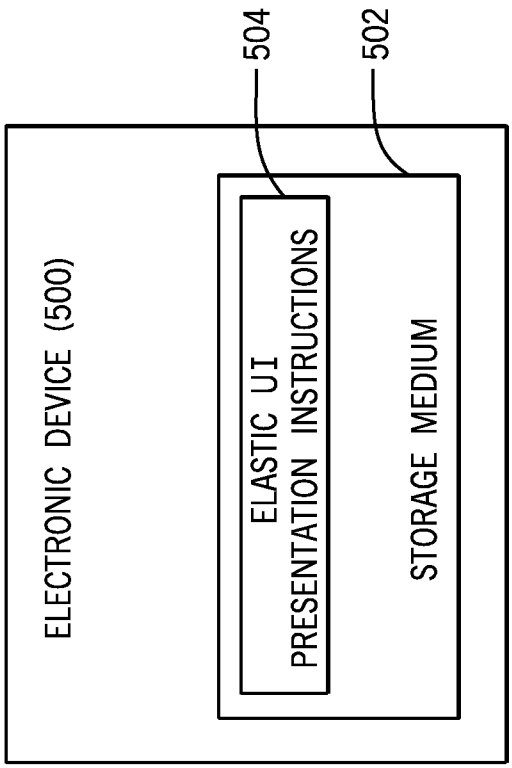

504
502
ELECTRONIC DEVICE (500)
ELASTIC UI
PRESENTATION INSTRUCTIONS
STORAGE MEDIUM

FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2015/057727

A. CLASSIFICATION OF SUBJECT MATTER

G06F 3/048(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F 3/048; G06T 15/60; G06F 3/14; G06F 17/30; G06F 17/21; G06F 3/0481; G06F 3/0484; G06F 3/01

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords:value, variable, user interface, adjust, template

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2013-0185632 A1 (NIRANJAN DAMERA-VENKATA) 18 July 2013 See paragraphs [0019], [0021], [0030]-[0031], [0033], [0035], [0045], [0075]; claim 15; and figure 2.	1-6,9-11,13-15
Y		7-8,12
Y	US 2015-0248191 A1 (APPLE INC.) 03 September 2015 See paragraphs [0047]-[0048]; and figure 4d.	7-8,12
A	US 2013-0212487 A1 (VISA INTERNATIONAL SERVICE ASSOCIATION) 15 August 2013 See paragraph [0073]; and figure 13A.	1-15
A	US 8560941 B2 (STEVEN P. BURNS) 15 October 2013 See column 7, line 66 - column 8, line 25; and figure 2.	1-15
A	US 2014-0365895 A1 (APPLE INC.) 11 December 2014 See paragraph [0200]; and figure 7H.	1-15

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 July 2016 (26.07.2016)	**27 July 2016 (27.07.2016)**

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/US2015/057727

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 2013-0212487 A1	15/08/2013	None	
US 8560941 B2	15/10/2013	US 2010-0262902 A1	14/10/2010
US 2014-0365895 A1	11/12/2014	AU 2014-100585 A4	03/07/2014
		AU 2014-100585 B4	03/07/2014
		CN 104685470 A	03/06/2015
		TW 2015-06759 A	16/02/2015
		US 2014-0365913 A1	11/12/2014
		WO 2014-197340 A1	11/12/2014