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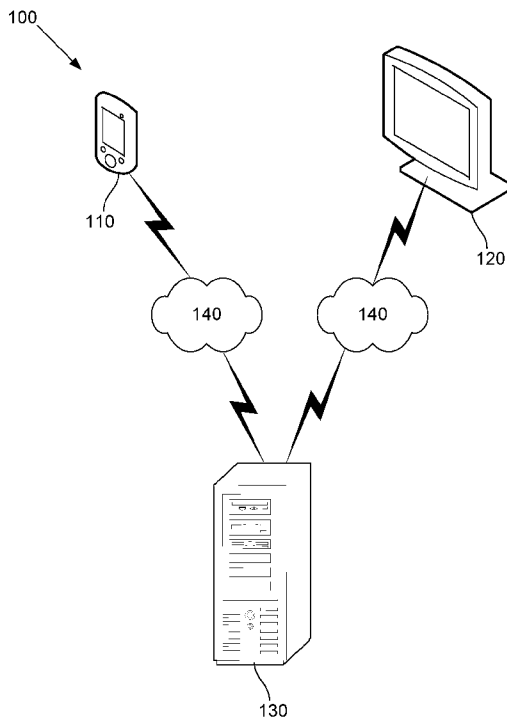


Fig. 1

(57) Abstract: An interactive display system including a display device having a display and at least one display processing device and a coordinating system including at least one coordinating processing device in communication with the display device via a communications network. In use, the coordinating system operates to receive a display request from a client device via a communications network, the display request being indicative of an identity of the display device, cause the client device to display a control interface including one or more input controls, cause the display device to display first content and update the first content in response to one or more input commands provided using the input controls displayed on the client device and record an indication of the displayed first content or user interactions.

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INTERACTIVE DISPLAY SYSTEM

Background of the Invention

[0001] The present invention relates to an interactive display system and method of operating an interactive display system, and in one particular example to an interactive display system for displaying content, such as product information to users.

Description of the Prior Art

[0002] The reference in this specification to any prior publication (or information derived from it), or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that the prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

[0003] It is known to provide electronic displays for advertising purposes. These are often used in a commercial or retail environment to display products or services available for purchase. Whilst the use of electronic displays allows a range of different products to be displayed this is typically performed on the basis of a predefined schedule with the adverts being displayed on a rolling basis. However, as a result of this advertising displayed is not necessarily pertinent to those individuals currently viewing the display.

[0004] Whilst attempts have been made to provide an interactive display, this is typically achieved through the use of touch screen devices, or devices with inbuilt controls. However, touch screen and inbuilt controls add to the cost of the display device and further require that the display device is provided in a location that can be easily reached by customers. This precludes the use of such display devices in a wide range of situations, such as in shopfront windows.

Summary of the Present Invention

[0005] In one broad form the present invention seeks to provide an interactive display system including:

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- a) a display device including:
 - i) a display; and,
 - ii) at least one display processing device; and,
- b) a coordinating system including at least one coordinating processing device in communication with the display device via a communications network, wherein in use, the coordinating system operates to:
 - i) receive a display request from a client device via a communications network, the display request being indicative of an identity of the display device;
 - ii) cause the client device to display a control interface including one or more input controls; and,
 - iii) cause the display device to:
 - (1) display first content; and,
 - (2) update the first content in response to one or more input commands provided using the input controls displayed on the client device;
 - iv) record an indication of at least one of:
 - (1) the displayed first content; and,
 - (2) user interactions.

[0006] Typically the coordinating system provides second content indicative of the displayed first content to the client device, thereby causing the client device to display the second content.

[0007] Typically the coordinating system:

- a) determines first content statistics associated with the display of the first content, the first content statistics including at least one of:
 - i) external reference identifiers related to instances of first content;
 - ii) a display duration associated with each instance of first content;
 - iii) a display time associated with each instance of first content; and,
 - iv) interaction with the first content, the interaction being determined from the input commands; and,

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- b) determines the second content at least partially in accordance with the first content statistics.

[0008] Typically the second content is at least one of:

- a) a summary of the first content;
- b) a browsing history; and,
- c) information relevant to a viewer of the first content.

[0009] Typically the coordinating system:

- a) determines display device statistics for a respective display device over a defined time period; and,
- b) generates a representation of the display device statistics.

[0010] Typically the first content includes information relating to at least one of products, services and subjects.

[0011] Typically the second content includes at least one of:

- a) images of products, the images being sized in accordance with the first content statistics;
- b) a list of at least one of products, services and subjects, prioritised using the first content statistics; and,
- c) links to additional content regarding the at least one of products, services and subjects.

[0012] Typically the coordinating system:

- a) receives an indication of input commands from the client device;
- b) interprets the input commands; and,
- c) determines further actions to be performed in accordance with the input commands.

[0013] Typically the coordinating system:

- a) receives an indication of input commands from the client device; and,

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- b) provides the input commands to the display device thereby allowing the display device to determine actions to be performed in accordance with the input commands.

[0014] Typically the coordinating system causes the display device and client device to communicate so that the client device provides the input commands to the display device thereby allowing the display device to determine actions to be performed in accordance with the input commands.

[0015] Typically the coordinating system:

- a) determines a control interface to be displayed in accordance with the input commands; and,
- b) causes the client device to display the control interface.

[0016] Typically the coordinating system causes the client device to display the control interface by at least one of:

- a) providing control interface data to the client device, thereby causing the client device to display the control interface;
- b) generating a network page including a representation of the control interface, the network page being displayed by the client device; and,
- c) providing an indication of the control interface to the client device, thereby causing the client device to retrieve the control interface data from a data store.

[0017] Typically the coordinating service:

- a) creates a display identifier;
- b) records an association between the display identifier and the display device; and,
- c) provides the display identifier to the display device, the display device being responsive to provide an indication of the display identifier.

[0018] Typically the coordinating service:

- a) determines the display identifier from the display request received from the client device; and,

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- b) uses the display identifier and the association to identify a respective display device on which first content is to be displayed.

[0019] Typically the coordinating system:

- a) determines an indication of second content displayed to a user when using a first client device; and,
- b) provides the indication of the second content to a second client device associated with the user.

[0020] Typically the coordinating system:

- a) provides a transfer identifier to the second client device, the second client device being responsive to display the transfer identifier; and,
- b) receives an indication of the transfer identifier and the indication of the second content from the first client device.

[0021] In one broad form the present invention seeks to provide an interactive display method, the method including, in a coordinating system including at least one coordinating processing device in communication with a display device and a client device via a communications network:

- a) receiving a display request from the client device, the display request being indicative of an identity of the display device;
- b) causing the client device to display a control interface including one or more input controls; and,
- c) causing the display device to:
 - i) display first content; and,
 - ii) update the first content in response to one or more input commands provided using the input controls displayed on the client device;
- d) recording an indication of at least one of:
 - (1) the displayed first content; and,
 - (2) user interactions.

Brief Description of the Drawings

[0022] An example of the present invention will now be described with reference to the accompanying drawings, in which: -

[0023] Figure 1 is a schematic diagram of an example of an interactive display system;

[0024] Figure 2 is a flowchart of an example of the method of operation of the system of Figure 1;

[0025] Figure 3 is a schematic diagram of a second example of an interactive display system;

[0026] Figure 4 is a flowchart of an example of a method for registering a display device with a coordinating system;

[0027] Figures 5A to 5C are a flowchart of an example of a method for displaying content utilising the interactive display system of Figure 3; and,

[0028] Figure 6A to 6C are schematic diagrams of example of client device interfaces.

Detailed Description of the Preferred Embodiments

[0029] An example of an interactive display system will now be described with reference to Figure 1.

[0030] In this example, the system 100 includes a display device 120 and a coordinating system 130, interconnected via one or more communications networks 140. In use, the coordinating system 130 also interacts with a client device 110, which is also connected to the one or more communications networks 140. In this example, two networks 140 are shown to highlight that typically each of the client device 110 and display device 120 typically communicate directly with the coordinating system 130, as opposed to each other, and that this could in part be via different networks. For example, the client device could use the 3G mobile network and Internet, whilst the display device 120 uses a LAN and Internet to communicate with the coordinating system. However, this is not essential and common networks could be used.

[0031] The client device 110 must be capable of communicating via the communications network(s) 140, displaying content to user and receiving user input commands. Whilst the client device 110 may be of any form of suitably configured processing system, it is typically

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a mobile communications device such as a smart phone, tablet, phablet, smart watch, or the like.

[0032] The display device 120 is typically in the form of a display screen, or projector associated projection screen. The display device 120 typically incorporates a display electronic processing device to enable communication via the communications network(s) 140 and to control the display of content on the display.

[0033] The coordinating system 130 is typically in the form of one or more suitably configured processing systems capable of communicating via the communications network(s) 140 to coordinate operation of the client device 110 and display device 120. The coordinating system could therefore be formed from one or more computer servers and in one example is achieved utilising a cloud based implementation.

[0034] Operation of the system of Figure 1 will now be described with reference to Figure 2.

[0035] In this example, at step 200 the coordinating system 130 receives a display request from the client device 110 via the communications network 140, the display request being indicative of an identity of the display device. The display request may be received in any one of a number of appropriate ways, such as via a messaging protocol such as email, SMS, an http request, or the like. The display request could be generated by a software application, such as an app, installed on and executed by the client device, or could be achieved by having the client device navigate to a particular network page, such as a webpage hosted by the coordinating system 130, or the like.

[0036] The identity of the display device 120 could be in any appropriate form and could include a unique alpha-numeric code or the like. The identity could be determined in any suitable manner and could be input manually by the user, or determined automatically, for example by having the client device 110 scan, or otherwise detect, coded data presented visually on the display device, or provided by electronic or network means such as NFC, Bluetooth or iBeacon, as will be described in more detail below.

[0037] At step 210 the coordinating system 130 causes the display device 120 to display first content. In this regard, the term "first content" is used to refer to one or more instances of content that are presented on the display device. The first content typically includes information relating to one or more products, or subject, such as product specifications and/or pricing, vendor information, delivery details, advertising, infomercials, or the like, although whilst particularly advantageous in an advertising context, this is not essential and the content could alternatively be informative and/or instructive. For example, the content could include news or could include information regarding an immediate environment, such as navigational information within a shopping mall, airport, or the like. The content can be in any appropriate form and could include images, text, video and/or audio information, or any combination thereof.

[0038] At step 220 the coordinating system 130 causes the client device 110 to display a control interface including one or more input controls. The control interface is intended to mimic the function of a remote control, providing an easy and intuitive interface for a user to control the content presented on the display device. The client device 110 can be caused to display a control interface in any appropriate manner, such as providing control interface data to the client device, or having this displayed by a preinstalled app or the like.

[0039] The user is then able to provide input commands via the control interface presented on the client device 110 at step 230. This allows the first content to be updated by returning to step 210. This could involve displaying alternative first content, for example to display additional information relating to a product, or subject, or to display information relating to an alternative product or subject. Alternatively, this could involve manipulating the first content, for example to scroll through text, or forward or rewind video or audio content. This process can be repeated, allowing the user to utilise the control interface to navigate through various different instances of first content.

[0040] At step 240 as this process is performed, the coordinating system 130 operates to record at least one of an indication of the first content being displayed and information regarding user interactions. This information can then optionally be used to generate second content, which is provided to the client device 110 for display to the user at step 250. The

term "second content" is used to distinguish from the first content, specifically as the content is presented on the client device 110 as opposed to the display device 120. The second content could be related to the first content, and could include a summary or browsing history indicative of the viewed first content or other information relevant to a viewer of the first content. In the case in which the first content relates to products, this could include a list of products, or the like. However, this is not intended to be limiting, and it will be appreciated that other applications are envisaged. So for example, if the first content is used to identify a shop of interest within a shopping mall, the second content could include an indication of a route to the shop.

[0041] In any event, it will be appreciated that the above described system operates to provide a mechanism by which users can interact with a display device 120 in a public environment, without requiring that the display device 120 is provided with any external input controls. In particular, the user is able to utilise their own client device 110 in order to navigate through content displayed on the display device 120. Furthermore, this is possible even though the client device 110 may not have a direct communication channel to the display device 120. Additionally, second content relating to first content can be made available to the user on their client device 110 after the process of interacting with the display device 120 has been completed thereby avoiding the need for the user to have to write down or memorise information presented to them on the display device.

[0042] Whilst usable in a number of different circumstances, the system finds particular benefit in an advertising context, as this allows users to view information regarding products of interest to them, rather than generic products that may be of no relevance. Furthermore, a summary of those products can be provided to the client device 110, so the user is able to further review the products at a later time.

[0043] A number of further features will now be described.

[0044] In one example, the coordinating system 130 determines first content statistics associated with the display of the first content. The first content statistics can include information such as external reference identifiers related to instances of first content, a

display time or duration associated with a particular instance of first content, or interaction with the first content as determined based on user input commands. The coordinating system 130 can then determine the second content in accordance with the first content statistics. The second content could include a summary of the first content, a browsing history, or the like.

[0045] Thus, in the case of the first content relating to products, the coordinating system 130 can analyse the user's viewing of, and interaction with, particular product information displayed on the display device 120, using this to calculate which products are of more interest to the user. This enables the coordinating system 130 to present the second content in a manner that is meaningful for the user.

[0046] For example, the second content could include presenting images of products with the images sized in accordance with display statistics so images relating to products of greater interest would be presented with a larger size. The display information could also include a list of products prioritised using displayed statistics, so that more popular products are presented higher on the list, or could include lists of additional information regarding the products.

[0047] In addition to this, the coordinating system 130 is able to determine display device statistics for a respective display device 120 over a defined time period, with this reflecting first content displayed to a range of different users, as well as other information, such as content subsequently accessed via the client devices or the like. The coordinating system 130 can then generate a representation of the displayed statistics, providing interested parties with an overview of the content that was of interest to users. This allows advertisers to understand how popular their advertising and/or products are, as well as being able to be used to bill based on interaction with the adverts, for example mimicking a click based charging model. The display device statistics could also be passed to external systems for further analysis, or for example, combined with website analytics tools.

[0048] Interpretation of the input commands provided by the user could be performed in any one of a number of manners, depending on the preferred implementation. For example, the coordinating system 130 could receive an indication of input commands from the client

device, interpret the input commands and then determine further actions to be performed in accordance with the input commands. Thus, in this example, input commands provided by the control interface presented on the client device 110 are sent to the coordinating system 130, allowing the coordinating system 130 to determine what actions are required.

[0049] The coordinating system 130 could alternatively provide the input commands to the display device 120, allowing the display device 120 to determine what actions are required, for example by responding appropriately, for example by determining the product information to be displayed. In this example, the coordinating system 130 simply operates to route received input commands to the display device 120, allowing this to respond as required.

[0050] As a further alternative, the coordinating system 130 can cause the display device 120 and the client device 110 to communicate directly, so that client device 110 provides an indication of the input commands directly to the display device 120, with the display device responding accordingly. It will be appreciated that this could be achieved utilising a local communications protocol such as Wi-Fi, Bluetooth, or the like. In this instance, the coordinating system 130 merely operates to initiate communication between the display device 120 and client device 110.

[0051] However, in general, preference is that user input commands are provided to the coordinating system 130, which passes them through to the display device 120 for interpretation, as this allows a greater degree of control and flexibility over the operation of the system, as will become apparent from the remaining description. Alternatively, the coordinating system 130 may interpret user input commands and effect changes to either or both of the display device 120 or the client device 110.

[0052] The actions taken based on user inputs can vary depending on the preferred implementation irrespective of whether the user inputs are interpreted by the controlling device 130 or the display device 120, and would typically include at least controlling the first content that is displayed, but may also include altering the control interface displayed on the client device. Thus, as users interact with the system, the control interface can be altered

dynamically providing controls that are appropriate to first content being presented on the display device 120.

[0053] In one example, this can be achieved by having the coordinating system 130 determine a control interface to be displayed in accordance with the input commands and then cause the client device 110 to display the control interface. Alternatively, at any time, the display device 120 may notify the coordinating system 130 of appropriate controls to be presented on the client device 110 for the currently presented first content. This could be achieved either by providing control interface data to the client device 110, allowing the client device 110 to generate a representation of a control interface. Alternatively, the coordinating system 130 could generate a network page including a representation of the control interface, with the network page being displayed by the client device 110. As a further alternative, the coordinating system 130 could provide an indication of a control device interface to the client device 110, thereby causing the client device to retrieve the interface from a data store. Thus, for example the client device could store a number of predefined interfaces locally with the coordinating system instructing the client device which interface to display.

[0054] The coordinating system 130 can also determine the first content to be displayed in accordance with the input commands and cause the display device 120 to display the determined first content. Again, this can be achieved by providing first content data to the display device 120, generating a network page including the first content, which is then displayed by the display device 120, or providing an indication of the first content to the display device 120, allowing the display device 120 to retrieve the first content from a local data store. The coordinating system 130 may alternatively notify the display device 120 of user inputs commands in which case the display device determines new or altered first content to be displayed, or other actions to perform. Such actions may include activating or controlling peripherals attached to the display device. In one example this might include operating a camera attached to the display device. In another example this might include activating a mechanised museum display.

[0055] In order for the above described system to operate, each display device typically requires a unique display identifier that can be utilised in order to distinguish between different display devices. Accordingly, the coordinating system typically creates a display identifier, records an association between the display identifier and the display device 120 and provides the display identifier to the display device 120, thereby allowing the display device 120 to provide an indication of the display identifier, for example by displaying a representation of the display identifier, or making it available by electronic, network or other means.

[0056] The identifier can be of any appropriate form and could include an alpha-numeric code displayed visually on the screen and/or could include coded data such as a QR code, barcode, or the like, which can be sensed by the client device 110, manually entered into the client device 110, or in some other way communicated into the client device 110.

[0057] In any event, providing the display identifier to the display device 120 provides a means by which a user's client device 110 can determine the display identifier and incorporate this into the display request, which could be achieved by having the user enter the alpha-numeric code manually, or by scanning coded data presented on the display device 120 using the client device 110. This interaction of communicating the display identifier from the display device to the client device 110 will typically, but not necessarily, occur independently of the communications networks 140. The coordinating service can then determine the display identifier from the display request received from the client device 110 and use the display identifier and the association to identify a respective display device 120 on which content is to be displayed.

[0058] In a further example, the coordinating system can be adapted to determine an indication of second content displayed to a user when using a first client device and provides the indication of the second content to a second client device associated with the user. In this regard, the indication on each client device 110 can be in the form of a cookie, or similar, which allows items of interest to be determined, and the indication on the first device can be effectively migrated to the second device. To achieve this, the coordinating system provides a transfer identifier to the second client device, the second client device being responsive to

display the transfer identifier and receives an indication of the transfer identifier and the indication of second content from the first client device. Thus, an identifier can be displayed on the second client device, which is then entered into the first client device, for example by manual entry, by scanning a visual representation of the transfer identifier, or by electronic or network means. This identifies to the coordinating system that the first and second client devices are associated with the same user, allowing the indication of the second content to be transferred from the first client device to the second client device. This can be used to allow a user to review details of products viewed using the first client device, on the second client device. Alternatively, a similar but reciprocal interaction may be implemented whereby a transfer identifier is provided to and displayed on the first client device, and scanned, entered, or otherwise detected by the second client device, to achieve the same effect.

[0059] A further example system will now be described with reference to Figure 3.

[0060] In this example, one or more client devices 310, display devices 320 and a coordinating system 330, are in communication via one or more communications networks, such as the Internet 341, and/or a number of local area networks (LANs) 342. It will be appreciated that the configuration of the networks 341, 342 are for the purpose of example only, and in practice communication could be via any appropriate mechanism, such as via wired or wireless connections, including, but not limited to mobile networks, private networks, such as an 802.11 networks, the Internet, LANs, WANs, or the like, as well as via direct or point-to-point connections, such as Bluetooth, or the like.

[0061] Each client device 310 is typically a mobile communications device and can therefore include an electronic processing device, such as a microprocessor, a memory, an input/output device, such as a touchscreen, and an external interface such as a radio transceiver, interconnected via a bus. The external interface can be utilised for connecting the client device 310 to the communications networks 341, 342 and multiple interfaces using various communications methods (eg. Ethernet, serial, USB, wireless or the like) may be provided.

[0062] In use, the microprocessor executes instructions in the form of applications software stored in the memory to allow user interaction, display of content and interfaces, and

communication with the coordinating system 330. Accordingly, it will be appreciated that the client device may be formed from any suitable device, such as a smart phone, tablet, smart watch, network enabled media player, laptop, or the like. However, it will also be understood that the client device could include any electronic processing device such as a microprocessor, microchip processor, logic gate configuration, firmware optionally associated with implementing logic such as an FPGA (Field Programmable Gate Array), or any other electronic device, system or arrangement.

[0063] The display devices 320 typically include a display processing system 321 coupled to a display 322. The display processing system typically includes a microprocessor, a memory, an optional input/output device, and an external interface interconnected via a bus. The external interface can be utilised for connecting the display processing system 321 to the communications networks 341, 342 and multiple interfaces using various communications methods (eg. Ethernet, serial, USB, wireless or the like) may be provided.

[0064] In use, the display processing system microprocessor executes instructions in the form of applications software stored in the memory to allow content to be displayed on the display 322. Accordingly, it will be appreciated that the display devices can be formed from any suitable device, and although shown as separate components, the display processing system 321 and display could be integrated into a common housing and in one example could be formed from a smart TV or the like.

[0065] The coordinating system 330 typically includes a processing system coupled to a database. The coordinating system 330 is adapted to be used in coordinating operation of the client devices 310 and display devices 320, providing content for display, and performing other related operations.

[0066] The processing system of the coordinating system 330 typically includes at least one microprocessor, a memory, an optional input/output device, and an external interface, interconnected via a bus. The external interface can be utilised for connecting the processing system to peripheral devices, such as a router for onward connection to the communications networks 341, 342, the databases, other storage devices, or the like. Although a single

external interface is shown, this is for the purpose of example only, and in practice multiple interfaces using various methods (eg. Ethernet, serial, USB, wireless or the like) may be provided.

[0067] In use, the microprocessor executes instructions in the form of applications software stored in the memory to allow the presenting of content to be coordinated, as well as to perform any other required processes, such as communicating with the client and display devices 310, 320. The applications software may include one or more software modules, and may be executed in a suitable execution environment, such as an operating system environment, or the like. Accordingly, it will be appreciated that the processing system may be formed from any suitable processing system, such as a suitably programmed computer system, PC, web server, network server, or the like. However, it will also be understood that the processing system could be any electronic processing device such as a microprocessor, microchip processor, logic gate configuration, firmware optionally associated with implementing logic such as an FPGA (Field Programmable Gate Array), or any other electronic device, system or arrangement.

[0068] Whilst the coordinating system 330 is shown as a single entity, it will also be appreciated that the coordinating system 330 can be distributed over a number of geographically separate locations, for example by using processing systems and/or databases that are provided as part of a cloud based environment. However, the above described arrangement is not essential and other suitable configurations could be used.

[0069] An example of the process for registering a display device 320 with the coordinating system 330 will now be described with reference to Figure 4.

[0070] In this example, at step 400 the display device 320 connects to the coordinating system 330. This is typically achieved either by embedding code in the display device processing system 321 allowing connection to an API of the coordinating system 330, navigating to a network page hosted by the coordinating system 330, or the like, depending on the preferred implementation.

[0071] At step 410, the coordinating system 330, generates an identifier typically using a defined algorithm to ensure this is unique, and associates the identifier with the particular display device 320, for example by recording an association between the identifier and an IP or MAC address of the display device 320, at step 420.

[0072] The coordinating system 330 then provides the identifier to the display device 320, which stores an indication of the identifier, allowing this to be displayed on the display 322, or otherwise made available for communication to a client device 110, at step 440. In this regard, the display device 320 will typically display the identifier at any time during which a user is not interacting with the display device. This will typically occur concurrently with the displaying of generic advertising or the like, depending on the intended use of the display device 320. Alternatively, the display identifier may remain displayed continuously, allowing multiple client devices 110 to interact with the display device 320 simultaneously, or for queueing of client devices, or other handling. It will also be appreciated however, that the identifier could be displayed in other manners, such as through printing on a label, sticker or the like, which is then attached to a housing of the display, or providing this in literature supplied in the vicinity of the display device 320.

[0073] An example of the process for interactive display of content will now be described with reference to Figures 5A to 5C.

[0074] In this example, a user views the display device at step 500 and enters the identifier displayed on the display device 320 into their client device 310 at step 505. In one particular example, this is performed by navigating to a webpage hosted by the coordinating system 330, and then entering a PIN into a relevant field displayed on the webpage, although alternatively this could be achieved in any appropriate way such as scanning a QR code or barcode, or the like. In another implementation the user might scan an NFC tag, or have the identifier accessed via iBeacon or other communication channel. This causes a display request to be created and provided to the coordinating system 330, at step 515. The coordinating system 330 utilises the identifier to identify the relevant display device 320, at step 515.

[0075] At step 520 the coordinating system 330 notifies the display device 320 that first content should be displayed. At step 525, the display device 320 selects the first content to be displayed. This can be achieved in any manner, and could include selecting content randomly, selecting content relating to products currently being displayed, or alternatively selecting a landing page, from which the user can navigate to content of interest. The content is then displayed by having the display device 525 generate a webpage or other visual representation, which is then displayed by the display device 320.

[0076] At step 530, the display device 320 selects a control interface to be displayed by the client device 310, providing an indication of this to the coordinating system 330, allowing the coordinating system to causes this to be displayed by the client device 310, in this example by generating a webpage representing the control interface, which is then displayed on the client device 310, for example by a browser application. An example control interface is shown in Figure 6A. In this example, the control interface 600 displays category, back, forward, product and finish buttons 601, 602, 603, 604, 605, allowing the user to view categories of products, navigate forwards and backwards, view products, or finish.

[0077]

[0078] At step 540 the coordinating system 330 records details of the displayed content in a browsing log.

[0079] At step 545, whilst viewing the first content presented on the display, the user interacts with the remote control interface 600, for example by selecting one of the control inputs buttons 601, 602, 603, 604, 605. Selection of an appropriate input is determined by the coordinating system 330, which forwards this to the display device 320, which interprets the command at step 550 and determines whether further content is to be displayed at step 555. If so, the process returns to step 525 allowing a new control interface and first content to be displayed, as previously described.

[0080] For example, the control interface could be modified as shown in Figure 6B, so that the control interface 610 includes images 611, 612, 613 and text 614 relating to a product

being viewed, and a website button 615, allowing the user to navigate to a website associated with a product.

[0081] Otherwise, at step 560 the server determines first content statistics based on the logged information and generates second content at step 565, allowing this to be displayed on the client device 310 at step 570, for example by generating a suitable webpage. An example of this is shown in Figure 6C, in which the client device displays an interface 620 including images 621, 623, 625 and associated text 622, 624, 626. The images and text relate to specific products viewed by the user, with the products viewed more having larger images and additional text.

[0082] Following this, at step 575, statistics for a given display device can be generated and viewed separately, for example by an advertiser or operator of the system. Alternatively, usage data and statistics may be downloaded, or passed on to another system.

[0083]

[0084] Accordingly, it will be appreciated that the above described system provides an interactive display, that allows users to use their own client device to interact with the display, and view content of interest to them, and in one particular example, advertising content relating to products of interest.

[0085] A number of further specific features will now be described.

[0086] In one example, the system provides a network based service to coordinate activities between various fixed and mobile devices. A third-party service and API is provided to these devices such that they can communicate with each other to provide an end-to-end transfer of control and information.

[0087] The components of the system are intended to be used together to provide the end-to-end solution described in this document, but can be used individually to provide specific but lesser functionality.

[0088] As an example deployment, but not the sole style of deployment:

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1. A shopper is enabled to use their mobile phone as a remote control for a publicly displayed retail display. This allows them to control what is displayed and for the mobile device to act as an input device to the software that controls that display. This can be used to allow self-service access to information, browsing products, purchasing products, or any other user interaction supported by the display.
2. To initiate the use of their mobile device as a remote control, the shopper enters an identifying number, scans a QR code or other distinguishing items on the retail display, or alternately invokes a trigger technology such as NFC (Near Field Communication) tags or Bluetooth Low Energy (BLE) sensors.
3. As the user uses their mobile phone to the remotely control the display, their browsing history is saved and prioritized according to the time they spend viewing each product.
4. A list of “Items of Interest” becomes displayed on their device, during, or after they finish using their device as a remote control. These items are displayed as images such that higher priority items are displayed with larger size.
5. If the user selects one of the images on the “Items of Interest” list, they are given the option to visit a website that provides more information, or that allows the online purchase of the product or related products.
6. The user is also allowed to tag certain items of interest.
7. If the user wishes to view the items of interest on a different device, such as a desktop computer, they can do so by using that device to visit a specific website that displays a QR code or an identifying tag and scan it with their phone. The items of interest list will then become available also on the new device.

[0089] The above example describes the application of this system in a specific environment – a shopper controlling a retail display and subsequent activity – but this system is appropriate for any number of other purposes. This example is provided not to define the sole

role of this system, but to provide an example basis for understanding the further description of the innovation below.

RELATED COMPUTING DEVICES

[0090] This system operates by coordinating information between various displays, mobile devices, websites, desktop computers and tablets. Each of these is a computer that runs software, although some might be servers and others may include an embedded processor. This section describes each of those “computing devices”, each of which executes software that will be involved in the communications described in this document.

“The Coordinating Service” (CS)

[0091] This is the core component of this innovation - a third-party service that runs on a network, available and accessible to each of the other devices related to this innovation. Typically this will be an Internet based service, running on one or more servers “in the cloud”, with known domain names allowing each of the following devices to access the service.

The Display Device (DD)

[0092] This can be any video display used to present information. This might be a retail display in a shopping centre, or a video billboard, a video display in a window, a cinema screen, a regular desktop computer screen, a tablet or an alternate mobile display device or any other video display made visible to one or more people.

[0093] Other than the functionality described in this document, the system does not presuppose what will be displayed on the display device, what it is used for, or who will view it. For the purposes of this innovation, the Display Device is simply a video display that will become interactive when a mobile device is used to control it, and it may display various items of interest to the user.

The Mobile Device (MD)

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[0094] This is a mobile device with a QR code or other appropriate scanner and a browser, or a native application with equivalent functionality, and having access to the network on which the coordinating service is being run, which is typically but not necessarily the Internet.

Further-Information Website (FIW)

[0095] This is any website that might provide information or a service (for example online shopping) related to items displayed on the display device or the mobile device.

Alternate User Device (AUD)

[0096] As the user uses their mobile device to perform remote control of the Display Device, a browsing history is stored by the coordinating service and made visible on the mobile device.

[0097] An *Alternate User Device* is any desktop computer, phone, tablet, point of sale terminal, or other computing device other than the mobile device, to which the user of the mobile device would like to transfer the ability to access that history or other information on the controlling server normally accessed via the mobile device. The Alternate User Device contains a web browser, with access to the coordinating service.

[0098] Each of the above devices are independent and may be owned and operated by different individuals and organisations, but commonly the Display Device (DD) and the Further Information Website (FIW) will be operated by related parties.

[0099] A typical objective using this system might be to direct users of a Display Device to a related Further Information Website. For example, a retail display in a store might via this invention guide users of the display to the store's ecommerce site.

[0100] The Mobile Device and Alternate User Device (AUD) will usually also be related by owner or access, such that the user of the mobile device is also the user of the alternate user device.

SPECIFIC CONCEPTS

[0101] A number of specific concepts implemented by the system will now be described.

[0102] In one example, the system provides a third party service to enable remote control of a network connected display by a mobile device.

[0103] This allows the user of a mobile device to scan a display and then interact with the display using the mobile device as a remote control. The novel aspect is the use of a third party service to coordinate and broker communications between multiple displays and multiple mobile devices.

Idle Mode:

1. A display device registers with the coordinating service (CS) to indicate that it is available for being controlled by a remote device. A unique identifier identifies each display device.
2. The coordinating service (CS) records details of the display device and returns a QR Code, or other identifier, which the display device will make available for scanning by a mobile device containing a QR code scanner, NFC, Low Power Bluetooth or other type of scanner/reader. This identifier contains a URL that will be used by the mobile device (MD) to contact the coordinating service over the network. The URL also contains a unique identifier that identifies the specific display device, and optionally a randomizing component to prevent URLs being reused at a later time.
3. A person wishing to control the display device scans the QR code or identifier from the display device (DD), using their mobile device (MD). The scanned code is used to access the unique webpage from the coordinating service (CS) in a browser on the mobile device. The scanner and the browser may be separate applications, or may be combined within a single application.
4. The web page returned by the coordinating service (CS) provides the appearance and functionality of a remote control.

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5. At the same time, the coordinating service (CS) communicates with the display device (DD) to notify it that a user is ready to control its display. At this time, the coordinating service considers the display device and the mobile device (MD) to be “paired”. Usually this pairing is one-to-one, with a single mobile device being used to control a display device, however this innovation also provides for the pairing of multiple mobile devices with a single display device, or a single mobile device with multiple display devices.
6. At this point the display is considered to have entered “active mode”.

Active Mode:

1. When the display device (DD) receives notification that a user’s mobile device (MD) is paired and ready to control its display, it will typically, but not necessarily, change its appearance to indicate pairing of the display device and the mobile device. As it registers during idle mode, or as it changes its display, or at any other time, the display device can notify the coordinating service (CS) of relevant controls for the remote control.
2. At appropriate times - upon initial connection, when requested by the mobile device (MD), when a notification of controls being changed comes from the display device (DD), periodically, or at other times - details of the remote controls to be displayed will be passed from the display device to the coordinating service (CS), which then passes the details along to any paired mobile device. The mobile device will then change its user interface to provide the new controls.
3. As the user utilizes the controls on the remote control display on their mobile device (MD), the mobile device notifies the coordinating service (CS) of the activation of the controls. This may include buttons being pressed, text being entered, and other user interface events. The coordinating service passes this information through to the paired display device(s) (DD).

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4. The display device (DD) may respond to remote control events in any way it chooses, but commonly will change what it displays, and may result in the need to notify the controlling service (CS) of a new set of controls, which will again be passed through to paired mobile devices (MD).

[0104] The mobile device based pairing functionality described above might be alternately embedded in a single mobile software application running on the mobile device, which may de-engineer the URL for the remote control webpage and use information contained within it allow API access to the coordinating service, and hence provide functionality that parallels the described browser based approach.

[0105] In one example, the system provides a third party service to prioritize items of interest based upon viewing time, and visual representation of that priority using varying image sizes.

1. Each time the display device (DD) notifies the coordinating service (CS) of new remote controls available to the user, it is also able to specify that a specific “item” is being displayed. This involves passing information about the item – a unique identifier, description, an image URL, and other information – to the coordinating service. Also included is a URL for “more information” about the item. The item information is remembered within the coordinating service as the “current item”.
2. As the mobile device (MD) is used to control the display device (DD) (via the coordinating service) to view different items, the current item in the coordinating service (CS) changes, and the coordinating service keeps a list of how much time is spent on each individual item. This is called the “Items of Interest” list.
3. The coordinating service (CS) prioritizes the Items of Interest list such that items that are the “current item” for longer time periods are given a high priority, and items that are current for shorter time are given a low priority. For the purposes of prioritization cumulative times are used, in addition to how many times each item becomes current.

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4. The coordinating service (CS) can also get explicit “tag” requests from the mobile device (MD) indicating that the user has visually seen something of interest that they wish to tag for later.
5. A visual display of the items of interest is provided by the coordinating service (CS) to the user’s mobile device (MD). In this visual representation items with a higher priority are represented by large image sizes, and items with lower priority are displayed with smaller image sizes. This allows the user to immediately identify on the mobile device items that they spent more time viewing on the display device.
6. If the user clicks on an item in the Items of Interest list, the “more information” URL is opened in their browser and will display a web page from a Further Information Website (FIW). This is usually a website containing information about the item, or an ecommerce website.
7. An API is also provided by the coordinating service (CS) to provide access to the Items of Interest list by applications running on the mobile device (MD) or elsewhere.

[0106] In one example, the system provides a method by which a web server may allow a mobile device to copy a web cookie to another network connected device.

[0107] Using this system as described so far, multiple mobile devices may be used to remotely control a display device, although not usually simultaneously. Similarly a single mobile device may be used to access multiple display devices, although not usually simultaneously. Each mobile device will have its own Items of Interest List maintained by the coordinating service, which can be identified by a unique ID. To remember the Items or Interest relevant for a specific browser, an HTML cookie is stored in the browser of the mobile device. Each time the device is used to access the Interest List the cookie is used by the coordinating service to determine which Interest List should be displayed.

[0108] If the user wishes to view the Items of Interest List on their mobile device (MD) with a browser on an Alternate User Device (AUD), for example on a tablet or desktop machine, they need to authorize the new browser to access their Items of Interest List. The following process allows this to happen, by passing a copy of the cookie from the mobile device (MD) to the Alternate User Device (AUD):

1. Using the browser of an Alternate User Device (AUD), the user visits a web page on the web server of the coordinating service (CS) that provides this service.
2. This web page displays a QR code or other visual identification containing a URL referring back to the coordinating service (CS). Each time this page is displayed the URL will be different.
3. The user wishing to transfer their Items of Interest list scans the visual identification on the display of the Alternate User Device (AUD) using their mobile device (MD). The scanned URL is opened in the browser of their mobile device - the same browser used to control the display device that generated the Interest List, and hence containing the cookie used to access the Items of Interest list.
4. The web page that is opened in the mobile device (MD) browser is a page provided by the coordinating service (CS). The request to fetch that page from the web server of the coordinating service contains (a) A URL that uniquely identifies the Alternate User Device (AUD), and (b) the cookie normally used by the browser on the mobile device when it requests the Items of Interest list. From these two pieces of information the coordinating service can determine which Interest List and which Alternate User Device should be paired to allow access.
5. The coordinating service passes a message to the web page still running on the Alternate User Device (AUD), telling it to set a cookie with the value required to access the Items of Interest List.

6. From that point onwards the Alternate User Device (AUD) can be used to access the same Interest List as the mobile device.

IMPLEMENTATION

[0109] One possible implementation of this service is as follows:

1. The coordinating service is a website written in NodeJs or other suitable language, with the following parts:
 - i) Communication endpoints to receive connections from display devices, mobile devices, alternate user devices, and other computing devices on the same network.
 - ii) Use of a protocol that allows full-duplex communications, using web sockets, or a web socket-like virtualization layer.
 - iii) A standard HTTP web server to serve up web pages as described in this document.
 - iv) A RESTful API to allow programmatic access to the coordinating service.
2. A client-side (runs in the browser) script written in the Javascript language that provides an API for use within a browser-based application code running on the display device (DD). This API allows registration of the device with the coordinating service (CS), notification of controls and other information TO the coordinating service, receipt of events FROM the coordinating service and other functionality. This script can be linked into a web page from the coordinating service's web server, from a content delivery network (CDN), or be preloaded on the display device.
3. The mobile device is a typical consumer mobile smartphone or tablet that supports a QR code or other type scanner, bridging to a browser that has access to the network of the coordinating service and supporting the virtualized web socket protocols. Examples include Apple iOS, Android, Windows Mobile and Blackberry operating systems.

4. Display Devices can be any device or combination of devices running - but not restricted to – a browser capable of using the virtualized web sockets implementation described above, executing the client-side Javascript script, and having a display viewable to a user. In most cases this will be any display device with network access and a browser supporting HTML5. Display devices can also be any native application residing on a smartphone or tablet capable of communication over the virtualized web sockets interface. Typical hardware for display devices might include a PC with a display attached, a retail display with an embedded PC, a “Smart-TV” dongle, or a tablet with a large screen.
5. The Alternate User Device will be a computing device with an HTML5 capable browser or a native application. The pages it displays utilize the Javascript library provided by the coordinating service, and the web socket or virtualized web socket library and it’s protocols.

[0110] Each of these devices is networked together via the public Internet, however the specifics of their individual connections to the Internet are not relevant to this innovation.

[0111] Throughout this specification and claims which follow, unless the context requires otherwise, the word “comprise”, and variations such as “comprises” or “comprising”, will be understood to imply the inclusion of a stated integer or group of integers or steps but not the exclusion of any other integer or group of integers.

[0112] Persons skilled in the art will appreciate that numerous variations and modifications will become apparent. All such variations and modifications which become apparent to persons skilled in the art, should be considered to fall within the spirit and scope that the invention broadly appearing before described.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

- 1) An interactive display system including:
 - a) a display device including:
 - i) a display; and,
 - ii) at least one display processing device; and,
 - b) a coordinating system including at least one coordinating processing device in communication with the display device via a communications network, wherein in use, the coordinating system operates to:
 - i) receive a display request from a client device via a communications network, the display request being indicative of an identity of the display device;
 - ii) cause the client device to display a control interface including one or more input controls; and,
 - iii) cause the display device to:
 - (1) display first content; and,
 - (2) update the first content in response to one or more input commands provided using the input controls displayed on the client device;
 - iv) record an indication of at least one of:
 - (1) the displayed first content; and,
 - (2) user interactions.
- 2) An interactive display system according to claim 1, wherein the coordinating system provides second content indicative of the displayed first content to the client device, thereby causing the client device to display the second content.
- 3) An interactive display system according to claim 1 or claim 2, wherein the coordinating system:
 - a) determines first content statistics associated with the display of the first content, the first content statistics including at least one of:
 - i) external reference identifiers related to instances of first content;
 - ii) a display duration associated with each instance of first content;
 - iii) a display time associated with each instance of first content; and,
 - iv) interaction with the first content, the interaction being determined from the input commands; and,

- b) determines the second content at least partially in accordance with the first content statistics.
- 4) An interactive display system according to claim 3, wherein the second content is at least one of:
 - a) a summary of the first content;
 - b) a browsing history; and,
 - c) information relevant to a viewer of the first content.
 - 5) An interactive display system according to claim 3 or claim 4, wherein the coordinating system:
 - a) determines display device statistics for a respective display device over a defined time period; and,
 - b) generates a representation of the display device statistics.
 - 6) An interactive display system according to any one of the claims 1 to 5, wherein the first content includes information relating to at least one of products, services and subjects.
 - 7) An interactive display system according claim 6, wherein the second content includes at least one of:
 - a) images of products, the images being sized in accordance with the first content statistics;
 - b) a list of at least one of products, services and subjects, prioritised using the first content statistics; and,
 - c) links to additional content regarding the at least one of products, services and subjects.
 - 8) An interactive display system according to any one of the claims 1 to 7, wherein the coordinating system:
 - a) receives an indication of input commands from the client device;
 - b) interprets the input commands; and,
 - c) determines further actions to be performed in accordance with the input commands.
 - 9) An interactive display system according to any one of the claims 1 to 7, wherein the coordinating system:
 - a) receives an indication of input commands from the client device; and,

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- b) provides the input commands to the display device thereby allowing the display device to determine actions to be performed in accordance with the input commands.
- 10) An interactive display system according to any one of the claims 1 to 7, wherein the coordinating system causes the display device and client device to communicate so that the client device provides the input commands to the display device thereby allowing the display device to determine actions to be performed in accordance with the input commands.
- 11) An interactive display system according to any one of the claims 1 to 10, wherein the coordinating system:
- a) determines a control interface to be displayed in accordance with the input commands; and,
 - b) causes the client device to display the control interface.
- 12) An interactive display system according to claim 11, wherein the coordinating system causes the client device to display the control interface by at least one of:
- a) providing control interface data to the client device, thereby causing the client device to display the control interface;
 - b) generating a network page including a representation of the control interface, the network page being displayed by the client device; and,
 - c) providing an indication of the control interface to the client device, thereby causing the client device to retrieve the control interface data from a data store.
- 13) An interactive display system according to any one of the claims 1 to 12, wherein the coordinating service:
- a) creates a display identifier;
 - b) records an association between the display identifier and the display device; and,
 - c) provides the display identifier to the display device, the display device being responsive to provide an indication of the display identifier.
- 14) An interactive display system according to claim 13, wherein the coordinating service:
- a) determines the display identifier from the display request received from the client device; and,
 - b) uses the display identifier and the association to identify a respective display device on which first content is to be displayed.

- 15) An interactive display system according to any one of the claims 1 to 14, wherein the coordinating system:
- a) determines an indication of second content displayed to a user when using a first client device; and,
 - b) provides the indication of the second content to a second client device associated with the user.
- 16) An interactive display system according to claim 16, wherein the coordinating system:
- a) provides a transfer identifier to the second client device, the second client device being responsive to display the transfer identifier; and,
 - b) receives an indication of the transfer identifier and the indication of the second content from the first client device.
- 17) An interactive display method, the method including, in a coordinating system including at least one coordinating processing device in communication with a display device and a client device via a communications network:
- a) receiving a display request from the client device, the display request being indicative of an identity of the display device;
 - b) causing the client device to display a control interface including one or more input controls; and,
 - c) causing the display device to:
 - i) display first content; and,
 - ii) update the first content in response to one or more input commands provided using the input controls displayed on the client device;
 - d) recording an indication of at least one of:
 - (1) the displayed first content; and,
 - (2) user interactions.

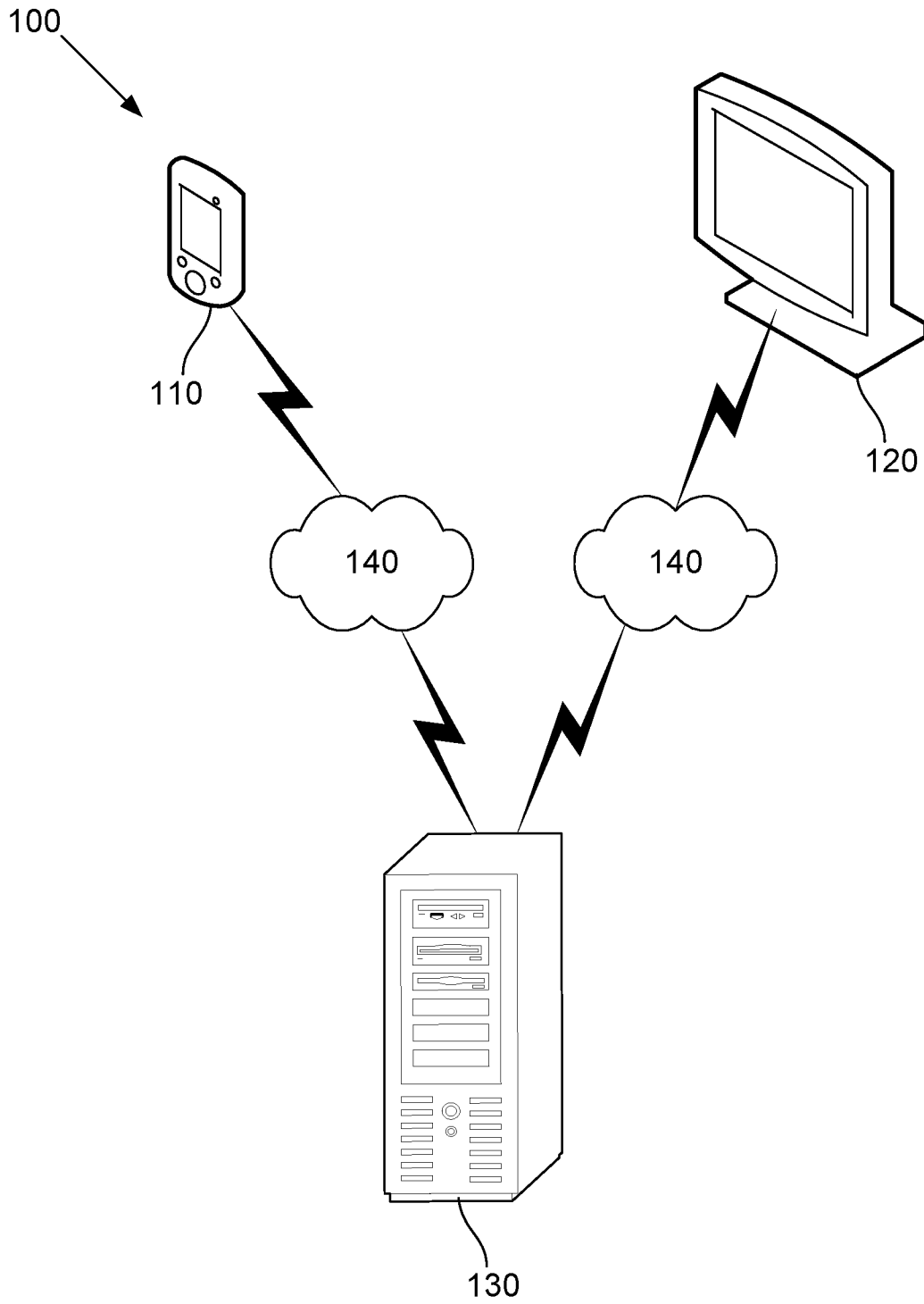


Fig. 1

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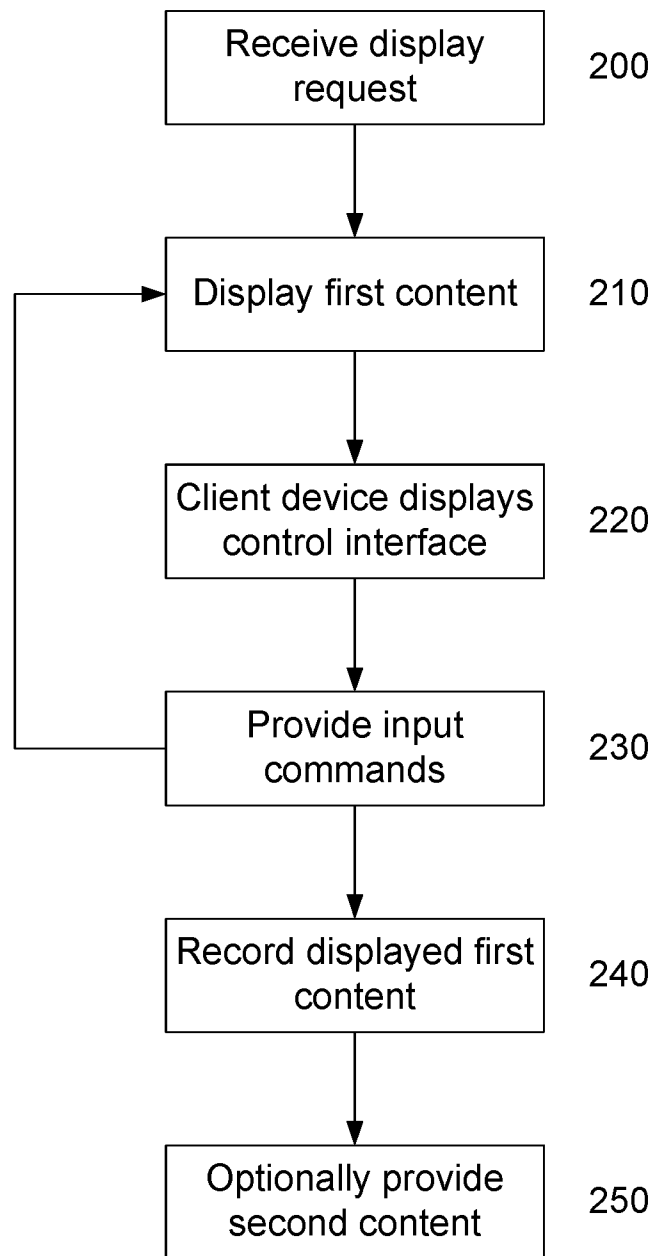


Fig. 2

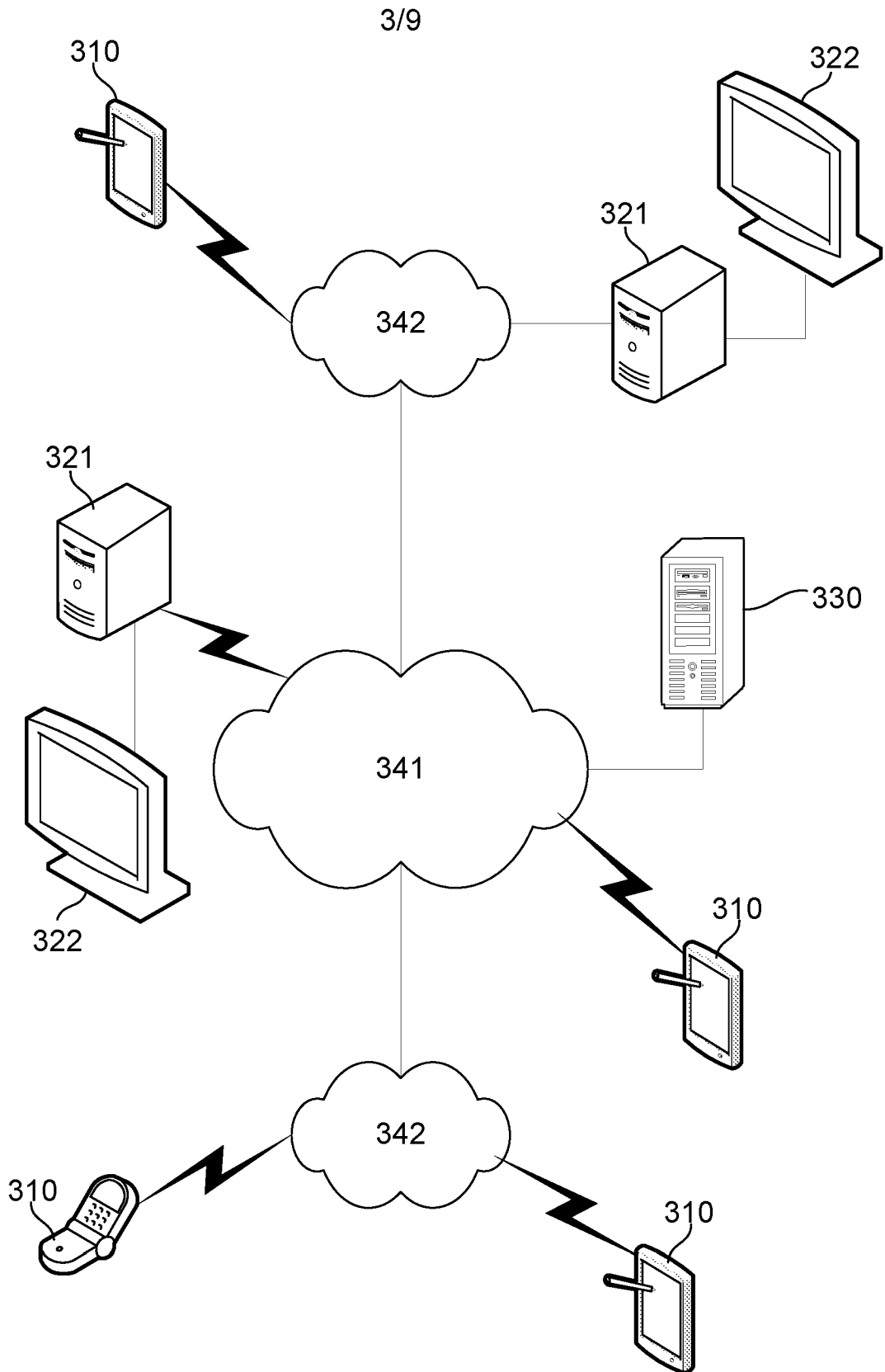


Fig. 3

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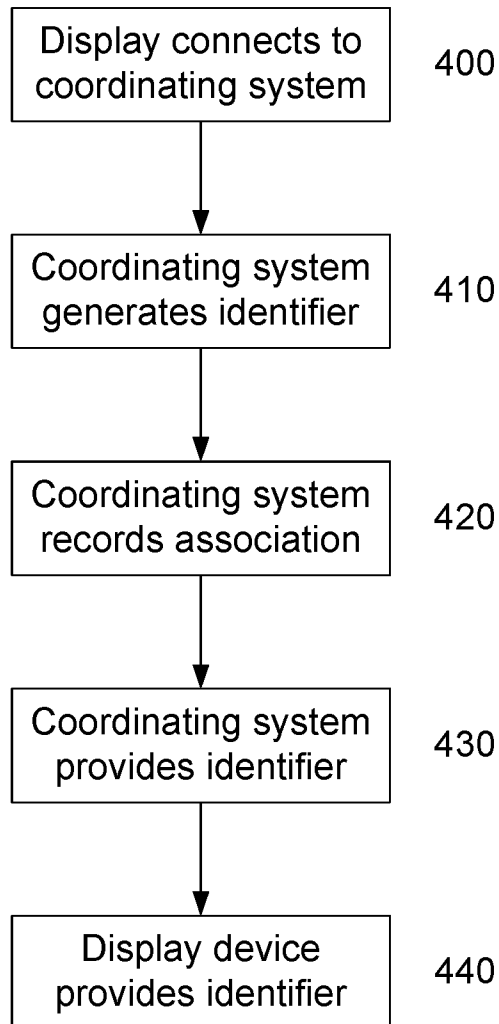


Fig. 4

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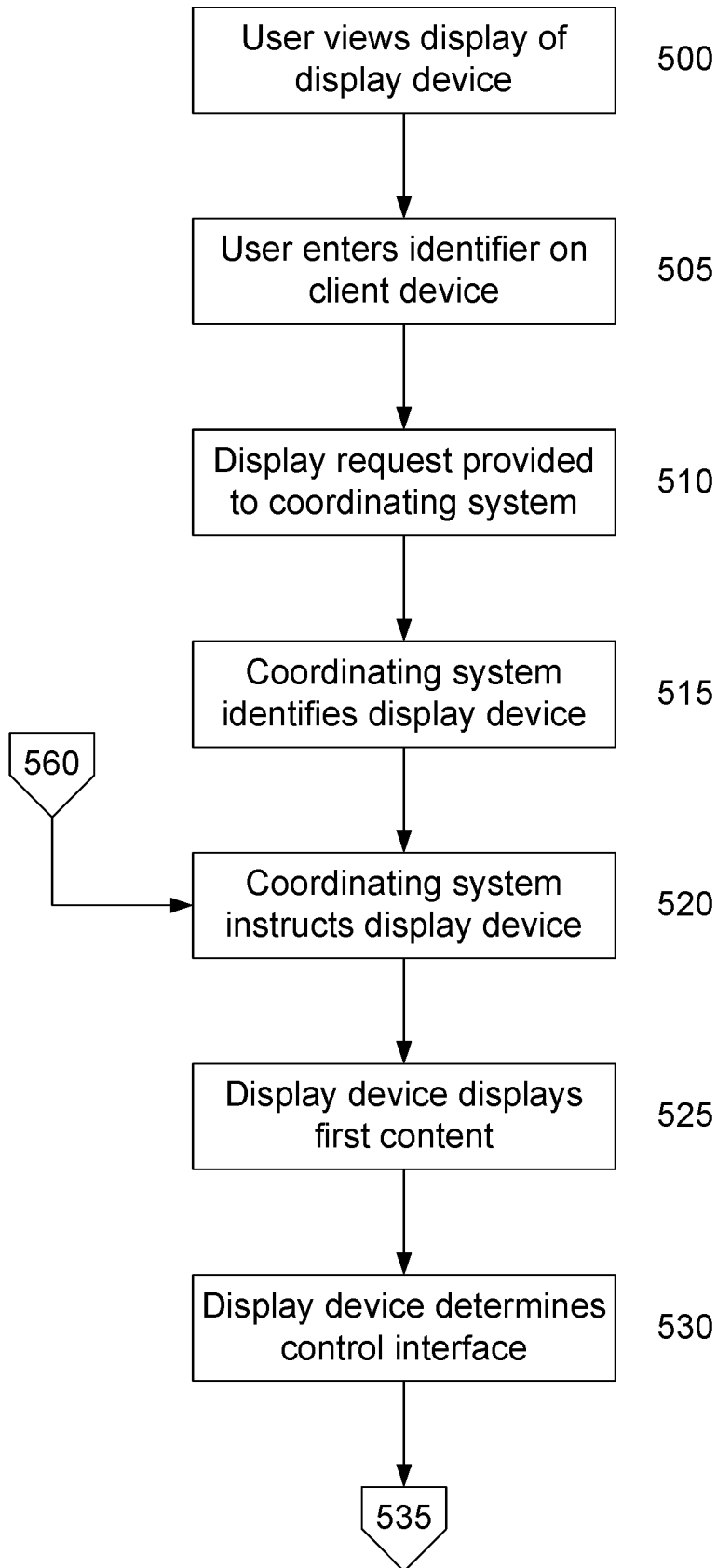


Fig. 5A

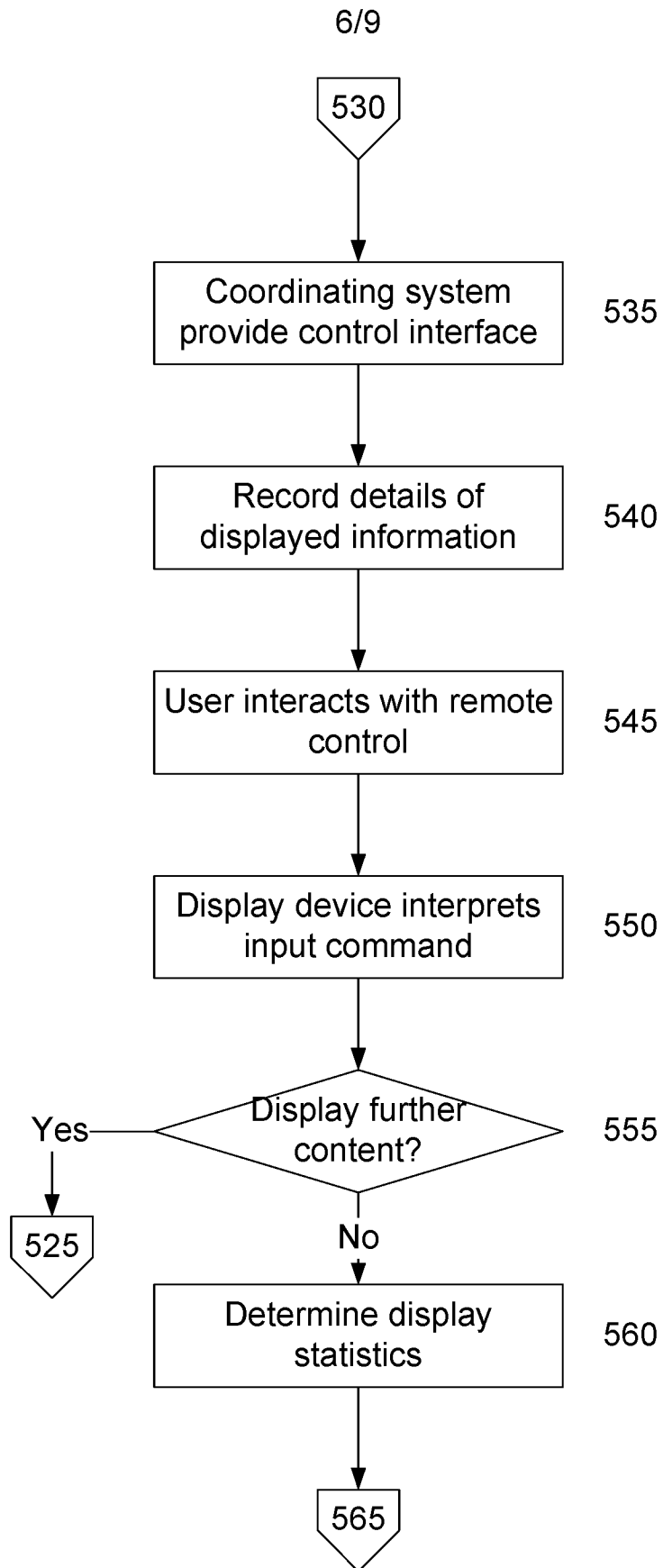


Fig. 5B

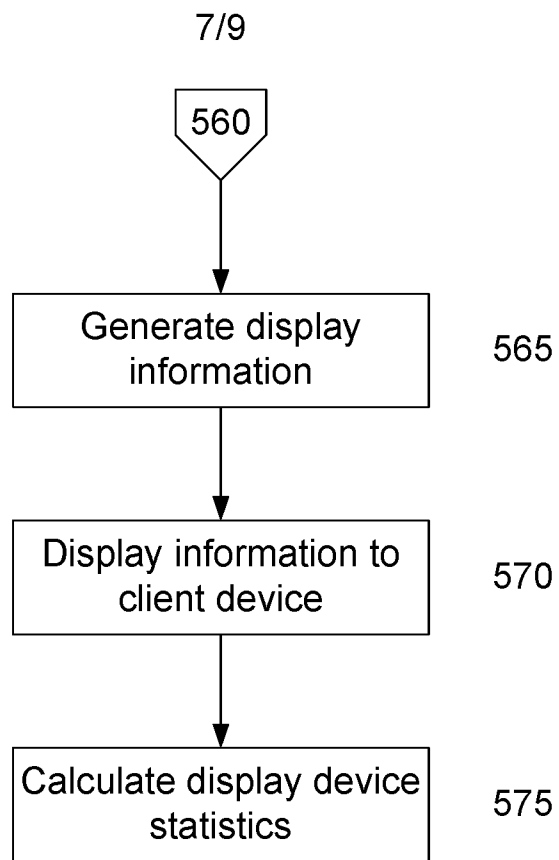


Fig. 5C

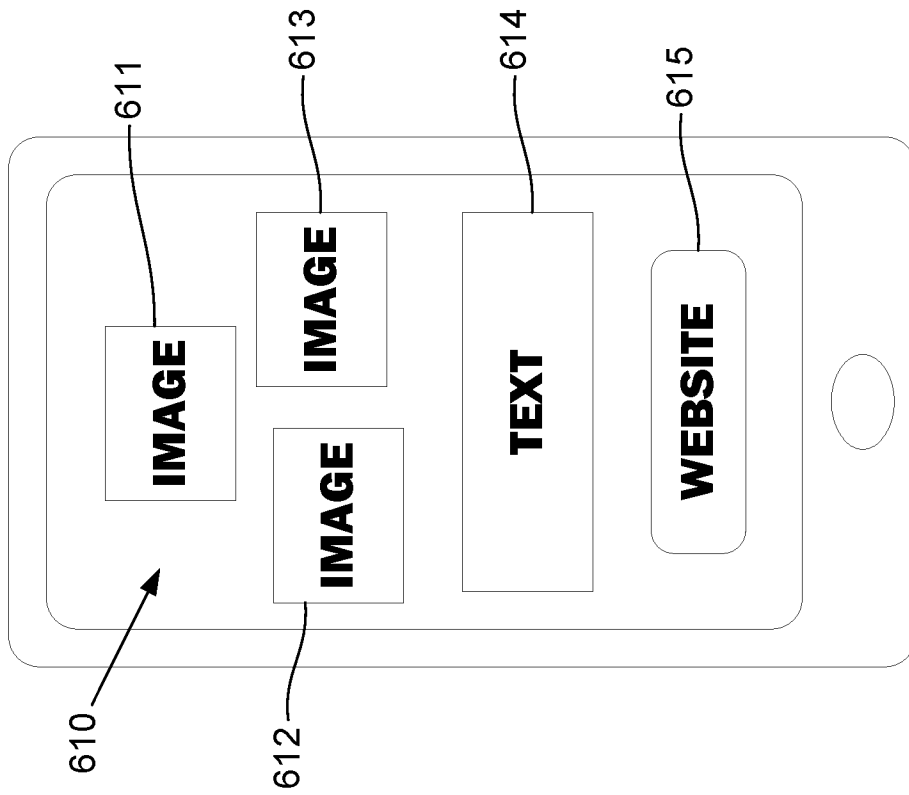


Fig. 6A

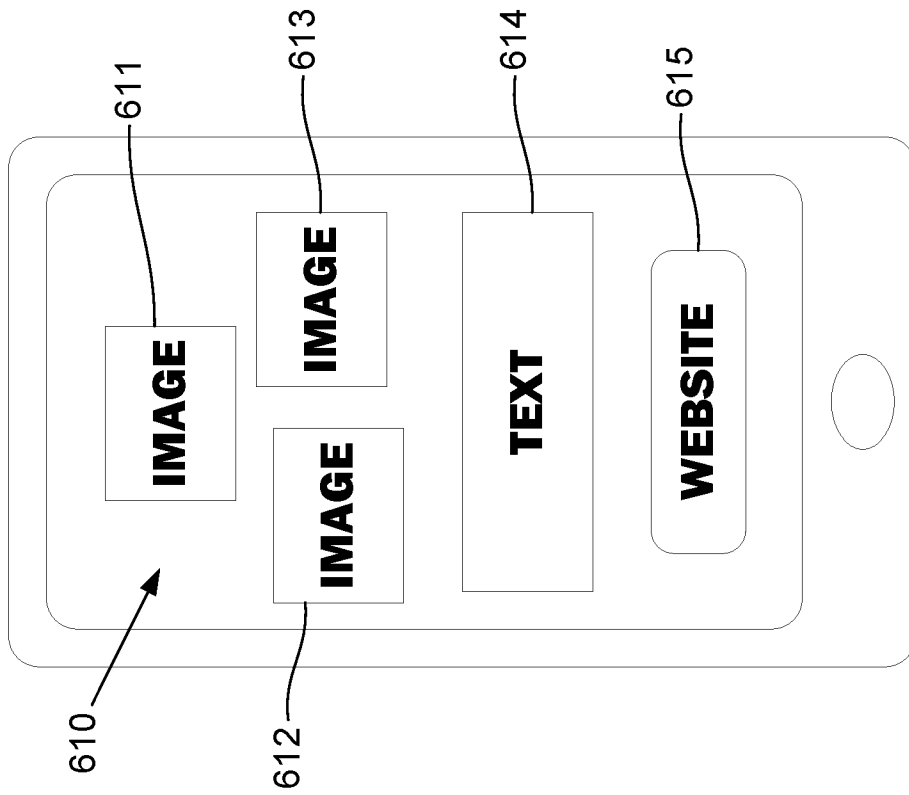


Fig. 6B

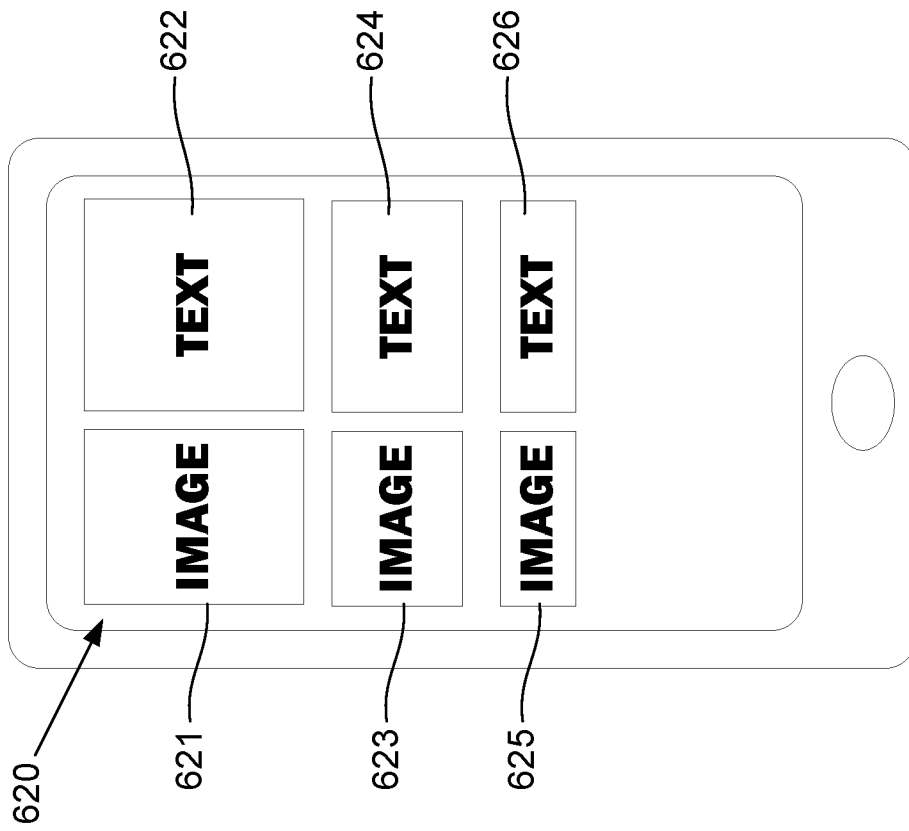


Fig. 6C

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU2015/050211

A. CLASSIFICATION OF SUBJECT MATTER

G09G 5/00 (2006.01) G06F 13/14 (2006.01) G06F 3/01 (2006.01)

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)

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Searched databases EPODOC, WPI using keywords: display, interact, interface, remote, client, network, record and other similar terms.

Searched Google Patents using keywords: connect, smartphone, storefront, advertisement, display, app, interact, record, data, history, marketing and other similar terms.

Applicant(s)/Inventor(s) name searched in Google Patents and in internal databases provided by IPAustralia.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Documents are listed in the continuation of Box C		

 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	"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	
"E" earlier application or patent but published on or after the international filing date	"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	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"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	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 13 July 2015	Date of mailing of the international search report 13 July 2015
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Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA Email address: pct@ipaustralia.gov.au	Authorised officer Shuchin Taher AUSTRALIAN PATENT OFFICE (ISO 9001 Quality Certified Service) Telephone No. 0262832862
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INTERNATIONAL SEARCH REPORT C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		International application No. PCT/AU2015/050211
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2014/036568 A1 (GAME CONCOURSE, INC.) 06 March 2014 See the whole document, in particular, the abstract, fig. 1, 5, 6B, 6C, 6D, para. 0038 and 0046-0047.	1-17
X	US 2012/0084812 A1 (THOMPSON et al.) 05 April 2012 See the whole document, in particular, the abstract, fig. 1, para. 0031-0033 and 0049-0051.	1-17

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2015/050211

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
WO 2014/036568 A1	06 March 2014	US 2014333508 A1	13 Nov 2014
		US 2014333509 A1	13 Nov 2014
US 2012/0084812 A1	05 April 2012	US 2012084807 A1	05 Apr 2012
		US 2012084810 A1	05 Apr 2012
		US 2012084811 A1	05 Apr 2012

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

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