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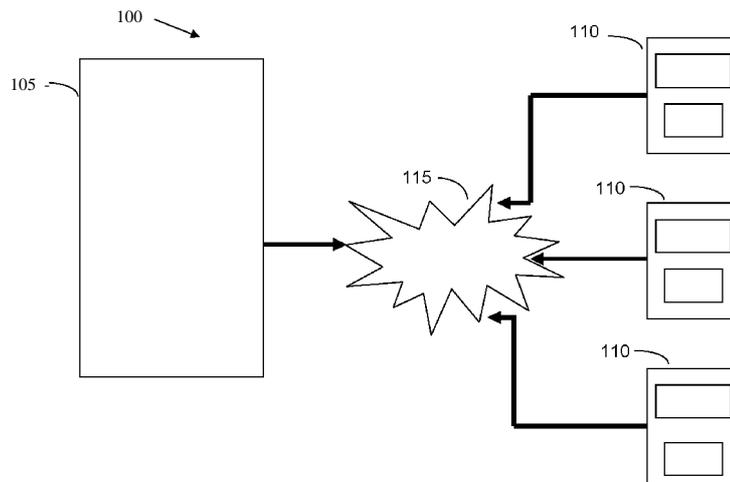
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(54) **Title:** A METHOD OF DEPLOYING A CONTEXTUALLY DEPENDENT APPLICATION

Fig. 1



(57) **Abstract:** A method of deploying a contextually dependent application on a mobile device, the method comprising the steps of: determining a current location of the mobile devices; gathering environmental data from the mobile device; inferring from the mobile device's current location and the gathered environmental data an operating environment of the mobile device; receiving a list of applications, wherein the list comprises metadata for each of the applications; analysing the metadata to identify an application that comprises characteristics that are compatible with the operating environment of the mobile device; and installing the identified application on the mobile device.

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A METHOD OF DEPLOYING A CONTEXTUALLY DEPENDENT APPLICATION

Field of the invention

5 The invention is in the field of location based services. In particular, the present invention provides a method and an apparatus for contextual application deployment for mobile devices.

Background of the invention

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Currently, mobile devices use a model of application deployment by which the user locates applications for use on a mobile device by actively having to search for each application. For example, this is typically achieved by accessing an application store and manually searching for an application of interest.

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Although this model is suitable for some types of applications, which are not, for example, location specific or time dependent, for example games, music etc., this type of deployment model does not work for applications that are location specific or time dependent. These types of applications are termed situational applications. Examples of situational applications are applications for ordering food from a seat at a local restaurant or cafe or informing one what type of activities are available when one enters a theme park.

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There are many problems encountered when trying to use a traditional application deployment model for situational applications. These problems range from a user not knowing that an application which is relevant to their situation exists, or the user may know about the application but must be able to use it within a certain time period.

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Hence, there is a need in the art to provide an improved means in which situational applications can be effectively deployed onto a mobile device. Published article 'Nokia Technology Insights series', Nokia Research Center (NRC) January 2009 discloses using context rich information in order to use as a search filter to make more informed decisions

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about what information to send to a subscribing party. However, this disclosure does not address the problem of how to deploy contextually sensitive applications.

Summary of the invention

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Viewed from a first aspect the present invention provides a method of deploying a contextually dependent application on a mobile device, the method comprising the steps of: determining a current location of the mobile devices; gathering environmental data from the mobile device; inferring from the mobile device's current location and the gathered
10 environmental data an operating environment of the mobile device; receiving a list of applications, wherein the list comprises metadata for each of the applications; analysing the metadata to identify an application that comprises characteristics that are compatible with the operating environment of the mobile device; and installing the identified application on the mobile device.

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Preferably, the present invention provides a method further comprises determining that the application's characteristics are no longer compatible within the mobile device's operating environment and uninstalling the application from the mobile device.

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Preferably, the present invention provides a method wherein an application comprises a predetermined geographical radius and further comprises the step of: determining whether the mobile device is outside of the geographical radius and if so uninstalling the application.

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Preferably, the present invention provides a method wherein the environmental data is gathered from sensors operable on the mobile device.

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Preferably, the present invention provides a method further comprising: responsive to detecting a new location of the mobile device, determining a further application that comprises characteristics that are compatible with the operating environment of the mobile device.

Preferably, the present invention provides a method wherein, environmental data comprises data gathered from an accelerometer to determine the speed at which the mobile device to travelling.

5 Preferably, the present invention provides a method wherein, environmental data comprises data gathered from temperature sensors to determine a temperature of the operating environment which the mobile device is operating in.

10 Preferably, the present invention provides a method wherein, the received metadata comprises information concerning a time period in which the application is valid for.

15 Preferably, the present invention provides a method wherein, the inferring step further comprises determining a validity period for an application and further inferring from the validity period, the mobile device's location and gathered environmental data, further determining whether an application is compatible with the mobile device's operating environment.

20 Viewed from a second aspect the present invention provides an apparatus for deploying a contextually dependent application on a mobile device, the method comprising the steps of: an environmental data gathering component for determining a current location of the mobile device; an environmental data gathering component for gathering environmental data from the mobile device; an inference engine inferring from the mobile device's current location and the gathered environmental data an operating environment of the mobile device; a cache update component for receiving a list of applications, wherein the list comprises metadata
25 for each of the applications; an inference engine analysing the metadata to identify an application that comprises characteristics that are compatible with the operating environment of the mobile device; and an installation manager for installing the identified application on the mobile device.

30 Preferably, the present invention provides an apparatus further comprising an inference engine for determining that the application's characteristics are no longer compatible within

the mobile device's operating environment and uninstalling the application from the mobile device.

5 Preferably, the present invention provides an apparatus wherein an application comprises a predetermined geographical radius and further comprising: an inference engine for determining whether the mobile device is outside of the geographical radius and if so uninstalling the application.

10 Preferably, the present invention provides an apparatus wherein the environmental data is gathered from sensors operable on the mobile device.

15 Preferably, the present invention provides an apparatus further comprising responsive to on detecting a new location of the mobile device, determining a further application that comprises characteristics that are compatible with the operating environment of the mobile device.

20 Preferably, the present invention provides an apparatus wherein, environmental data comprises data gathered from an accelerometer to determine the speed at which the mobile device to travelling.

25 Preferably, the present invention provides an apparatus wherein, environmental data comprises data gathered from temperature sensors to determine a temperature of the operating environment which the mobile device is operating in.

30 Preferably, the present invention provides an apparatus wherein, the received metadata comprises information concerning a time period in which the application is valid for.

35 Preferably, the present invention provides an apparatus wherein, the inferring engine further comprises determining a validity period for an application and further inferring from the validity period, the mobile device's location and gathered environmental data, further determining whether an application is compatible with the mobile device's operating environment.

Viewed from another aspect, the present invention provides a server apparatus for deploying a contextually dependent application on a mobile device, the method comprising the steps of: means for determining a current location of the mobile devices; means for gathering environmental data from the mobile device; means for inferring from the mobile device's
5 current location and the gathered environmental data an operating environment of the mobile device; means for generating a list of applications, wherein the list comprises metadata for each of the applications; means for analysing the metadata to identify an application that comprises characteristics that are compatible with the operating environment of the mobile device; and means for sending the identified application to the mobile device for installation.

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Viewed from another aspect, the present invention provides a computer program comprising computer program code to, when loaded into a computer system and executed, perform all the steps of the method as described above.

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Brief description of the drawings

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

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Figure 1 is a typical client server architecture in which the present invention can be embodied;

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Figure 2 is a block diagram detailing the components of the contextual application deployment component operable on a server in accordance with a preferred embodiment of the present invention;

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Figure 3 is a block diagram detailing the component of the client side contextual verification component operable on a client device in accordance with a preferred embodiment of the present invention;

Figure 4 is a swim chart detailing the high level process steps as a client device moves from one situation to another, in accordance with a preferred embodiment of the present invention;

5 Figure 5 is a flow chart detailing the process steps of the contextual verification component of a client device, in accordance with a preferred embodiment of the present invention; and

Figure 6 is a flow chart showing the process steps of un-installation component of the client device in accordance with a preferred embodiment of the present invention.

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Detailed description of the invention

Figure 1 discloses a client and server architecture. The client and server architecture form the data processing environment 100 in which the present invention may be deployed.

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The server 105 comprises a number of processing components for processing requests received from mobile devices 110 and sending requested resources to the requesting mobile devices 110. In particular, the server 105 is configured to store metadata associated with one or more applications, wherein the metadata describes a number of characteristics associated with the application. The metadata may also comprise a URI for providing a link by which the application can be accessed.

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In an alternative embodiment, an application can be stored on the server 105 along with the application's associated metadata. Applications or metadata may be located on a single server 105 or may be geographically spread across a number of different servers 105.

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The server 105 interacts with mobile devices 110 across a number of networks 115 namely, the internet, and for example, a wireless communication network. However, the network can be any type of network in which a server can interact with a plurality of mobile devices 110 and vice versa.

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Mobile devices 110 send requests to the server 105 in order to access requested resources, such as applications. An application is a software component that is downloadable from a server 105 and installed on a mobile device 110 for further use.

5 A mobile device 110 is a device which comprises computing capabilities that enable applications to be run based on a specific platform. The mobile device 110 may comprise mobile phone capabilities integrated with the computing capabilities described above. However, for the purposes of this invention any type of mobile device 110 is applicable and which is capable of accessing a network 115 in order to download and run applications.

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Both the server 105 and each participating mobile device 110 require additional components in order to allow the invention to operate. These components are explained with reference to Figure 2 and 3.

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Starting with the server 105 of Figure 2, the server 105 comprises a context deployment component 200 comprising a registration component 205 for receiving metadata associated with an application for storing the metadata on the server 105. The metadata comprises information that describes one or more characteristics about the application, for example, the title of the application, the genre of the application, the type of platform that the application
20 will run on, a URI which states where the application can be located i.e. on another server 105, and information that describes a location or a geographical boundary or radius which is relevant to the application.

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Location information relevant to the application can take the form of a set of geofenced
25 coordinates which identifies a virtual boundary for a defined geographical area. A geofenced area can be geographically generated as in a radius around a building or a particular location point. A geofenced area can also be a predefined set of boundaries. For example, if an application was a restaurant branch finder application, the geofenced area would be the geographical area in which a particular restaurant branch is located.

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Different types of applications may comprise different characteristics. For example, a 'what to do in your area' application may comprise metadata that identifies what activities are

available depending on the weather conditions in the identified area of the mobile device 110. Therefore, a characteristic describes one or more conditions which describe the circumstances in which the application can be deployed (installed) or removed (uninstalled).

5 In another embodiment, the registration component 205 may receive an application for storing along with its associated metadata.

10 A categorisation engine 210 analyses the received metadata and categorises the metadata into a number of conditions and stores this information in a cache store 225 for storage and retrieval purposes. Thus for each mobile device 110 of type 'X', there is stored a list of the titles of applications along with the application's metadata that are suitable for running on the mobile device 110 of type X.

15 A cache request handler 215 compiles a generic list of applications that can be run on each type of mobile device 110.

20 The cache request handler 215 also requests environmental information from each mobile device 110 requesting access to an application. Environmental information comprises information from various sensors installed within the mobile device 110 or operable with the mobile device 110. One type of sensor can inform the mobile device 110 of its current location by using triangulation techniques and is obtainable from a Master Switching Control (MSC) of a wireless communication system, or location information can be obtained from a GPS system for example. Another type of sensor, an accelerometer, can provide information with regards to the current speed of travel of the mobile device. Other types of sensors can detect temperature conditions, or whether the mobile device 110 is operating within its optimal operating constraints.

25 Other types of information gathered can comprise the current date and time, the type of mobile device and the type of platform installed on the mobile device 110.

30 From this information the cache request handler 215 determines applications that are currently relevant to the mobile device 110. For example, using the mobile device's 110

location the cache request handler 215 determines one or more applications that have metadata which states that the application is for use in the determined location of the mobile device. This is achieved by the cache request handler 215 analysing the longitudinal and latitudinal coordinates of the location of the mobile device 110 and comparing these
5 references to a set of geofenced coordinates identified in metadata associated with each of the applications.

For, each set of the geofenced coordinates that are determined to be within the determined range of the set of coordinates of the mobile device 110 the cache request handler 215
10 generates a list of applications which are suitable for use in the determined location and communicates the list of determined applications and the associated metadata to the requesting mobile device 110.

In another embodiment the cache request handler 215 sets up a virtual radius or perimeter
15 boundary around the determined location of the mobile device 110. For example, the virtual boundary may be a five mile radius around the determined mobile device's 110 location.

An event handler component 220 receives location updates from each mobile device 110. These updates are received over a predetermined time period. The event handler component
20 220 communicates this information to the cache request handler 215 which maintains a log of each mobile device's location.

The cache handler component 215 determines the mobile device 110 has moved either
25 outside of the geofenced coordinates for a particular application or 'Outside of' or 'on the edge of' the defined radius for a particular application. As the mobile device 110 'drops off' or 'moves into' an application's geofenced location the cache request handler 215 updates the list of applications and communicates the a new list detailing applications that are available in the new location to a cache update component of the mobile device 110.

30 The event handler component 220 also receives information concerning the usability of an application from mobile devices 110. The information may comprise a rating associated with how useful the application was and its relevance to a determined situation. The event handler

component 220 passes this information onto the cache request handler 215 and the cache request handler 215 requests use of this information to determine which applications to include in the newly generated list. The list comprises the names and metadata of suitable applications rather than the applications themselves.

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With reference to Figure 3, the mobile device 110 comprises a number of components that interface and interact in order to provide the benefits of the present invention. The mobile device 110 comprises a contextual verification component 300 which interfaces with the contextual deployment application 200 in order to determine when relevant applications should be installed on the mobile device 110 and when the application should be removed from the mobile device 110, thereby only having applications installed on a mobile device 110 that are relevant to a situation, location, a context etc. and/or and a given time period. A time period may be any time period from a few minutes to a few days etc.

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When a mobile device 110 initially registers with the contextual application deployment service, the cache request handler 215 of the server 105 communicates to the mobile device 110 a list of applications that are available to the mobile device 110, in the mobile device's 110 determined location. This list is received by the cache update component 325 and stored in a cache store 335.

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The mobile device 110 comprises an environmental data gathering component 310 which gathers information from various sensors installed within the mobile device 110 or operable with the mobile device 110. One type of sensor can inform the mobile device 110 of its current location by using triangulation techniques and is obtainable from a Master Switching Control (MSC) of a wireless communication system, another type of sensor, an accelerometer, can provide information with regards to the current speed of travel of the mobile device. Other types of sensors can detect heat and temperature conditions, or whether the mobile device 110 is operating within its optimal operating constraints.

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Other types of information gathered can comprise the current date and time, the type of mobile device and the type of platform installed on the mobile device 110.

5 A preference engine 305 receives and stores information about preferences associated with the user of the mobile device 110. Preferences may include a type of application a user is interested in, or a time period in which the user only wishes to receive applications for automatic installation. An example is when a user is on vacation and may only wish to receive applications of interest within their vacation period.

10 A verification component 315 communicates and interfaces with the environmental data gathering component 310. The verification component periodically checks for updates to the environmental data collected by the environmental data gathering component 310, for example, the mobile device 110 is at a different location or is travelling at a faster or slower speed.

15 An inference engine 320 determines, based on a current speed and location for example, the operating environment that the mobile device 110 may currently operating in. For example, using information supplied by an accelerometer, a determination can be made that the mobile device is travelling at 80 mph and using information obtained from the MSC or a GPS system, which the mobile device is currently at location 'Winchester South'. A further lookup is performed to determine 'points of location' in a digital map and can infer from this information that, for example, the mobile device is travelling on a train.

20 An inference engine 320 creates a set of filters from the above information generated from the mobile device 110 and user generated preference information. For example, in addition to the above device information, the user of the mobile device 110 may have set a preference of 'Only show me restaurants between the times of 12:00 and 13:00 on Monday to Friday'.
25 The totality of information creates a filter or a query set in which to use to query the cache 335 on the mobile device 110.

30 A query engine 340, using the created filter, queries the list of application in the cache store for all applications that meet the set of conditions as set out in the created filter or query set.

The query engine 340 communicates a result set to the inference engine 320 for further analysis. For example, if the user is travelling on a train, the inference engine 320 from the

information received from the environmental data gathering component 310 infers that the mobile device 110 is travelling on a train in a particular direction. Therefore, the user of the mobile device 110 does not want to receive applications relating to restaurants that the train is travelling past; rather the user will only wish to receive applications that relate to food service facilities on the train. Such an application may allow a user to order food and drinks from their seat on the train and have their order delivered to them.

Once the inference engine 320 has analysed the list of available applications and each available application's associated metadata in combination with the created filter, the inference engine 320 returns to an installation manager 330 details of the application that has been identified as of relevance to the situation that the mobile device 110 is currently determined to be in.

The installation manager 330 determines from the metadata associated with the identified application, a URI which indicates a location where the application can be downloaded from. The installation manager 330 communicates a request to the server 105 which is identified in the URI requesting access to the identified application for downloading and installing on the mobile device 110. The installation manager 330 also manages all authentication requests that the server requires in order to download the application. When the application is downloaded, the mobile device 110 may generate an alert to notify the user, of the mobile device 110, that an application has been installed and is ready for use.

In another example, the inference engine 320 may return a list of a plurality of applications that are available for downloading to the mobile device 110. The user is prompted to select one of the applications from the list and the selection is communicated to the installation manager 330 for downloading.

A feedback mechanism (not shown) is provided wherein the user can vote on the usefulness of the application. This information is fed back to the inference engine 320 and the cache request handler 215 which is able to use this information to make more informed inferences in the future. For example, if the user gave feedback stating that the application was of no

relevance or not particularly useful then the inference engine 320 may not include this application in the list of applications to be downloaded.

5 As already stated the verification component 315 is periodically checking for updates to location information and updates to information provide by the sensors associated with the mobile device 110. If the verification component 315 identifies that the location information and/or the sensor information has changed, the verification component 315 communicates this information to the inference engine 320 for further analysis.

10 The verification component 315 also transmits updated location information to the event handler component 220 of the server in order for the cache request handler to determine whether a new list of applications and their associated metadata needs to be generated and communicated to the mobile device.

15 The inference engine 320 analyses the received information and determines whether the mobile device is still located within the geofenced range of the application installed on the mobile device 110.

20 If a determination is made that the application is still within the geofenced range the application is determined as still relevant and no further action is taken. However, if it is determined that the application is not with the geofenced range then a communication is sent to an un-installation manager 345 and the application is automatically uninstalled from the mobile device 110.

25 In another embodiment an application could be determined as no longer relevant to a mobile device because the application has an assigned validity period and the validity period has been determined as to of expired.

30 As already stated, the verification component 315 continuously determines whether any updates have been received with respect to environmental data, and communicates updates to the inference engine 320 for analysis. If the inference engine 320 detects that, because on a new location of a mobile device 110 that an application is not relevant and the application

is uninstalled, new relevant applications are detected and one or more of these applications are downloaded and installed on the mobile device 110.

5 In another embodiment, the mobile device 110 is configured to receive a generic list from the server 105 - the generic list being a list of all applications that are available for the type of mobile device 110. The mobile device 110 is configured to analyse the generic list of application reviewing each of the application's metadata to determine whether one or more applications are relevant to the location that the mobile device 110 is determined to be in. The mobile device 110 generates a new list, which is a subset of the generic list detailing 10 only those applications that are relevant in the determined location of the mobile device 110. Further analysis is undertaken to determine, based, on the user's preferences whether there are any applications in the list that meet location and preference requirements. If such an application is located, the name of the application and the URI of the application are communicated to the installation manager for downloading from the location identified by 15 the URI and installing on the mobile device 110.

Thus, in the above embodiment the server 105 only transmits a new list to a mobile device 110 when new applications, updates to metadata or notifications of new applications stored elsewhere are received by the server 105.

20 Figure 4 explains the dynamic and fluid nature of the present invention. A mobile device is determined as travelling through a location A and a list of applications that are available to the mobile device 110, in the mobile device's current location is communicated to the mobile device for further analysis.

25 After determining the mobile device's current location, environmental data gathered from sensors on the mobile device, and user preferences, a determination is made that App A is relevant to the mobile phone operating environment. An operating environment is an inferred situation that the mobile phone finds itself in, for example, travelling on a train, 30 travelling in a car, at a theme park or on a boat etc. App A is downloaded and installed on the mobile device 110.

The application may have a determined time period of validity for example, App A may be a restaurant menu and once the mobile device 110 is within a predefined distance to the restaurant, a determination is made as to whether the mobile device is located near the restaurant and within a time period that is the same as the period of time as determined in the validity period. For example, the validity period may be the opening times of the restaurant. If the mobile device 110 is near the restaurant and the restaurant is open, the mobile device 110 downloads the application (400).

Further determinations are made (many times a minute) to identify the mobile device's 110 current location and the mobile device's situation, for example, the mobile device 110 is identified at location B and travelling at a determined speed.

The same process as above is carried out but this time it is determined that App B is of relevance, but App A is no longer required. Therefore, App A is uninstalled from the mobile device 110 and App B is installed (405). The mobile device 110 may be identified as travelling on a train moving from location B towards location D via location C. A determination is made that App B is still relevant, for example, because App B is a cafe finder application and the only cafe available to the user is the food cart on the train. Therefore App B is retained on the mobile device and no other applications are determined of relevance (410).

As the train comes to the end of its journey at location D, App B is no longer of any relevance and therefore App B is uninstalled from the mobile device 110. However, because of the mobile device's new location App C is determined to be of relevance and App C is downloaded and installed onto the mobile device 100 (415).

Figure 5 illustrates the above process in greater detail. At steps 500 and 505, the verification component 315, periodically, requests environmental data from the environmental data gathering component 310. At step 510, the preference engine 305 determines a user's preference with respect to what types of applications they wish to use of their mobile device 110. At step 515, a set of filters are generated based on all of the above gathered information. At step 520, the verification component 315 retrieves a list of applications that

are available for use in the mobile device's current location, from the mobile device's application cache. A process (steps 525 and 530) is then initiated by which the filters are used as a set of queries in order to filter out applications that don't meet the criteria as identified in the set of queries.

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Each condition within the filter will identify an application; and the output is a result set listing a number of applications. Further filters are applied to the result set at step 550 in order to further filter out applications of no relevance to the current location and determined operating environment. A determination is made at step 545 as to whether there are any applications left to process in the result set. If the determination is negative at step 535, the remaining application is accessed, downloaded and installed.

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If at step 545, there are further applications to process, a check is made at step 565 to determine whether the application is already installed on the mobile device. If the determination is positive, a flag is raised to set the last relevant time that the application was installed in the mobile device and to determine whether the application has a set validity period (step 565). If a validity period is determined as to have expired, the application is removed from the results (step 560).

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Moving back to step 565, a further determination is made at step 570 to determine if a previous notification was raised for the application and if the determination is negative, then no further notification is to be raised for the application. If the determination is positive at step 570, then the application is removed from the result set.

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Figure 6 details the process flows of the uninstallation manager 345. At step 600 and step 605, the uninstallation manager 345 periodically requests installation records for all applications installed on the mobile device 110. At step 610, a determination is made as to whether there are any records to process. If the determination is negative, control returns to step 600. If the determination is positive, control passes to step 615 and a determination is made as to the application's installation record's time validity. A further determination is made as to whether the application is to be retained on the mobile device or removed 620.

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If the application is determined to be within the validity window and still relevant to the operating environment that the mobile device finds itself in, (or active on the device 625) then the application is retained, otherwise at step 630, the application is removed from the mobile device 110.

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Whilst the above embodiment has been described in terms of the server and the mobile device both carrying out filtering and analysis steps in order to determine an application that is contextually relevant to the mobile device, a person skilled in the art will realise that any of the above processing steps are able to be carried out entirely on a server. Thus, the server would transmit to a requesting mobile device, an application that is determined relevant to the mobile device's operating environment.

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Alternatively, all processing steps could be transferred to the mobile device, wherein the mobile device only seeks an identified contextually relevant application from a server once all filtering and analysis has been performed.

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The invention can take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment containing both hardware and software elements. In a preferred embodiment, the invention is implemented in software, which includes but is not limited to firmware, resident software, microcode, etc.

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The invention can take the form of a computer program product accessible from a computer-usable or computer-readable medium providing program code for use by or in connection with a computer or any instruction execution system. For the purposes of this description, a computer usable or computer readable medium can be any apparatus that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus or device.

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The medium can be an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system (or apparatus or device) or a propagation medium. Examples of a computer-readable medium include a semiconductor or solid state memory, magnetic tape, a removable computer diskette, a random access memory (RAM), a read only memory

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(ROM), a rigid magnetic disk and an optical disk. Current examples of optical disks include compact disk read only memory (CD-ROM), compact disk read/write (CD-R/W), and DVD.

Improvements and modifications can be made to the foregoing without departing from the scope of the present invention.

CLAIMS

1. A method of deploying a contextually dependent application on a mobile device, the method comprising the steps of:
- 5 determining a current location of the mobile device;
 gathering environmental data from the mobile device;
 inferring from the mobile device's current location and the gathered environmental data an operating environment of the mobile device;
 receiving a list of applications, wherein the list comprises metadata for each of the
10 applications;
 analysing the metadata to identify an application that comprises characteristics that are compatible with the operating environment of the mobile device; and
 installing the identified application on the mobile device.
- 15 2. A method as claimed in claim 1, further comprises determining that the application's characteristics are no longer compatible within the mobile device's operating environment and uninstalling the application from the mobile device.
- 20 3. A method as claimed in claim 1, wherein an application comprises a predetermined geographical radius and further comprising: determining whether the mobile device is outside of the geographical radius and if so uninstalling the application.
- 25 4. A method as claimed in claim 1, wherein the environmental data is gathered from sensors operable on the mobile device.
- 30 5. A method as claimed in claim 1, further comprising on detecting a new location of the mobile device, determining a further application that comprises characteristics that are compatible with the operating environment of the mobile device.
6. A method as claimed in claim 4, wherein environmental data comprises data gathered from an accelerometer to determine the speed at which the mobile device is travelling.

7. A method as claimed in claim 4, wherein environmental data comprises data gathered from temperature sensors to determine a temperature of the operating environment which the mobile device is operating in.

5 8. A method as claimed in claim 1, wherein the received metadata comprises information concerning a time period in which the application is valid for.

9. A method as claimed in claim 1, wherein, the inferring step further comprises determining a validity period for an application and further inferring from the validity
10 period, the mobile device's location and gathered environmental data and further determining whether an application is compatible with the mobile device's operating environment.

10. An apparatus for deploying a contextually dependent application on a mobile device,
15 the method comprising the steps of:

an environmental data gathering component for determining a current location of the mobile device;

an environmental data gathering component for gathering environmental data from the mobile device;

20 an inference engine inferring from the mobile device's current location and the gathered environmental data an operating environment of the mobile device;

a cache update component for receiving a list of applications, wherein the list comprises metadata for each of the applications;

25 an inference engine analysing the metadata to identify an application that comprises characteristics that are compatible with the operating environment of the mobile device; and

an installation manager for installing the identified application on the mobile device.

11. An apparatus as claimed in claim 10, further comprises an inference engine for
30 determining that the application's characteristics are no longer compatible within the mobile device's operating environment and uninstalling the application from the mobile device.

12. An apparatus as claimed in claim 10, wherein an application comprises a predetermined geographical radius and further comprising: an inference engine for determining whether the mobile device is outside of the geographical radius and if so uninstalling the application.

5

13. An apparatus as claimed in claim 10, wherein the environmental data is gathered from sensors operable on the mobile device.

10

14. An apparatus as claimed in claim 10, further comprising responsive to on detecting a new location of the mobile device, determining a further application that comprises characteristics that are compatible with the operating environment of the mobile device.

15

15. An apparatus as claimed in claim 14 wherein, environmental data comprises data gathered from an accelerometer to determine the speed at which the mobile device to travelling.

20

16. An apparatus as claimed in claim 14, wherein, environmental data comprises data gathered from temperature sensors to determine a temperature of the operating environment which the mobile device is operating in.

25

17. An apparatus as claimed in claim 10 wherein the received metadata comprises information concerning a time period in which the application is valid for.

18. An apparatus as claimed in claim 10 wherein, the inferring engine further comprises determining a validity period for an application and further inferring from the validity period, the mobile device's location and gathered environmental data, further determining whether an application is compatible with the mobile device's operating environment.

30

19. A server apparatus for deploying a contextually dependent application on a mobile device, the method comprising the steps of:

means for determining a current location of the mobile devices;

means for gathering environmental data from the mobile device;

means for inferring from the mobile device's current location and the gathered environmental data an operating environment of the mobile device;

means for generating a list of applications, wherein the list comprises metadata for each of the applications;

5 means for analysing the metadata to identify an application that comprises characteristics that are compatible with the operating environment of the mobile device; and

means for sending the identified application to the mobile device for installation.

20. A computer program comprising computer program code to, when loaded into a
10 computer system and executed, perform all the steps of the method according to any one of claims 1 to 9.

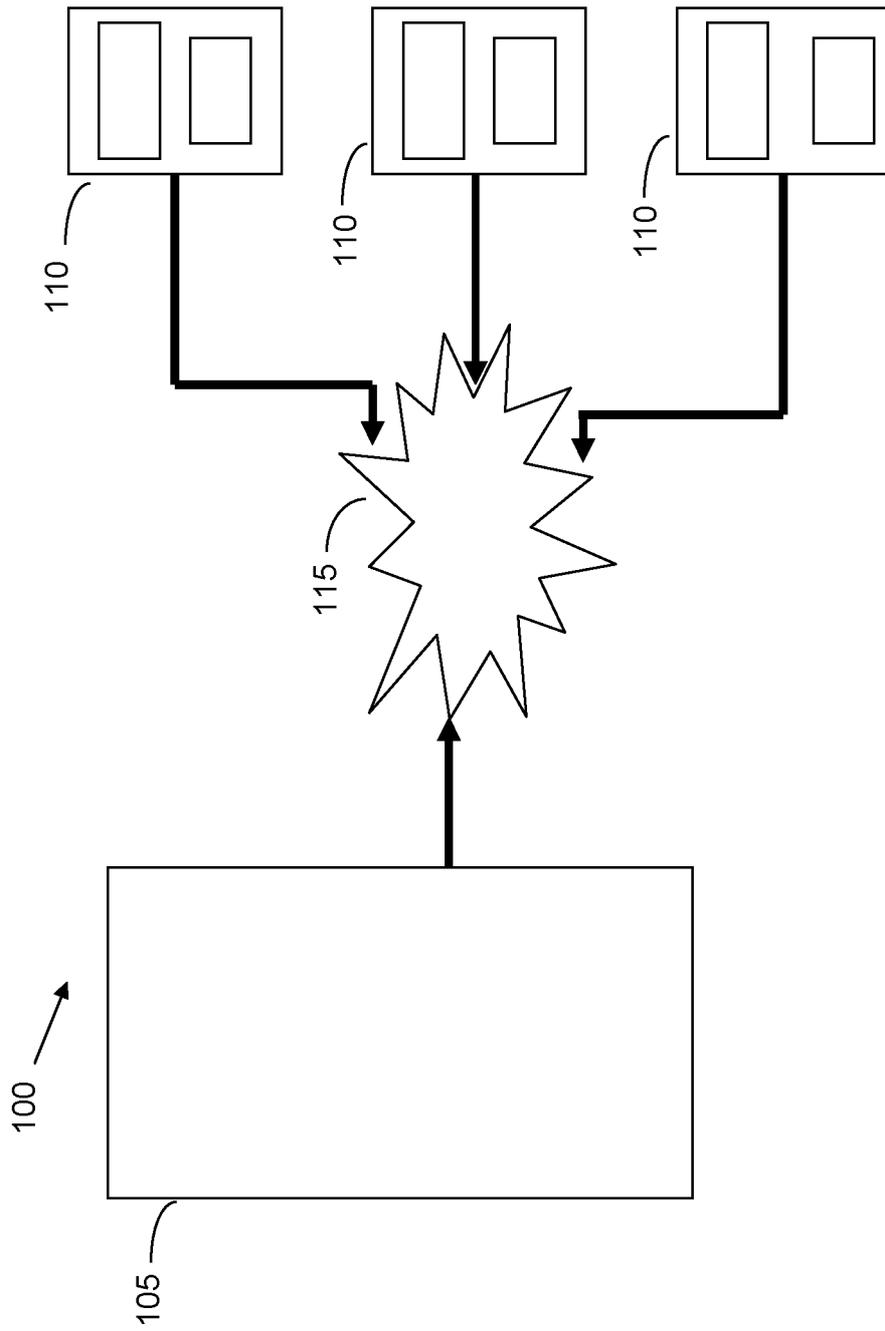


Fig. 1

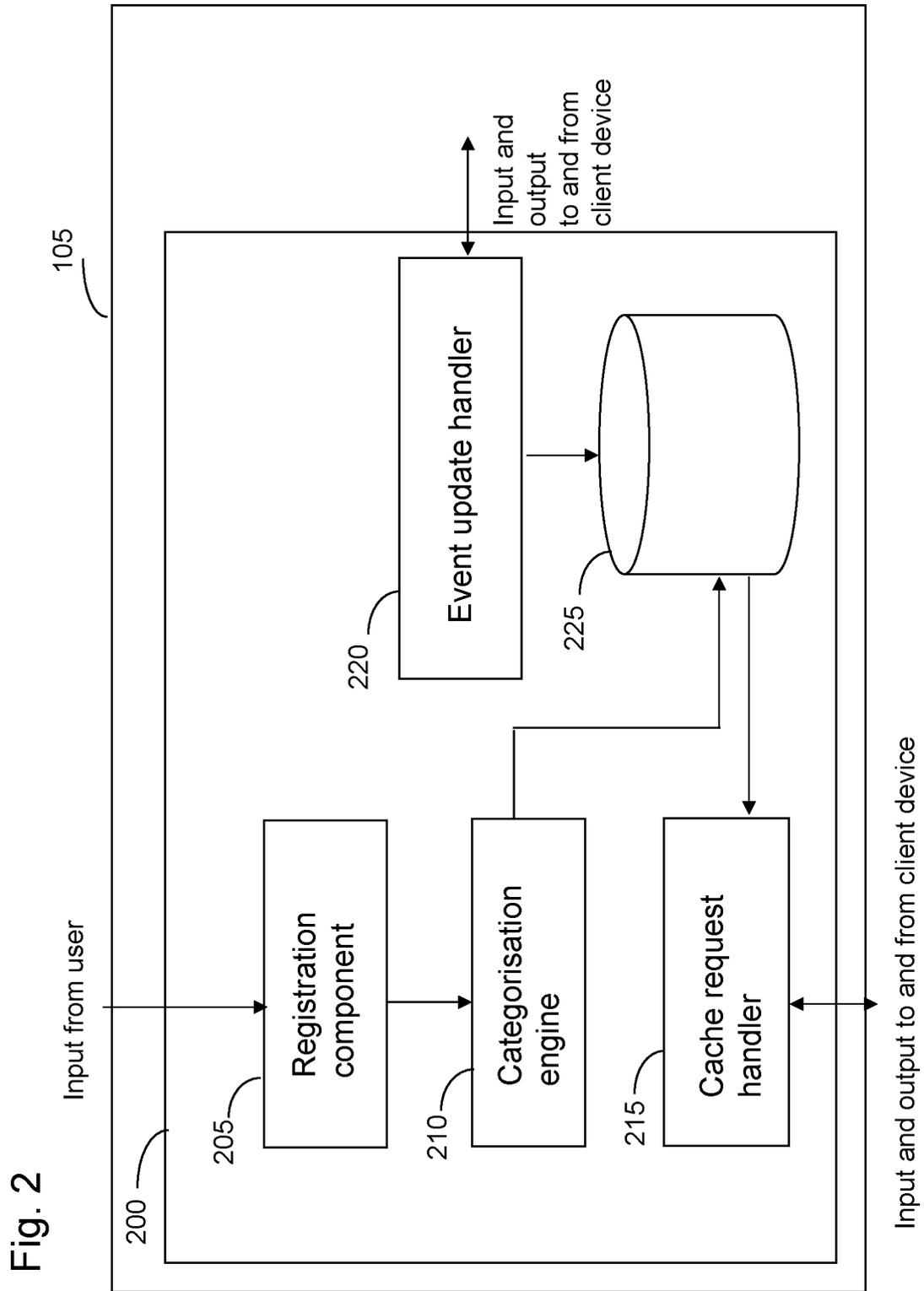


Fig. 2

Fig. 3

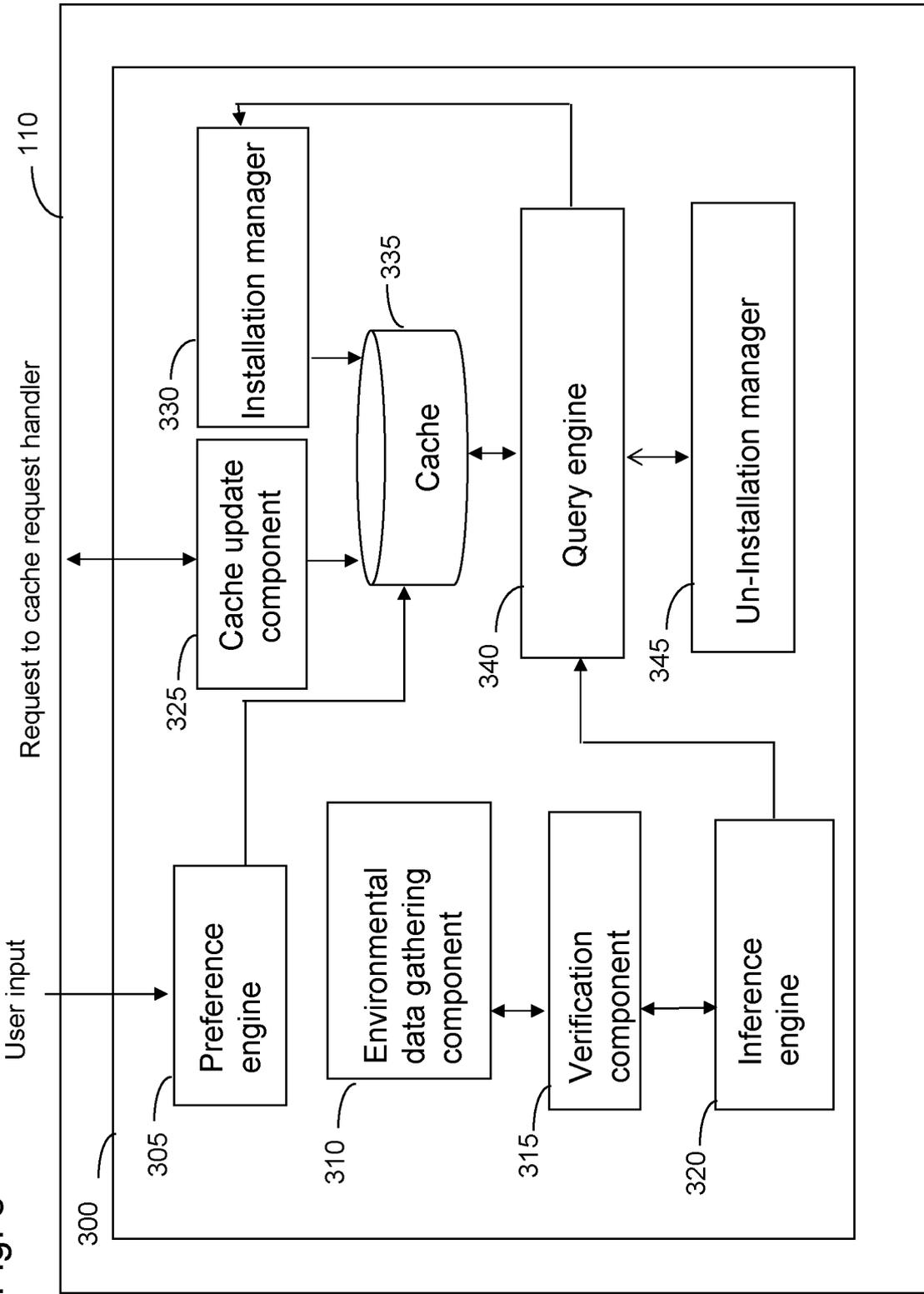


Fig. 4

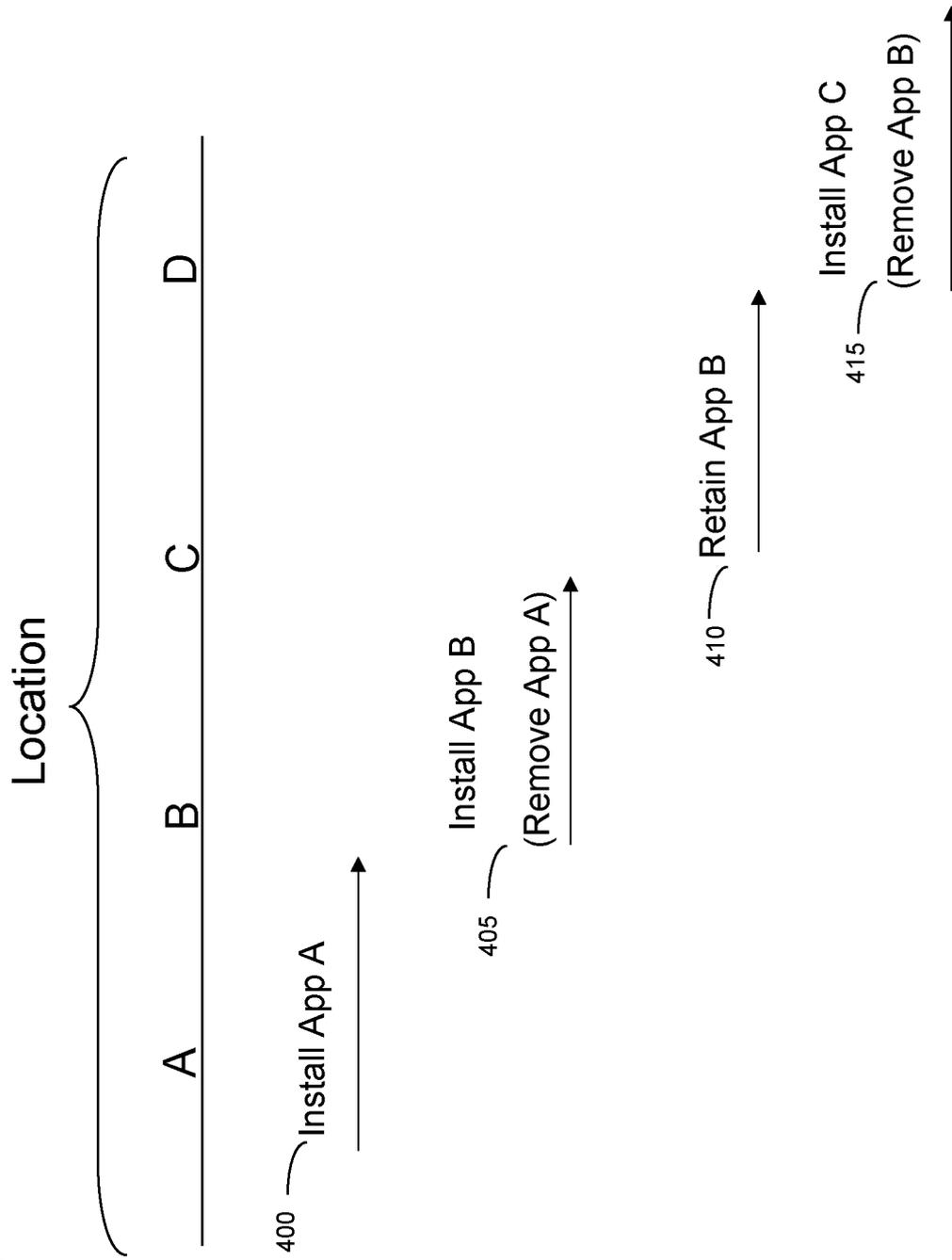


Fig. 5

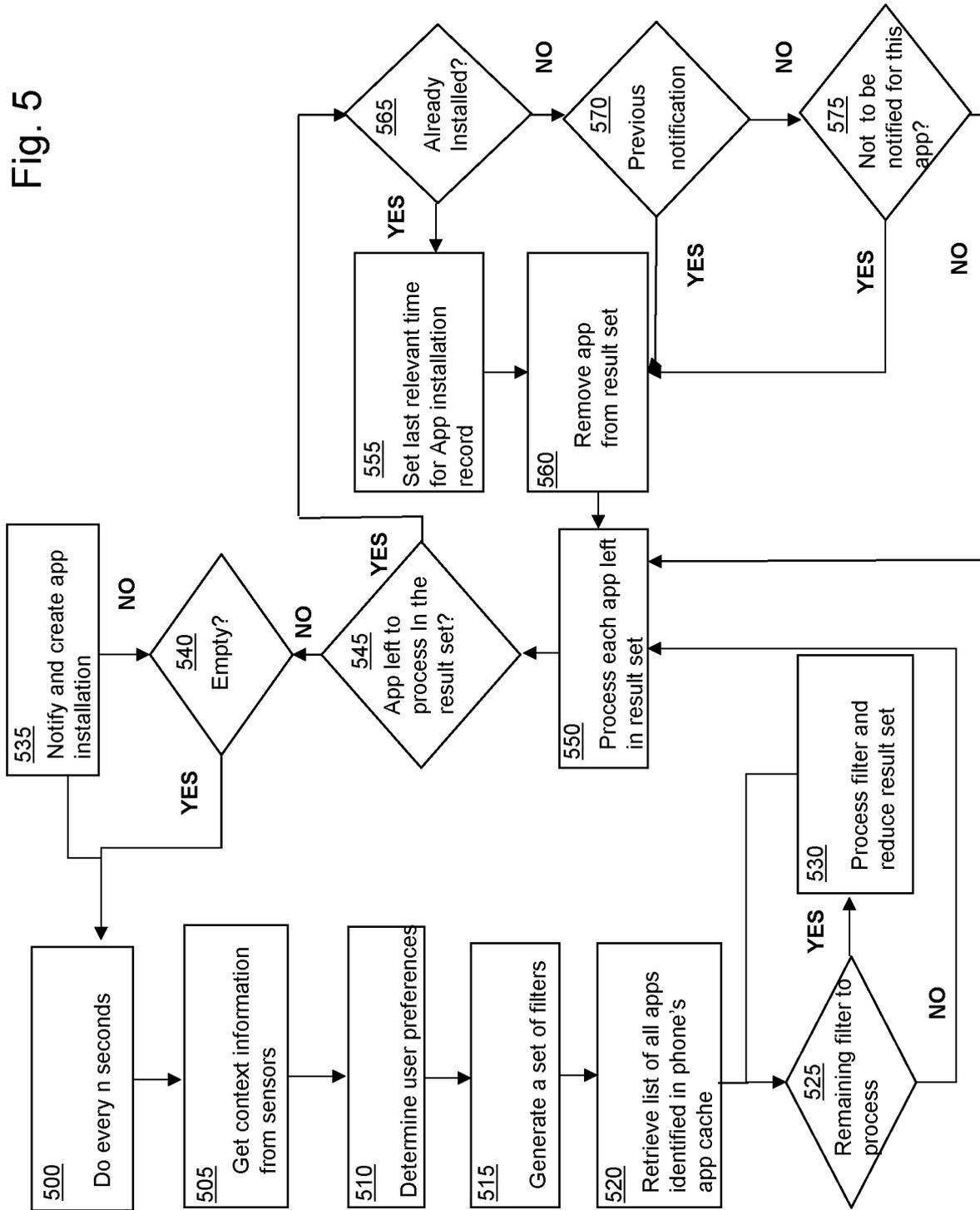
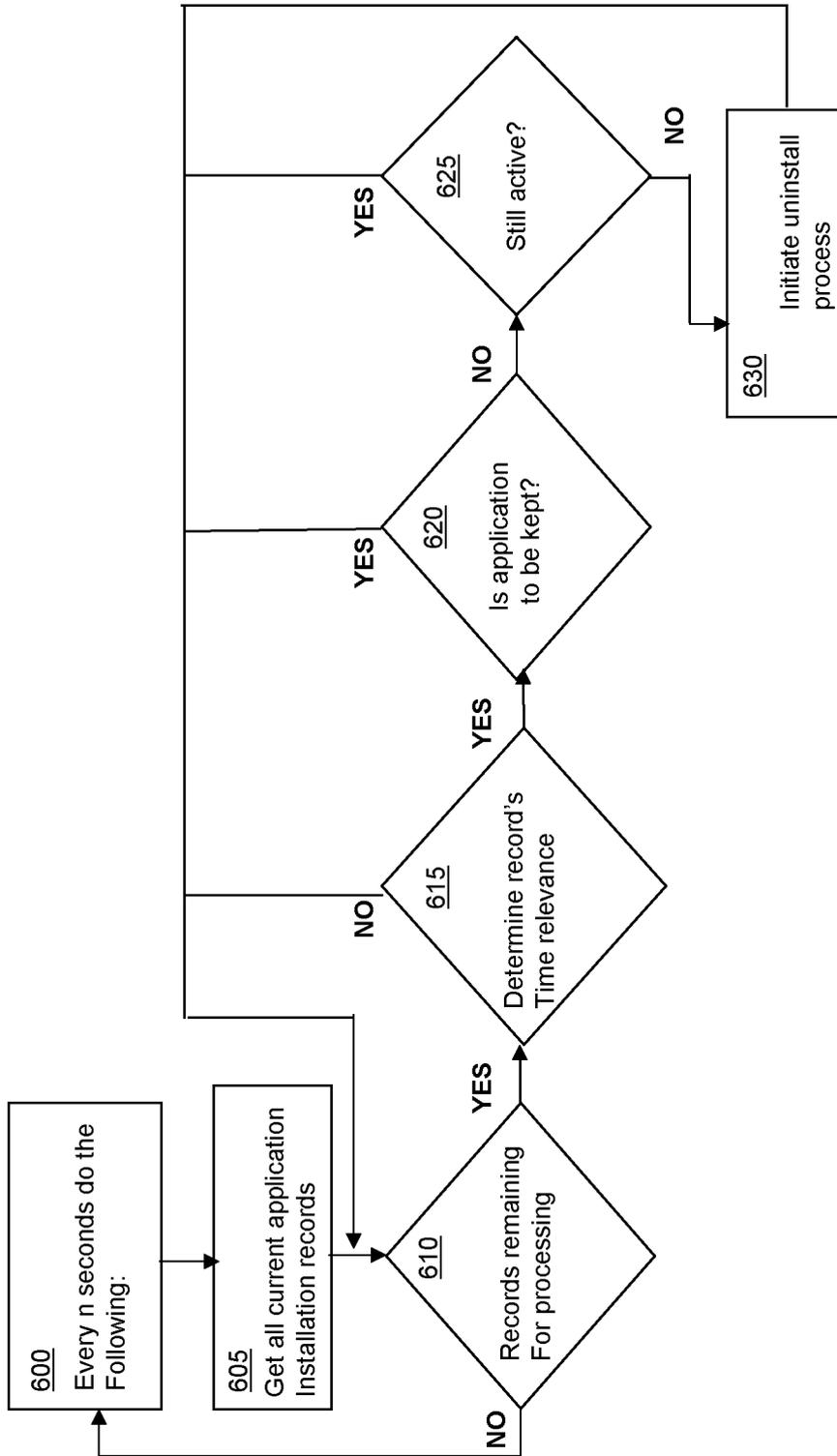


Fig. 6



INTERNATIONAL SEARCH REPORT

International application No PCT/EP2011/065598

A. CLASSIFICATION OF SUBJECT MATTER
 INV. G06F9/445
 ADD.

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

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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/222918 A1 (VANSKA MARKO [FI] ET AL VAENSKAE MARKO [FI] ET AL) 6 October 2005 (2005-10-06) paragraph [0016] - paragraph [0062] -----	1-20
A	US 2007/226343 A1 (BISHOP DONALD M [US]) 27 September 2007 (2007-09-27) paragraph [0058] - paragraph [0069]; figures 6, 7 -----	1-20
A	US 2006/101449 A1 (GATZ MICHAEL C [US]) 11 May 2006 (2006-05-11) paragraph [0031] - paragraph [0033] -----	1-20
A	US 7 206 828 B1 (BOURKE-DUNPHY ERIN M [US] ET AL) 17 April 2007 (2007-04-17) paragraph [0008] - paragraph [0011] -----	1-20

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

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 "O" document referring to an oral disclosure, use, exhibition or other means
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"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
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 "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.
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Date of the actual completion of the international search

20 October 2011

Date of mailing of the international search report

02/11/2011

Name and mailing address of the ISA/

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 Fax: (+31-70) 340-3016

Authorized officer

Bijn, Koen

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2011/065598

Patent document cited in search report	Publication date	Patent family member(s)	Publication date																																								
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