UTILITY PATENT APPLICATION

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METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

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METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

BACKGROUND

[0001] Location-aware computing allows computing devices, especially mobile computing devices such as cellular phones and mobile computers, to perform various functions based on the location of the location-aware enabled computing device. Such functions may include, for example, adapting user interfaces, tailoring software applications and/or application data, and publish data related to or based on the location of the computing device. Additionally, other devices remote from the location-aware enabled computing device may interact with the enabled device to obtain location information and perform remote functions based on such location information such as publishing the location of the user of the device.

[0002] The location of a computing device may be derived from the device itself (e.g., the computing device includes global positioning system (GPS) circuitry) or may be calculated based on functions or use of the device. In typical location-aware computing devices and associated systems, no control of the dissemination of the location information is available. As such, the use of the location information may be publicly available with little control or, in some cases, knowledge by the user of the computing device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] The invention described herein is illustrated by way of example and not by way of limitation in the accompanying figures. For simplicity and clarity of illustration, elements illustrated in the figures are not necessarily drawn to scale. For example, the dimensions of some elements may be exaggerated relative to other elements for clarity. Further, where considered

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appropriate, reference labels have been repeated among the figures to indicate corresponding or analogous elements.

[0004] FIG. 1 is a simplified block diagram of one embodiment of a mobile computing device for controlling use of context information of a user;

[0005] FIG. 2 is a simplified block diagram of a software environment of the mobile computing device of FIG. 1;

[0006] FIG. 3 is a simplified data structure of one embodiment of a context database;

[0007] FIG. 4 is a simplified data structure of one embodiment of a context policy database; and

[0008] FIG. 5 is a simplified flow diagram of one embodiment of a method for controlling use of context information of a user executed by the mobile computing device of FIG. 1.

DETAILED DESCRIPTION OF THE DRAWINGS

[0009] While the concepts of the present disclosure are susceptible to various modifications and alternative forms, specific exemplary embodiments thereof have been shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that there is no intent to limit the concepts of the present disclosure to the particular forms disclosed, but on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

[0010] In the following description, numerous specific details such as logic implementations, opcodes, means to specify operands, resource partitioning/sharing/duplication implementations, types and interrelationships of system components, and logic

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partitioning/integration choices are set forth in order to provide a more thorough understanding of the present disclosure. It will be appreciated, however, by one skilled in the art that embodiments of the disclosure may be practiced without such specific details. In other instances, control structures, gate level circuits and full software instruction sequences have not been shown in detail in order not to obscure the invention. Those of ordinary skill in the art, with the included descriptions, will be able to implement appropriate functionality without undue experimentation.

[0011] References in the specification to "one embodiment", "an embodiment", "an example embodiment", etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, but every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with an embodiment, it is submitted that it is within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

[0012] Embodiments of the invention may be implemented in hardware, firmware, software, or any combination thereof. Embodiments of the invention implemented in a computer system may include one or more bus-based interconnects between components and/or one or more point-to-point interconnects between components. Embodiments of the invention may also be implemented as instructions stored on a machine-readable medium, which may be read and executed by one or more processors. A machine-readable medium may include any mechanism for storing or transmitting information in a form readable by a machine (e.g., a computing device). For example, a machine-readable medium may include read only memory (ROM);

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random access memory (RAM); magnetic disk storage media; optical storage media; flash memory devices; and others.

[0013] Referring now to FIG. 1, a mobile computing device 100 configured to control use of context data related to a user of the device 100 includes a context policy enforcement engine 102, a processor 104, a chipset 106, and memory 108. The computing device 100 may be embodied as any type of portable computing device capable of performing the functions described herein. For example, in some embodiments, the computing device 100 is embodied a cellular phone, a personal data assistant, a laptop computer, a mobile internet device, or other computer-based mobile device.

[0014] The context policy enforcement engine 102 may be embodied as a plurality of components including hardware components, firmware components, and software components that interact cooperatively to provide amount of privacy and control over context data related to a user of the device 100 as described in more detail herein. As such, the context policy enforcement engine 102 may include a dedicated hardware processor and/or other circuitry separate from the processor 104 of the device 100. Additionally, the policy enforcement engine may include firmware instructions configured to initialize or otherwise "boot" the policy enforcement engine in a secured environment. In some embodiments, the policy enforcement engine 102 may include or otherwise be communicatively coupled to memory (not shown) separate from the main memory 108 for increased security.

[0015] The processor 104 is illustratively embodied as a single core processor having a processor core 110. However, in other embodiments, the processor 104 may be embodied as a multi-core processor having multiple processor cores 110. Additionally, the computing device 100 may include additional processors 104 having one or more processor cores 110. The

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processor 104 is communicatively coupled to the chipset 1106 via a number of signal paths 112. The signal paths 112 may be embodied as any type of signal paths capable of facilitating communication between the processor 104 and the chipset 106. For example, the signal paths 112 may be embodied as any number of wires, printed circuit board traces, via, bus, intervening devices, and/or the like. The chipset 106 may include a memory controller hub (MCH) or northbridge, an input/output controller hub (ICH) or southbridge, and a firmware device. In such embodiments, the firmware device may be embodied as a memory storage device for storing Basic Input/Output System (BIOS) data and/or instructions and/or other information.

[0016] The chipset 106 is communicatively coupled to the memory 108 via a number of signal paths 114. Similar to the signal paths 112, the signal paths 114 may be embodied as any type of signal paths capable of facilitating communication between the chipset 111222 and the memory device 108 such as, for example, any number of wires, printed circuit board traces, via, bus, intervening devices, and/or the like. The memory 108 may be embodied as one or more memory devices or data storage locations including, for example, dynamic random access memory devices (DRAM), synchronous dynamic random access memory devices (SDRAM), double-data rate dynamic random access memory device (DDR SDRAM), and/or other volatile memory devices. Additionally, although only a single memory device 108 is illustrated in FIG. 1, in other embodiments, the mobile computing device 100 may include additional memory devices.

[0017] In some embodiments, the computing device 100 may include a data storage device(s) 118, one or more peripheral devices 120, and communication circuitry 124. In such embodiments, the chipset 106 is also communicatively coupled to the data storage device(s) 118 peripheral devices 120, communication circuitry 124, and the context policy enforcement engine

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102 via signal paths 116. Again, similar to the signal paths 112, 114, the signal paths 116 may be embodied as any type of signal paths capable of facilitating communication between the chipset 112 and the data storage device(s) 118 peripheral devices 120, communication circuitry 124, and the context policy enforcement engine 102 such as, for example, any number of wires, printed circuit board traces, via, bus, intervening devices, and/or the like.

[0018] The data storage device(s) 118 may be embodied as any type of device configured for the short-term or long-term storage data such as, for example, memory devices and circuits, memory card, hard disk drives, solid-state drive, or other data storage device. The peripheral devices 120 may include any number of peripheral devices including input devices, output devices, and other interface devices. For example, the peripheral devices 120 may include a display screen and keyboard of the computing device 100. The particular devices included in the peripheral devices 120 may depend upon, for example, the intended use of the computing device. The communication circuitry

[0019] The communication circuitry 124 may be embodied as any number of devices and circuitry for enabling communications between the mobile computing device 100 and one or more remote devices. For example, the communication circuitry 124 may include one or more wired or wireless network interfaces to facilitate wired or wireless communications with the remote devices 130, 140. In some embodiments, a remote device 130 may communicate with the mobile computing device 100 over a communication path 132, which may be wired and/or wireless. Additionally or alternatively, a remote device 140 may communicate with the mobile computing device 100 over a communication path 142, which may be wired and/or wireless, via a network 1344.

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[0020] The network 144 may be embodied as any type of wired and/or wireless network such as a local area network, a wide area network, a publicly available global network (e.g., the Internet), or other network. Additionally, the network 144 may include any number of additional devices to facilitate the communication between the mobile computing device 100 and the remote device 140 such as routers, switches, intervening computers, and the like. The remote devices 130, 140 may be embodied as any type of computing devices separate from the computing device 100. For example, the remote devices 130, 140 may be embodied as one or more computers, mobile devices such as laptops, cell phones, and mobile internet devices, or other computing devices configured to communicate with the mobile computing device 100.

[0021] In some embodiments, the mobile computing device 100 may also include one or more sensors 150 communicatively coupled to the context policy enforcement engine 102 via signal paths 152. Similar to the signal paths 112, 114, 116, the signal paths 152 may be embodied as any type of signal paths capable of facilitating communication between the sensors 150 and the policy enforcement engine 102. The sensors 150 may be embodied as any type of sensor or sensor network configured to determine one or more parameters of the context of a user. For example, the sensors 150 may be embodied as any number of location sensors for determining the location of the user, biometric sensors for determining biometric data of the user, temperature sensors, altitude sensors, radio frequency identification (RFID) transmitters and/or receivers, data scanners or readers, and/or other sensors and/or devices for configured to sense or otherwise gather data indicative of a parameter of the context of the user. Further, it should be appreciated that the computing device 100 may include other components, sub-components, and devices not illustrated in FIG. 1 for clarity of the description.

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[0022] As discussed above, the computing device 100 is configured to facilitate control of the use of context information of the user. For example, the computing device 100 may control the use of context information requested by the remote devices 130, 140 and/or otherwise provided by the mobile computing device 100 and/or other devices and/or sensors. The context information may include any information or data that defines the context of the user such as, for example, the location, activity, or environment of the user. For example, in some embodiments, the context of the user may be defined by a plurality of context parameters that each defines a particular aspect of the context of the user at a particular point in time. Such context parameters may include, for example, the location of the user, the current activity of the user, environmental data of the environment in which the user is located, biometric data of the user, and the like. Additionally, each context parameter may have one or more characteristics associated therewith that define the level of specificity of the context parameter. Such characteristics may include, for example, the granularity of the context parameter data (e.g., what city is the user located in , what building is the user located in, what are the GPS coordinates of the user, etc.), the confidence of the context parameter (e.g., what is the likelihood that the context parameter data is accurate, what data collection methods were used, etc.), and the currency of the context parameter data (e.g., when was the data collected, how old is the data, when is the next context update, etc.). Of course, it should be appreciated that the context of the user may be defined other context schemas, data structures, and data in other embodiments.

[0023] Referring now to FIG. 2, in use, the mobile computing device 100 includes a plurality of software modules, applications, and/or programs to facilitate control of the use of context information of the user. As discussed above, the context policy enforcement engine 102 may be embodied as hardware, firmware, and/or software modules and devices. In the

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illustrative embodiment, the context policy enforcement engine 102 includes an application program interface 200 to facilitate interaction between the context policy enforcement engine 102 and local applications 202 and/or remote applications 204, 206. The local applications 202 may be embodied as any software or firmware applications executed on the mobile computing device 100 that request context information related to the user of the device 100. Similarly, the remote applications 204, 206 may be embodied as any software or firmware applications executed on the remote devices 130, 140 that request context information related to the user of the device 100. The remote application 204 may request such context information from the mobile computing device 100 over the communication path 132 and the remote application 206 may request the context information from the device 100 over the communication path 142.

[0024] The mobile computing device 100 also includes a context database 220 and a context policy database 222. The databases 220, 222 may be embodied as data stored in a suitable data structure and location such as, for example, a relational database, a flat file database, or data stored in the memory 108 and/or data storage 118. In some embodiments, the context database 220 and/or the context policy database 222 may be encrypted or otherwise include some form of security.

[0025] The context data may be stored in the context database 220 in any suitable data form or schema. For example, one embodiment of a data structure or schema 300 for storing the context data related to the user is shown in FIG. 3. As discussed above, in some embodiments, the context of the user may be defined by a plurality of context parameters (e.g., location, activity, environmental aspects, etc.), each having an associated characteristic (e.g., granularity, confidence, currency, etc.). For each parameter-characteristic combination, context data of varying levels of specificity may be stored or otherwise determined such that requests for context

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data may be responded to with context data having a selected level of specificity as desired by the user. For example, in one embodiment, the context data structure 300 may include context data 302 that defines three levels of specificity for the granularity characteristic of the location context parameter. As shown, the location granularity includes a high granularity level indicating that the user is at a particular GPS coordinate location, a middle granularity level indicating that the user is inside a particular building at work, and a low granularity level indicating that the user is simply at work. As discussed in more detail below, the user and/or policy enforcement engine 102 may select the level of specificity of the context data to provide the requesting application or entity based on the context policy rule data. As such, the user may decide to provide only low level of granularity of the location of the user to, for example, publicly available applications (e.g., a Twitter® application). Alternatively, the user or computing device 100 may decide to provide a high level of granularity of the location of the user if the requesting application is an application at work or from a family member as discussed in more detail below.

[0026] The illustrative context data structure 300 also includes a context data 304 that defines three levels of specificity for the confidence characteristic of the location context parameter. The illustrative confidence characteristic includes a high granularity level indicating the user swiped his RFID tag at an entry door to a particular room, which provides a high degree of confidence that the user is actually within the room or at a GPS coordinate within the room. The illustrative confidence characteristic also includes a middle granularity level indicating that the user swiped his RFID inside at an entry door to a particular building at work, which provides a degree of confidence that the user is within that particular building. Additionally, the illustrative confidence characteristic includes a low confidence level indicating the user accessed

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a wireless access point that includes the building (but may include other buildings within the work campus area).

[0027] The illustrative context data structure 300 additionally includes a context data 306 that defines three levels of specificity for the currency of the location context parameter. The illustrative currency characteristic includes a high currency level indicating that a room entry door RFID scanner was activated recently, a middle currency level indicating that a wireless access point was accessed a particular time prior to the high currency level event, and a low currency level indicating that the user activated the entry door RFID scanner to the building earlier that morning.

[0028] The illustrative context data structure 300 may include additional data related to additional context parameters the define the context of the user of the mobile computing device 100. For example, as shown in FIG. 3, the context data structure may include context data 308 defining the granularity characteristic of the activity context parameter, a context data 310 defining the confidence characteristic of the activity context parameter, a context data 320 defining the currency characteristic of the activity context parameter, and any other context data used to define the current or historical context of the user. It should be appreciated, however, that the context data structure 300 is just one of several data schema that may be used to store the context data related to the user. In other embodiments, other data structures or schema may be used. For example, in some embodiments, the context data may be stored with more or less levels of specificity for each context parameter, without use of context parameter characteristics (e.g., the context location parameter is defined simply as the GPS coordinates the user, the building in which the user is currently located, etc.), or using some other data stricture or schema depending on the particular application and implementation of the mobile computing device 100.

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Additionally, in some embodiments, the context data of the user may not be stored, but rather collected on an "as needed" basis. For example, the location of the user of the mobile computing device may be determined upon receipt of a request for the context data rather than prior thereto.

[0029] The context policy database 220 includes a set of context policy rules that define how the computing device 100 is to respond to requests for context information of the user from, for example, the applications 202, 204, 206. The context policy rules may dictate how to respond to the context request based on any appropriate data such as data related to the requesting entity (e.g., which application is requesting the data, the identity of the requesting entity, etc.), current or historical context data (e.g., the current location or activity of the user), or other data related to the context of the user (e.g., the time of day, day of the week, etc.). As described above, in some embodiments, the context data may include multiple levels of specificity of context data and, in such embodiments, the context policy rules may define which level of specificity (e.g., which level of location granularity) is to be provided to the requesting application or entity.

[0030] The context policy rules may be embodied as any type of rule, collection of rules, and/or the like that define how the computing device 100 should respond to various requests for context data. As discussed above, the rule decisions may be based on various parameters and/or data including, but not limited to, the type of application requesting the context data, the identification of the requesting entity, the location of the requesting entity, the predefined group with which the requesting entity/application is associated, other context data of the user, and/or other environmental or other data that defines the context of the user. Additionally, the structure of the context policy rules may varying depending on the application and implementation of the mobile computing device 100.

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[0031] One illustrative embodied of a context policy rule schema or data structure 400 is illustrated in FIG. 4. The illustrative context policy rule schema 400 includes a plurality of context policy rules 402, 404, 406, 408, 410, 412 that define how the computing device 100 should respond to requests for context data (e.g., what content of context data should be delivered to the requesting application or entity). For example, context policy rule 402 defines the level of specificity for each characteristic for the location parameter of the context of the user. In this embodiment, if the requesting entity (e.g., application, company, or individual) belongs to the a group called "work" and if the user of the computing device 100 is current at work, then the context data defined as having a high confidence, high granularity, and high currency may be provided to the requesting application or entity. As discussed above, in some embodiments, the context data stored in the context database 220 may include data entries for each level of specificity. However, in other embodiments, the context data may be determined based on the policy rule 402 in response to the request for context data. That is, the context policy rule 402 defines the level of specificity of the context parameter that must be determined to respond to the request.

[0032] In some embodiments, the context policy rules 400 may also include binary type rules that allow or disallow access to particular context data, rather than defining the specificity of the data or the data itself. For example, the context policy rule 402 includes a definition for the access characteristic of the activity context parameter that allows applications in the group "work" to have access to the context data related to the activity of the user when the user is located at "work." Additionally, the context policy rules 400 may include other rules such as policy rules 404 and 406 that define how the mobile computing device 100 should respond to requests from entities associated with other groups such as the group "family" and the group

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"public." Such groups may be defined be predefined, defined by the user, or defined by the requesting application or entity.

[0033] In some embodiments, the context policy rules 400 may also define an action to be taken by the mobile computing device 100 in addition to or in place of context data. For example, the context policy rule 406 defines the confidence characteristic of the location parameter as requiring a token to prove the location of the user. As such, the mobile computing device 100 may be configured to transmit a software token that was previously received as proof of the location of the user to the requesting application/entity (e.g., remote applications 204, 206). Additionally, the context policy rules 400 may use any number of rule qualifiers to define the rule itself. For example, the context policy rule 412 defines context data that should be provided to a requesting application if the requesting person is identified as "spouse", the user's activity is "shopping", and the user is currently located in a location identified as "flower shop." As shown, the context policy rule 412 provides a low granularity for the location parameter such that the requesting entity cannot determine exactly where the user is (e.g., so as not to run a well planned surprise). Although the context policy rules 400 define an illustrative set of context policy rules, it should be appreciated that the context policy rules may include additional or other context policy rules having the same or other rule form may be used. Additionally, in some embodiments, the context database 220 and the context policy database 222 may be combined in a single database in which the context policy rules directly define or identify the context data to be used to respond to a request for context data of the user given the particular qualifiers identified in each context policy rule.

[0034] Referring back to FIG. 2, the mobile computing device 100 may additionally include a user interface 210, which is usable by the user to interact with the policy enforcement

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engine 102, the context database 220, and/or the context policy database 222. The user interface 210 may be embodied as any suitable user interface, such as a graphical user interface (GUI), that facilitates interaction between the user and the mobile computing device 100. The user interface 210 may be configured, for example, to allow the user to add, delete, update, or otherwise modify the context policy rules included in the context policy rule database. For example, the user may decide to allow access all applications in the "public" group to location context data having high granularity. If so, the user may interact with the user interface to update the associated context policy rule. Additionally, the user may define which requesting applications or entities below to which group or otherwise define groups or associations of applications and entities with which various context policy rules may be created and defined.

[0035] In some embodiments, the policy enforcement engine 102 may allow the user to update context data related to the user and stored in the context database. For example, in certain circumstances, some of the context data may be unavailable through automatic collection means (e.g., location via a GPS sensor). In such cases, the user may supply, update, modify, or correct the context data or otherwise add additional details related to the context data via use of the user interface. For example, if the user is at a particular flower shop, the user may enter the name of the flower shop rather than the generic "flower shop" location tag such that authorized requesting applications have access to more specific or other an increased amount of context data.

[0036] In some embodiments, the mobile computing device 100 may also include a data input 212, which may be embodied as any type of data input the delivers context data to the policy enforcement engine 102. For example, in embodiments wherein the mobile computing device 100 includes sensor(s) 150, the data input 212 may be embodied as the sensor data from such sensors 150. For example, the sensors 150 may provide contextual data related to the user's

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environment, such as temperature, altitude, or location, to the policy enforcement engine 102. In response, the policy enforcement engine 102 updates the context data stored in the context database 222.

[0037] Referring now to FIG. 5, in use, the mobile computing device 100 may be configured to execute a method 500 for controlling use of context data related to a user of the device 100. The method 500 may be executed by, for example, the policy enforcement engine 102 and/or the processor 104. The method 500 begins with step 502 in which a request for user context is received from an application such as the local application 202 or remote applications 204, 206. In block 504, the computing device 100 may be configured to validate the context request based on the context policy rules stored in the context policy rule database 222. The request for user context may be validated by any suitable mechanism to ensure that the request is for context data of the user of the device 100 and is otherwise authorized to receive context data of some level of specificity. As such, the user of the device 100 may simply ignore or otherwise refuse to respond to requests for context data received from particular requesting applications or entities, during particular time periods of the day, on particular days, or based on some other predetermined criteria.

[0038] If the request is not authorized in block 506, the method 500 loops back to block 502. However, if the request for context data is authorized in block 506, the context data is determined in block 508 based on or according to the context policy rules stored in the context policy rule database 222. That is, the context data that is to be provided to the requesting application or entity is determined in block 508. As discussed above, one or more context policy rules of the context policy rule database 222 may be used to determine which and how much of the context data stored in the context database 220 should be provided to the requesting

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application/entity. For example, referring to the illustrative embodiment of FIGS. 3 and 4, if the requesting application belongs to group "public" and the user is currently in the location defined as "work," the parameter characteristic is defined as LOW and as such the context location that may be provided to the requesting application is identified as "Work" in the context data 300.

[0039] Referring back to FIG. 5, in block 510, the mobile computing device 100 responds to the requesting application or entity with the context data determined in block 508. To do so, the mobile computing device 100 may be configured to transmit the context data to the requesting application in sub-block 512. Additionally or alternatively, if the context policy rule defines an action or restriction of an action, the mobile computing device 100 may be configured to authorize or deny the requested action in 514. For example, in embodiments wherein the mobile computing device 100 is embodied as a cellular telephone and the context policy rules dictate that no ringer should be used when the user's current activity context is defined as "meeting," a local ringer application executed on the device 100 may request authorization to activate the ringer of the cell phone from the policy enforcement engine 102. In response, the policy enforcement engine would authorize or deny the ringer application based on the location of user at the time of the request (i.e., based on the context policy rules and the context data of the user). As such, the mobile computing device 100 is configured to control the user of context information related to the user by establishing a context policy engine 102 that determines the response to such request based on a set of policy rules included in the context policy rule database 222.

[0040] While the disclosure has been illustrated and described in detail in the drawings and foregoing description, such an illustration and description is to be considered as exemplary and not restrictive in character, it being understood that only illustrative embodiments have been

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shown and described and that all changes and modifications that come within the spirit of the disclosure are desired to be protected.

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CLAIMS:

1. A method comprising:

establishing a context policy enforcement engine on a mobile computing device;

receiving a request for context information related to a user of the mobile computing device,

retrieving context policy data with the context policy enforcement engine, the context policy data defining a set of rules for responding to context requests; and

responding to the request for context information based on the context policy data.

2. The method of claim 1, wherein establishing a context policy enforcement engine comprises establishing the context policy enforcement engine in a secured boot environment.

3. The method of claim 1, wherein the establishing the context policy enforcement engine comprises establishing the context policy enforcement engine in software.

4. The method of claim 1, wherein receiving the request for context information comprises receiving the request for context information from a software application.

5. The method of claim 1, wherein receiving the request for context information comprises receiving a request for at least one of: a location of the user, an activity of

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the user, an aspect of the environment in which the user is located, and biometric data related to the user.

6. The method of claim 1, wherein receiving the request for context information comprises receiving a request for (i) the location of the user and (ii) at least one additional context parameter related to the user.

7. The method of claim 1, wherein:

receiving the request for context information comprises receiving the request from a requesting entity; and

the context policy data defines a context policy rule based on the identification of the requesting entity.

8. The method of claim 7, wherein the context policy data defines a rule based on a predetermined group of requesting entities.

9. The method of claim 1, wherein the context policy data defines a rule based on a context parameter associated with the user.

10. The method of claim 1, wherein the context policy data defines a rule based on the requested context information and a location of the user at the time of receiving the request for context information.

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11. The method of claim 1, wherein the context policy data defines a rule based on the requested context information and the time of day at which the request for context information is received.

12. The method of claim 1, wherein the context policy data defines a rule based on the requested context information and an activity of the user.

13. The method of claim 1, wherein responding to the request comprises determining context data based on the set of rules of the context policy data.

14. The method of claim 13, wherein responding to the request further comprises retrieving the context data from a context database with the context policy enforcement engine based on the set of rules of the context policy data.

15. The method of claim 14, wherein responding to the request further comprises transmitting the context data.

16. The method of claim 13, wherein determining the context data comprises selecting context data from a plurality of datum defining a context parameter of the user, the plurality of datum having different levels of specificity defined in the set of rules of the context policy data.

17. The method of claim 13, wherein:

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a context of the user is defined by a plurality of context parameters and the context policy data defines the set of rules based on a plurality of parameter characteristics associated with each context parameter,

determining the context data comprises determining the context data for at least one of the parameter characteristics defined in the context policy data.

18. The method of claim 1, further comprising:

receiving user-supplied context policy rule with the mobile computing device, and

updating the context policy data with the user-supplied context policy rule with the context policy enforcement engine.

19. The method of claim 1, further comprising:

receiving user-supplied context data related to the user with the mobile computing device, and

updating a context database stored on the mobile computing device with the user-supplied context data.

20. The method of claim 1, further comprising:

receiving context data related to the user from a source remote to the mobile communication device; and

updating a context database stored on the mobile computing device with the user-supplied context data.

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21. A machine readable medium comprising a plurality of instructions, that in response to being executed, result in a computing device:

establishing a context policy enforcement engine on a mobile computing device;

retrieving context policy data with the context policy enforcement engine in response to receiving a request for context information related to a user of the computing device, the context policy data defining a set of rules for responding to context requests; and

responding to the request for context information based on the context policy data.

22. The machine readable medium of claim 21, wherein responding to the request comprises determining context data based on the set of rules of the context policy data.

23. The machine readable medium of claim 22, wherein responding to the request further comprises retrieving the context data from a context database with the context policy enforcement engine based on the set of rules of the context policy data.

24. The machine readable medium of claim 22, wherein determining the context data comprises selecting context data from a plurality of datum defining a context parameter of the user, the plurality of datum having different levels of specificity defined in the set of rules of the context policy data.

25. A mobile computing device comprising:

a context policy enforcement engine;

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a processor; and

a memory device having stored therein a plurality of instructions, which when executed by the processor, cause the context policy enforcement engine to:

retrieve context policy data in response to receiving a request for context information related to a user of the computing device, the context policy data defining a set of rules for responding to context requests;

determine context data related to a user of the mobile computing device based on the set of rules of the context policy data; and

respond to the request for context information with the determined context data.

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ABSTRACT OF THE DISCLOSURE

A method and device for controlling use of context information of a user includes establishing a context policy enforcement engine on a mobile computing device. The context policy enforcement engine may be embodied as software and/or hardware components. The context policy enforcement engine retrieves context policy data in response to receiving a request for context information related to a user. The context policy data defines a set of context rules for responding to context requests. The context policy enforcement engine responds to the request based on the set of context rules.

Petitioner Samsung Ex-1004, 0026

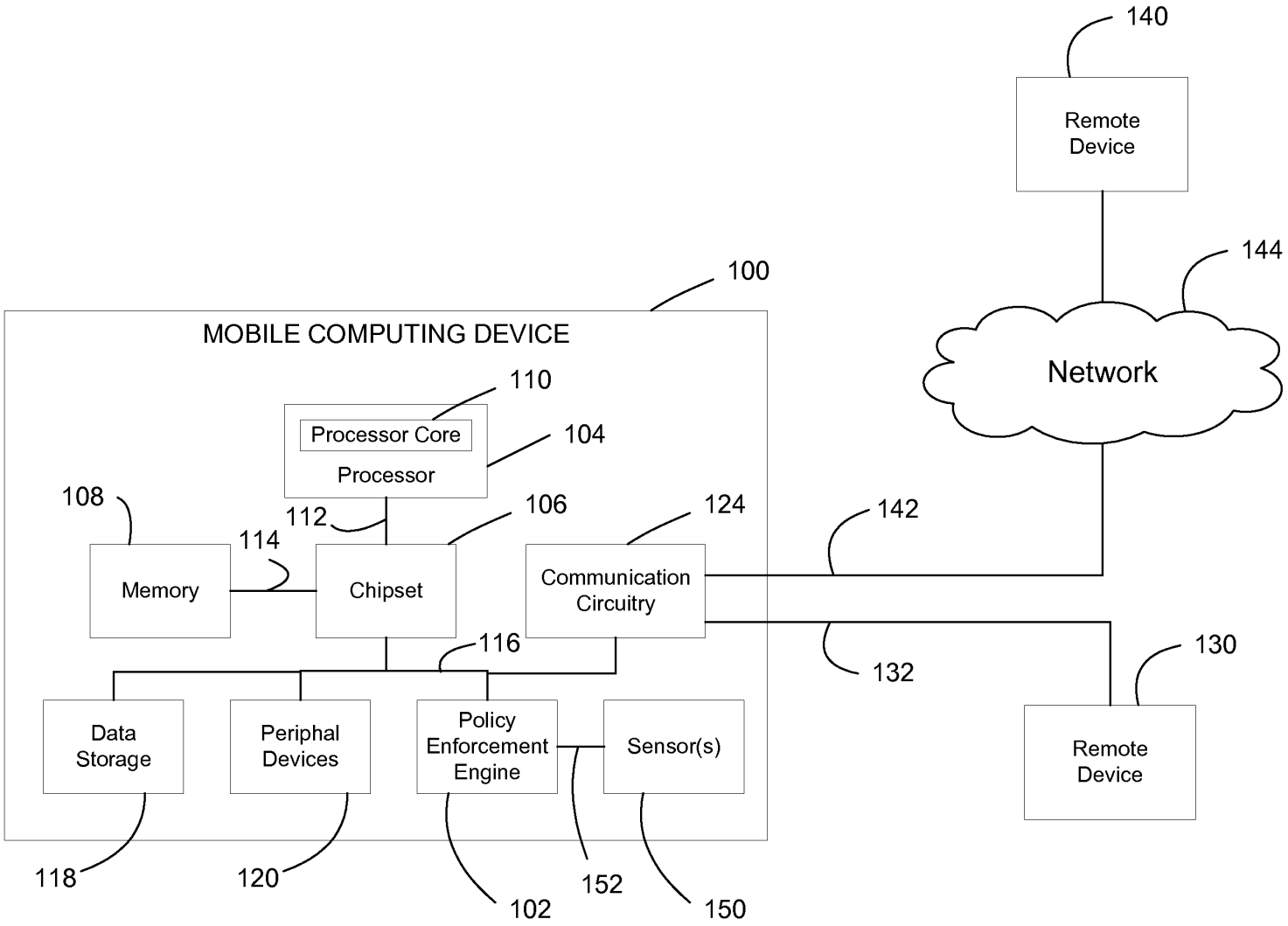


FIG. 1

Petitioner Samsung Ex-1004, 0027

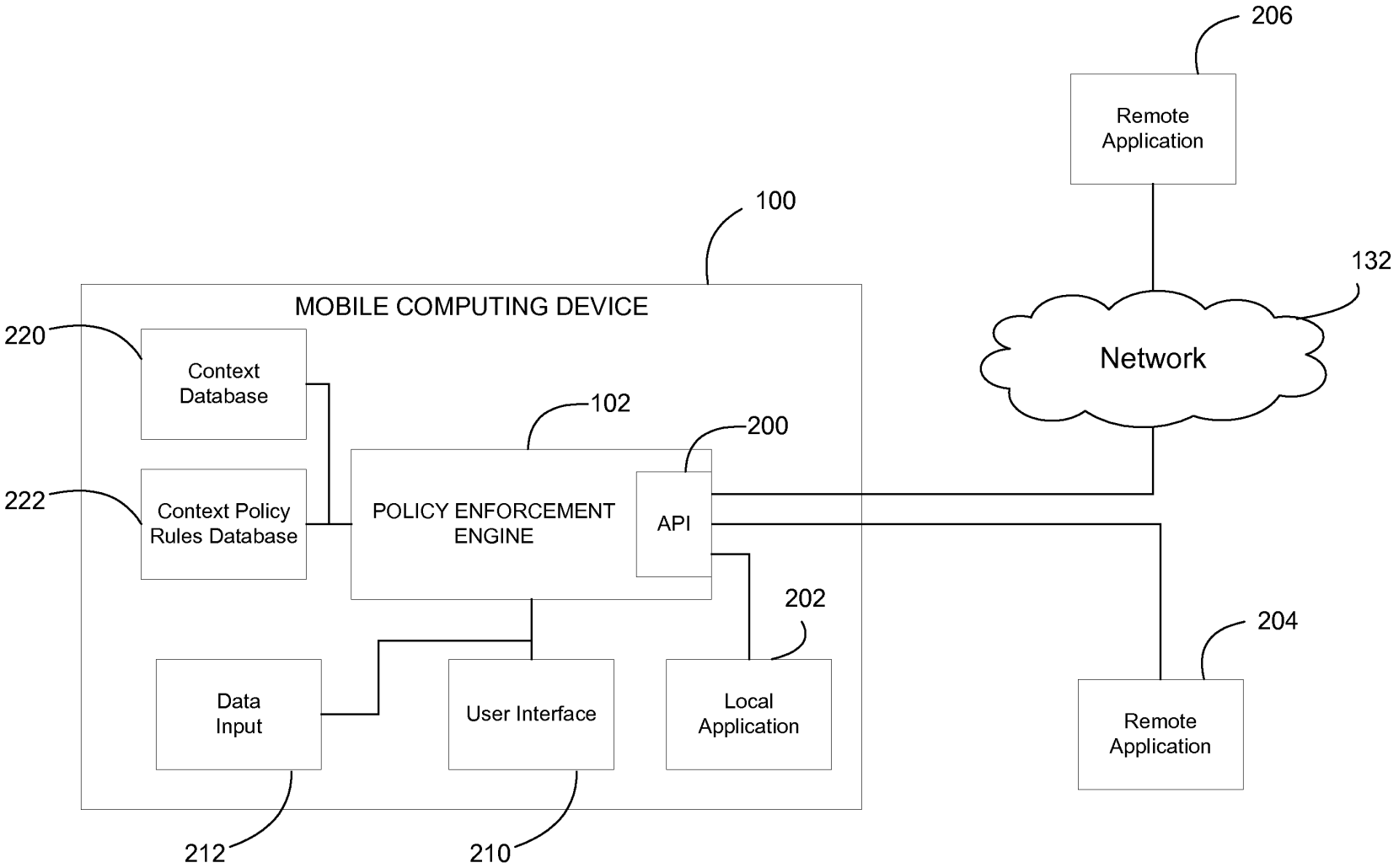


FIG. 2

Petitioner Samsung Ex-1004, 0028

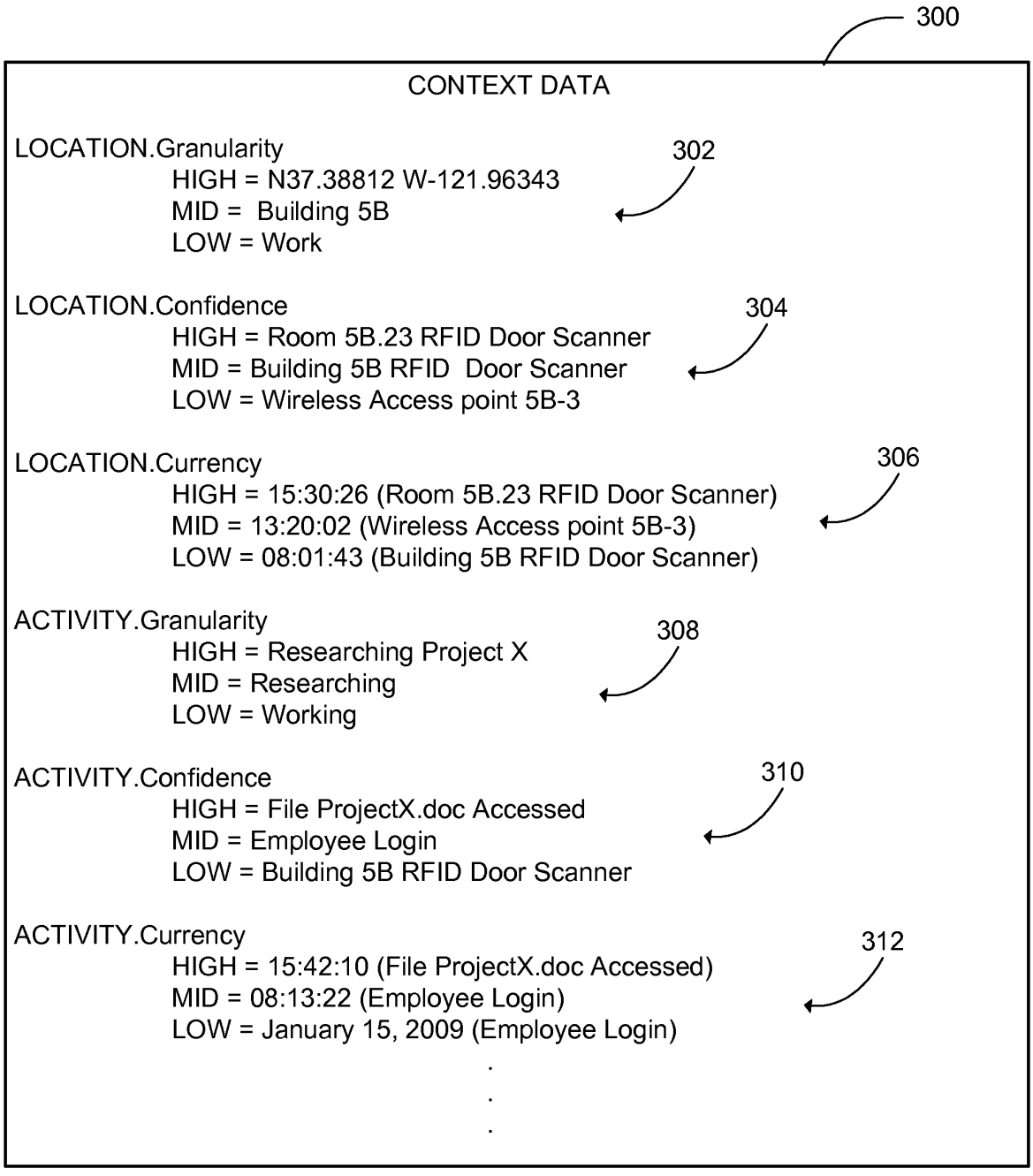

300
CONTEXT DATA
LOCATION.Granularity
HIGH = N37.38812 W-121.96343
MID = Building 5B
LOW = Work
302
LOCATION.Confidence
HIGH = Room 5B.23 RFID Door Scanner
MID = Building 5B RFID Door Scanner
LOW = Wireless Access point 5B-3
304
LOCATION.Currency
HIGH = 15:30:26 (Room 5B.23 RFID Door Scanner)
MID = 13:20:02 (Wireless Access point 5B-3)
LOW = 08:01:43 (Building 5B RFID Door Scanner)
306
ACTIVITY.Granularity
HIGH = Researching Project X
MID = Researching
LOW = Working
308
ACTIVITY.Confidence
HIGH = File ProjectX.doc Accessed
MID = Employee Login
LOW = Building 5B RFID Door Scanner
310
ACTIVITY.Currency
HIGH = 15:42:10 (File ProjectX.doc Accessed)
MID = 08:13:22 (Employee Login)
LOW = January 15, 2009 (Employee Login)
312

FIG. 3

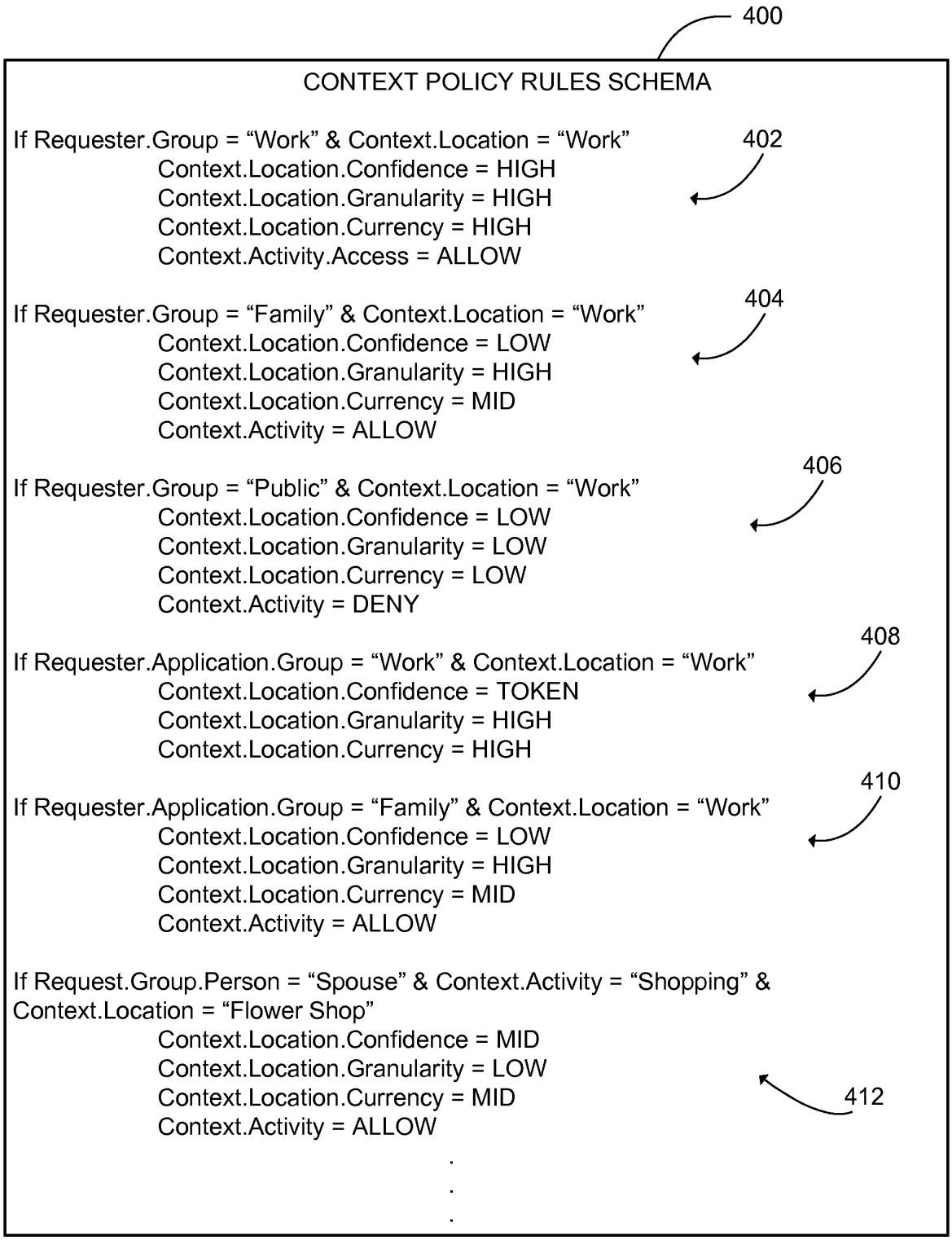

400
CONTEXT POLICY RULES SCHEMA
If Requester.Group = “Work” & Context.Location = “Work”
Context.Location.Confidence = HIGH
Context.Location.Granularity = HIGH
Context.Location.Currency = HIGH
Context.Activity.Access = ALLOW
402
If Requester.Group = “Family” & Context.Location = “Work”
Context.Location.Confidence = LOW
Context.Location.Granularity = HIGH
Context.Location.Currency = MID
Context.Activity = ALLOW
404
If Requester.Group = “Public” & Context.Location = “Work”
Context.Location.Confidence = LOW
Context.Location.Granularity = LOW
Context.Location.Currency = LOW
Context.Activity = DENY
406
If Requester.Application.Group = “Work” & Context.Location = “Work”
Context.Location.Confidence = TOKEN
Context.Location.Granularity = HIGH
Context.Location.Currency = HIGH
408
If Requester.Application.Group = “Family” & Context.Location = “Work”
Context.Location.Confidence = LOW
Context.Location.Granularity = HIGH
Context.Location.Currency = MID
Context.Activity = ALLOW
410
If Request.Group.Person = “Spouse” & Context.Activity = “Shopping” &
Context.Location = “Flower Shop”
Context.Location.Confidence = MID
Context.Location.Granularity = LOW
Context.Location.Currency = MID
Context.Activity = ALLOW
412

FIG. 4

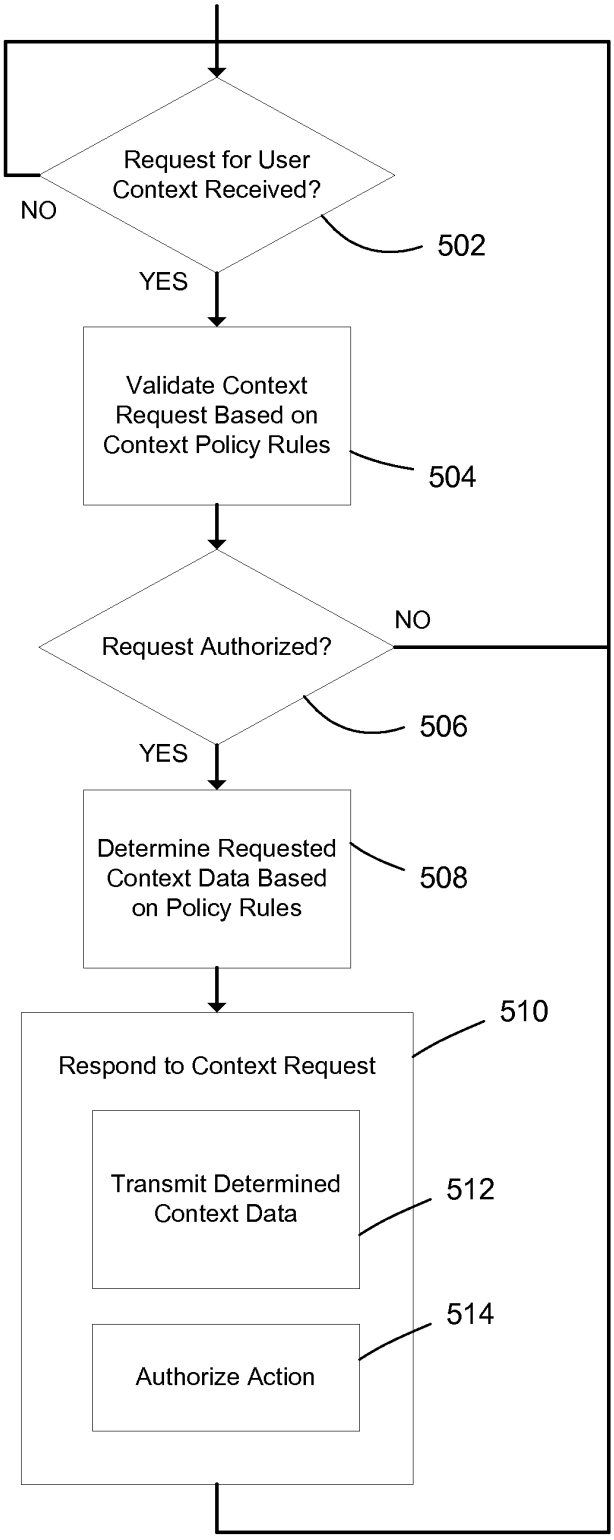

Request for User Context Received?
NO
502
YES
Validate Context Request Based on Context Policy Rules
504
Request Authorized?
NO
506
YES
Determine Requested Context Data Based on Policy Rules
508
510
Respond to Context Request
Transmit Determined Context Data
512
514
Authorize Action

FIG. 5

Electronic Acknowledgement Receipt

EFS ID:	6150350
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett/Cortney Drew
Filer Authorized By:	Glen Madison Kellett
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	25-SEP-2009
Filing Date:	
Time Stamp:	17:04:17
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	ADS.pdf	966812 76b19a9e087d3bc16f01759c351b26291367e4df	no	5
Warnings:					
Information:					

2		UPA.pdf	218276 dbdfce870f39f3e45a353da6f3f6f3ac9a61166e	yes	31

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Miscellaneous Incoming Letter	1	1
Specification	2	19
Claims	20	25
Abstract	26	26
Drawings-only black and white line drawings	27	31

Warnings:	
Information:	
Total Files Size (in bytes):	1185088

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/14 (07-07)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P31880 / 45631-209480
	Application Number	
Title of Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1 Remove

Applicant Authority	◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Tobias	M.	Kohlenberg	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City		State/Province		Country of Residence [i]	

Citizenship under 37 CFR 1.41(b) [i]

Mailing Address of Applicant:

Address 1	
Address 2	

City		State/Province	
Postal Code		Country [i]	

Applicant 2 Remove

Applicant Authority	◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Selim		Aissi	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City		State/Province		Country of Residence [i]	

Citizenship under 37 CFR 1.41(b) [i]

Mailing Address of Applicant:

Address 1	
Address 2	

City		State/Province	
Postal Code		Country [i]	

Applicant 3 Remove

Applicant Authority	◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Dennis	M.	Morgan	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City		State/Province		Country of Residence [i]	

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P31880 / 45631-209480
	Application Number	
Title of Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER	

Citizenship under 37 CFR 1.41(b) i				
Mailing Address of Applicant:				
Address 1				
Address 2				
City		**State/Province**		
Postal Code		**Country**i		

Applicant 4 Remove

Applicant Authority ◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118		
Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**
	Alan	D.	Ross	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service					
City		**State/Province**		**Country of Residence** i	
Citizenship under 37 CFR 1.41(b) i					
Mailing Address of Applicant:					
Address 1					
Address 2					
City		**State/Province**			
Postal Code		**Country**i			

Applicant 5 Remove

Applicant Authority ◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118		
Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**
	Jim	S.	Baca	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service					
City		**State/Province**		**Country of Residence** i	
Citizenship under 37 CFR 1.41(b) i					
Mailing Address of Applicant:					
Address 1					
Address 2					
City		**State/Province**			
Postal Code		**Country**i			

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	73486

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P31880 / 45631-209480
	Application Number	
Title of Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER	

Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER		
Attorney Docket Number	P31880 / 45631-209480	**Small Entity Status Claimed** ☐	
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		**Sub Class (if any)**	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	5	**Suggested Figure for Publication (if any)**	5

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	73486		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P31880 / 45631-209480
	Application Number	
Title of Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER	

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			(•) Yes ( ) No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1 Remove

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:

Address 1			
Address 2			
City		**State/Province**	
Country [i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button. Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/GMK/			Date (YYYY-MM-DD)	2009-09-25
First Name	Glen	Last Name	Kellett	Registration Number	60202

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Petitioner Samsung Ex-1004, 0038

PTO/SB/06 (12-04)

Filing Date: 09/25/09

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 12/567,386

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	330
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	220
TOTAL CLAIMS (37 CFR 1.16(i))	25 minus 20 =	5	x$26		OR	x$52	260
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x$110			x$220	
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $260 ($130 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195			390	
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1350

APPLICATION AS AMENDED – PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDI-TIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDI-TIONAL FEE ($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDI-TIONAL FEE ($)	OR	RATE ($)	ADDI-TIONAL FEE ($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Petitioner Samsung Ex-1004, 0039

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-09)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Zhao, Li
Art Unit	
Examiner Name	
Attorney Docket Number	P31880/45631-209480

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

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Petitioner Samsung Ex-1004, 0040

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Zhao, Li
	Art Unit	
	Examiner Name	
	Attorney Docket Number	P31880/45631-209480

	1	"Location Awareness", retrieved from Wikipedia last modified August 20, 2009 from http://en.wikipedia.org/wiki/Location_awareness; 5 pages.	☐
	2	Forrest, Brady, "iPhone's Location-Aware Apps", July 2008, retrieved from http://radar.oreilly.com/2008/07/iphone-location-aware-apps.html; 2 pages.	☐
	3	Zeman, Eric, "Google's 'Mail Goggles' Set To Be Your E-Mail Wingman -Google Blog", October 7, 2008, retrieved from http://www.iinformationweek.com/blog/main/archives/2008/10/googles_mail_go.html	☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Zhao, Li
	Art Unit	
	Examiner Name	
	Attorney Docket Number	P31880/45631-209480

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Glen M. Kellett/	Date (YYYY-MM-DD)	2009-10-12
Name/Print	Glen Kellett	Registration Number	60,202

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Petitioner Samsung Ex-1004, 0043

Electronic Acknowledgement Receipt

EFS ID:	6245099
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett/Darcy Kobylarczyk
Filer Authorized By:	Glen Madison Kellett
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	12-OCT-2009
Filing Date:	25-SEP-2009
Time Stamp:	16:27:49
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed (SB/08)	P31880_IDS.pdf	610142 b7593590765b58693eaee9fd7f622c42a18bfe3f	no	4
Warnings:					
Information:					

A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

2	NPL Documents	Location_awareness_USE.pdf	397136 2824e77233cdef623226109e0bf909402d3190df	no	5
Warnings:					
Information:					
3	NPL Documents	iPHones_location_aware_apps_USE.pdf	122036 325c89640adc3e91ff2626561eddba317df0781f	no	2
Warnings:					
Information:					
4	NPL Documents	Google_Mail_Goggles_USE.pdf	77601 5a8ef06c09ceaf2a29af3572401a7a5e16aad085	no	1
Warnings:					
Information:					
			Total Files Size (in bytes):	1206915	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480

CONFIRMATION NO. 4223

73486
Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

FORMALITIES LETTER

OC000000038172540

Date Mailed: 10/13/2009

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

- The statutory basic filing fee is missing.
  *Applicant must submit $**330** to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).*
- The oath or declaration is missing.
  A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
  Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The applicant needs to satisfy supplemental fees problems indicated below.

The required item(s) identified below must be timely submitted to avoid abandonment:

- Additional claim fees of $**260** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of $**130** for a non-small entity, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is $**1480** for a non-small entity
- $**330** Statutory basic filing fee.
- $**130** Surcharge.
- The application search fee has not been paid. Applicant must submit $**540** to complete the search fee.

Petitioner Samsung Ex-1004, 0046

- The application examination fee has not been paid. Applicant must submit $**220** to complete the examination fee for a non-small entity.
- Total additional claim fee(s) for this application is $**260**
  - $**260** for **5** total claims over 20.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at http://www.uspto.gov/ebc.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/bnguyen/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Petitioner Samsung Ex-1004, 0047

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/567,386	09/25/2009	2431	0.00	P31880 / 45631-209480	25	3

CONFIRMATION NO. 4223

73486
Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

FILING RECEIPT

OC000000038172539

Date Mailed: 10/13/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Tobias M. Kohlenberg, Residence Not Provided;
Selim Aissi, Residence Not Provided;
Dennis M. Morgan, Residence Not Provided;
Alan D. Ross, Residence Not Provided;
Jim S. Baca, Residence Not Provided;

Power of Attorney: None

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 10/07/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/567,386**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Petitioner Samsung Ex-1004, 0048

Title

METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

Preliminary Class

726

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where the conditions for issuance of a license have been met, regardless of whether or not a license may be required as

Petitioner Samsung Ex-1004, 0049

set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

Petitioner Samsung Ex-1004, 0050

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that my residence, post office address and citizenship are as stated below next to my name; and that I verily believe I am the original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER**, the specification of which was filed on September 25, 2009 as application serial no. 12/567,386.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to the patentability of this application in accordance with 37 C.F.R. § 1.56 (attached hereto). I also acknowledge my duty to disclose all information known to be material to patentability which became available between a filing date of a prior application and the national or PCT international filing date in the event this is a Continuation-In-Part application in accordance with 37 C.F.R. § 1.63(e).

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 120 or 365(c) of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. § 1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

No such claim for priority is being made at this time.

I hereby appoint the following attorney(s) and/or patent agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

Customer Number: 73486

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct CPA GlobalBarnes & Thornburg, LLP to the contrary.

Please direct all correspondence in this case to **CPA Global Barnes & Thornburg, LLP** at the address indicated below:

Customer Number: 73486

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of joint inventor number 1 : **Tobias M. Kohlenberg**
Citizenship: **United States of America** Residence: **Portland, OR**
Post Office Address: 9915 SW 48th Ave.
Portland, OR 97219

Signature: Tobias M. Kohlenberg Date: 11/10/2009
Tobias M. Kohlenberg

Full name of joint inventor number 2 : **Selim Aissi**
Citizenship: **United States of America** Residence: **Beaverton, OR**
Post Office Address: 6870 SW 168th Place
Beaverton, OR 97007

Signature: Selim Aissi Date: 11/12/2009
Selim Aissi

Full name of joint inventor number 3 : **Dennis M Morgan**
Citizenship: **United States of America** Residence: **Pine Grove, CA**
Post Office Address: 13260 Oak Lane
Pine Grove, CA 95665

Signature: _____ Date: 11/10/2009
Dennis M Morgan

Full name of joint inventor number 4 : **Alan D Ross**
Citizenship: **United States of America** Residence: **Shingle Springs, CA**
Post Office Address: 4261 Maverick Road
Shingle Springs, CA 95682

Signature: _____ Date: 11/10/09
Alan D Ross

Full name of joint inventor number 5 : **Jim S. Baca**
Citizenship: **United States of America** Residence: **Corrales, NM**
Post Office Address: 318 Parham Ct.
Corrales, NM 87048

Signature: _____ Date: _____
Jim S. Baca

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information, which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) Prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) The closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecutions of a patent application within the meaning of this section are:

(1) Each inventor named in the application:

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

United States Patent Application

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor I hereby declare that my residence, post office address and citizenship are as stated below next to my name; and that I verily believe I am the original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled: **METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER**, the specification of which was filed on September 25, 2009 as application serial no. 12/567,386.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to the patentability of this application in accordance with 37 C.F.R. § 1.56 (attached hereto). I also acknowledge my duty to disclose all information known to be material to patentability which became available between a filing date of a prior application and the national or PCT international filing date in the event this is a Continuation-In-Part application in accordance with 37 C.F.R. § 1.63(e).

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on the basis of which priority is claimed:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below:

No such claim for priority is being made at this time.

I hereby claim the benefit under 35 U.S.C. § 120 or 365(c) of any United States and PCT international application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. § 1.56(a) which became available between the filing date of the prior application and the national or PCT international filing date of this application:

No such claim for priority is being made at this time.

I hereby appoint the following attorney(s) and/or patent agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith:

Customer Number: 73486

I hereby authorize them to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct CPA GlobalBarnes & Thornburg, LLP to the contrary.

Please direct all correspondence in this case to **CPA Global Barnes & Thornburg, LLP** at the address indicated below:

Customer Number: 73486

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of joint inventor number 1 : **Tobias M. Kohlenberg**
Citizenship: **United States of America** Residence: **Portland, OR**
Post Office Address: 9915 SW 48th Ave.
Portland, OR 97219

Signature: _____ Date: _____
Tobias M. Kohlenberg

Full name of joint inventor number 2 : **Selim Aissi**
Citizenship: **United States of America** Residence: **Beaverton, OR**
Post Office Address: 6870 SW 168th Place
Beaverton, OR 97007

Signature: _____ Date: _____
Selim Aissi

Full name of joint inventor number 3 : **Dennis M Morgan**
Citizenship: **United States of America** Residence: **Pine Grove, CA**
Post Office Address: 13260 Oak Lane
Pine Grove, CA 95665

Signature: _____ Date: _____
Dennis M Morgan

Full name of joint inventor number 4 : **Alan D Ross**
Citizenship: **United States of America** Residence: **Shingle Springs, CA**
Post Office Address: 4261 Maverick Road
Shingle Springs, CA 95682

Signature: _____ Date: _____
Alan D Ross

Full name of joint inventor number 5 : **Jim S. Baca**
Citizenship: **United States of America** Residence: **Corrales, NM**
Post Office Address: 318 Patham Ct
Corrales, NM 87048

Signature: _____ Date: 11/4/2009
Jim S. Baca

§ 1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is canceled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is canceled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information, which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) Prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) The closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecutions of a patent application within the meaning of this section are:

(1) Each inventor named in the application:

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

PTO/SB/14 (07-07)
Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P31880 / 45631-209480
	Application Number	
Title of Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1 Remove

Applicant Authority	◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Tobias	M.	Kohlenberg	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Portland	State/Province	OR	Country of Residence [i]	US

Citizenship under 37 CFR 1.41(b) [i]	US

Mailing Address of Applicant:

Address 1	9915 SW 48th Ave.
Address 2	

City	Portland	State/Province	OR
Postal Code	97219	Country [i]	US

Applicant 2 Remove

Applicant Authority	◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Selim		Aissi	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Beaverton	State/Province	OR	Country of Residence [i]	US

Citizenship under 37 CFR 1.41(b) [i]	US

Mailing Address of Applicant:

Address 1	6870 SW 168th Place
Address 2	

City	Beaverton	State/Province	OR
Postal Code	97007	Country [i]	US

Applicant 3 Remove

Applicant Authority	◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Dennis	M.	Morgan	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Pine Grove	State/Province	CA	Country of Residence [i]	US

PTO/SB/14 (07-07)
Approved for use through 06/30/2010. OMB 0651-0032
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P31880 / 45631-209480
	Application Number	
Title of Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER	

Citizenship under 37 CFR 1.41(b) i	US				
Mailing Address of Applicant:					
Address 1	13260 Oak Lane				
Address 2					
City	Pine Grove	**State/Province**	CA		
Postal Code	95665	**Country**i	US		

Applicant 4 Remove

Applicant Authority ◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118			
Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**	
	Alan	D.	Ross		
Residence Information (Select One) ◉ US Residency	○ Non US Residency	○ Active US Military Service			
City	Shingle Springs	**State/Province**	CA	**Country of Residence** i	US
Citizenship under 37 CFR 1.41(b) i	US				
Mailing Address of Applicant:					
Address 1	4261 Maverick Road				
Address 2					
City	Shingle Springs	**State/Province**	CA		
Postal Code	95682	**Country**i	US		

Applicant 5 Remove

Applicant Authority ◉ Inventor	○ Legal Representative under 35 U.S.C. 117	○ Party of Interest under 35 U.S.C. 118			
Prefix	**Given Name**	**Middle Name**	**Family Name**	**Suffix**	
	Jim	S.	Baca		
Residence Information (Select One) ◉ US Residency	○ Non US Residency	○ Active US Military Service			
City	Corrales	**State/Province**	NM	**Country of Residence** i	US
Citizenship under 37 CFR 1.41(b) i	US				
Mailing Address of Applicant:					
Address 1	318 Parham Ct.				
Address 2					
City	Corrales	**State/Province**	NM		
Postal Code	87048	**Country**i	US		

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	73486

Petitioner Samsung Ex-1004, 0060

PTO/SB/14 (07-07)
Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P31880 / 45631-209480
	Application Number	
Title of Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER	

Email Address	docketing@cpaglobal.com	Add Email	Remove Email

Application Information:

Title of the Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER		
Attorney Docket Number	P31880 / 45631-209480	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	5	Suggested Figure for Publication (if any)	5

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	73486		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

PTO/SB/14 (07-07)
Approved for use through 06/30/2010. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	P31880 / 45631-209480
	Application Number	
Title of Invention	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER	

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

Remove

Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			(•) Yes ( ) No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Assignee 1 Remove

If the Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information:

Address 1			
Address 2			
City		**State/Province**	
Country [i]		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button. Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/GMK/			Date (YYYY-MM-DD)	2009-11-30
First Name	Glen	Last Name	Kellett	Registration Number	60202

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Petitioner Samsung Ex-1004, 0063

Electronic Patent Application Fee Transmittal

Application Number:	12567386
Filing Date:	25-Sep-2009
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Filer:	Glen Madison Kellett/Darcy Kobylarczyk
Attorney Docket Number:	P31880 / 45631-209480

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	330	330
Utility Search Fee	1111	1	540	540
Utility Examination Fee	1311	1	220	220
Pages:				
Claims:				
Claims in excess of 20	1202	5	52	260
Miscellaneous-Filing:				
Late filing fee for oath or declaration	1051	1	130	130

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1480**

Electronic Acknowledgement Receipt	
EFS ID:	6538033
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett/Darcy Kobylarczyk
Filer Authorized By:	Glen Madison Kellett
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	30-NOV-2009
Filing Date:	25-SEP-2009
Time Stamp:	15:08:59
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1480
RAM confirmation Number	5879
Deposit Account	504238
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Oath or Declaration filed	P31880_DEC_11_30_09.pdf	72808 af2e0cdcc97bd9cfceeadec51f9e66635902a068	no	8
Warnings:					
Information:					
2	Application Data Sheet	P31880_ADS_11_30_09.pdf	967686 60a25c29ece4d84d9f309c8c581c05279792af77	no	5
Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	38613 e5ceefa05a8c3f4932765e03c692f4e89b026403	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1079107		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/567,386	09/25/2009	2431	1480	P31880 / 45631-209480	25	3

CONFIRMATION NO. 4223

UPDATED FILING RECEIPT

73486
Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

OC000000039089303

Date Mailed: 12/08/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Tobias M. Kohlenberg, Portland, OR;
Selim Aissi, Beaverton, OR;
Dennis M. Morgan, Pine Grove, CA;
Alan D. Ross, Shingle Springs, CA;
Jim S. Baca, Corrales, NM;

Power of Attorney: The patent practitioners associated with Customer Number 73486

Domestic Priority data as claimed by applicant

Foreign Applications

If Required, Foreign Filing License Granted: 10/07/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/567,386**

Projected Publication Date: 03/31/2011

Non-Publication Request: No

Early Publication Request: No

Petitioner Samsung Ex-1004, 0068

Title

METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

Preliminary Class

726

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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BARNES & THORNBURG LLP
11 South Meridian Street
Indianapolis, Indiana 46204

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	12/567,386
Confirmation No.:	4223
Art Unit:	2431
Examiner:	UNKNOWN
Application Title:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Applicant:	Tobias M. Kohlenberg
Filed:	September 25, 2009
Attorney Docket:	45631-209480

ELECTRONICALLY SUBMITTED ON:

DECEMBER 8, 2009

PRELIMINARY AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Prior to the examination of the above-identified patent application, Applicants request entry of the following:

Amendments to the Specification begin on page 2 of this paper.

Remarks begin on page 3 of this paper.

AMENDMENTS TO THE SPECIFICATION

Under 37 C.F.R. § 1.121(b), please replace paragraph **[0001]** of the BACKGROUND section with the following paragraph:

[0001] Location-aware computing allows computing devices, especially mobile computing devices such as cellular phones and mobile computers, to perform various functions based on the location of the location-aware enabled computing device. Such functions may include, for example, adapting user interfaces, tailoring software applications and/or application data, and publishing data related to or based on the location of the computing device. Additionally, other devices remote from the location-aware enabled computing device may interact with the enabled device to obtain location information and perform remote functions based on such location information such as publishing the location of the user of the device.

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REMARKS

In the specification, paragraph [0001] has been amended to correct a typographical error. No new matter is believed to be entered by this amendment. With the entry of the foregoing amendment, the application is believed to be in condition for examination. Consideration of the claims, leading to their allowance and passage of the application to issuance, is respectfully requested.

Applicants believe that no fees are required with this amendment. If any fees are required, it is respectfully requested that such fees and any overpayment of fees, be charged to the Account of Barnes & Thornburg, Deposit Account No. 10-0435, with reference to our matter 45631-209480.

Respectfully submitted,

BARNES & THORNBURG LLP

/Glen Kellett/

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GMK/crd

INDS02 GKELLETT 1082679v1

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Electronic Acknowledgement Receipt

EFS ID:	6591374
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett/Cortney Drew
Filer Authorized By:	Glen Madison Kellett
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	08-DEC-2009
Filing Date:	25-SEP-2009
Time Stamp:	15:57:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Preliminary Amendment	Prelim_Amend.pdf	122629 789bbd7af00e6dfa3eb95cd04d2305fad73db42e	no	3

Warnings:	
Information:	

Total Files Size (in bytes):	122629

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480

CONFIRMATION NO. 4223

73486
Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

PUBLICATION NOTICE



Title:METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

Publication No.US-2011-0078758-A1
Publication Date:03/31/2011

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

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Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Tobias M. Kohlenberg
Art Unit	2432
Examiner Name	Barron Jr., Gilberto
Attorney Docket Number	P31880/45631-209480

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	2	20020174073	A1	2002-11-21	Nordman et al.	

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	1	2006/106303	WO	A1	2006-10-12	British Telecommunications Public Limited Company		☐
	2	1217857	EP	A2	2001-12-19	Microsoft Corporation		☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron Jr., Gilberto
	Attorney Docket Number	P31880/45631-209480

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron Jr., Gilberto
	Attorney Docket Number	P31880/45631-209480

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Glen M. Kellett/	Date (YYYY-MM-DD)	2011-04-26
Name/Print	Glen M. Kellett	Registration Number	60202

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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European Patent Office
Office européen des brevets

(11) EP 1 217 857 A2

(12) EUROPEAN PATENT APPLICATION

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(54) System and method for context- and location dependent adaptation of applications resident on mobile terminals for use in vehicles

(57) Context-aware systems and methods, location-aware systems and methods, context-aware vehicles and methods of operating the same, and location-aware vehicles and methods of operating the same are described. In various embodiments, a context or location service module, implemented in software, determines a vehicle context or a vehicle location based upon information that it receives from various context providers or location providers respectively. Software executing on a vehicle's computer can then cause one or more applications that are associated with a vehicle computer to be modified in a manner that changes their behavior. The behavior modification is based on the current context or location of the vehicle and thus provides a context-specific or location-specific user experience. The context or location can be ascertained through the use of one or more hierarchical tree structures that comprises individual nodes. Each node is associated with a context or location. The nodes are traversable by the vehicle's software to ascertain a more complete context or location.

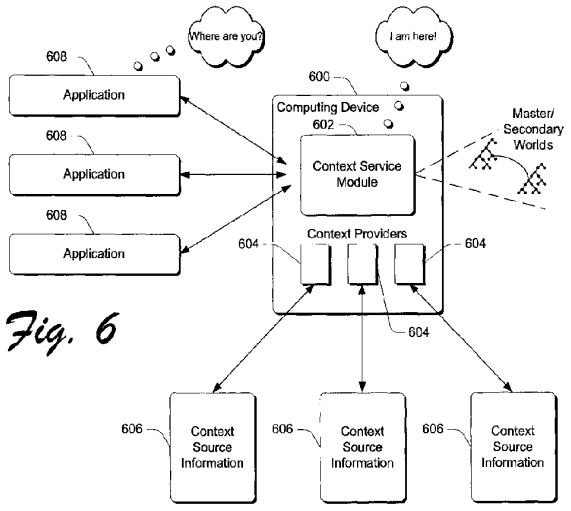


Fig. 6

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Description

TECHNICAL FIELD

[0001] This invention relates to generally to the area of context-aware computing or ubiquitous computing.

BACKGROUND

[0002] The World Wide Web (WWW) was created to make content available from any source in any location around the world. Users of the Web are able to generally access a seemingly infinite number of resources via the Web. The Web has been highly successful in this regard. Yet, with the evolution of the Web, certain needs remain largely unmet. Specifically, people continue to have a need to access information that has a contextual aspect to it. That is, often times, individuals will find themselves in a computing environment that carries with it a certain context. Yet, the context of the environment cannot be easily incorporated into the present computing environment. As an example, consider the context of location. People generally have a need to access information, data, resources and the like, that have geographic dimensions to them. For example, individuals may desire to take advantage of services or products that are close in proximity to where they currently are located. In this regard, it is desirable to understand the individual's contextual location so that services, goods and the like can be made available to the individual. As "e-Commerce" continues to grow in importance, the necessity of bringing people, places, services and goods together in an efficient manner will become critically important.

[0003] To date, many attempts have been made to bring people, places, services and goods together. These various attempts have generally approached the problem from different directions in an often times incompatible manner. As an example, consider the context of location. Some services have attempted to bring people and services together by defining large databases that maintain information about the services. For example, a list of restaurants may be maintained in a web accessible database where each restaurant is associated with a zip code in which the restaurant is located. When a user desires to locate a particular restaurant, they might simply enter the zip code where they are located to see a list of corresponding restaurants in that zip code. From the list of restaurants, they might be able to select one or two restaurants of interest. This approach is undesirable for a number of reasons. First, the operation of the system is dependent upon a central server that is responsible for receiving user queries and executing the queries to return the information to the user. In the event the server fails, so too does the service. In addition, this particular service might be suited to finding restaurants, but possibly not other businesses. In addition, the granularity with which the results are returned to the user may foist some of the search burden on the user (i.e. the user gets a list of restaurants in a nearby zip code, but has to further explore the list to select which ones are of interest). Further, the list of restaurants may include some restaurants that are blocked by some type of a physical barrier (i.e. a river, mountain, etc.) that makes the distance, as the crow flies, unroutable.

[0004] Providers of services and products want to be connected to nearby end-users. End-users want to consume these services and goods at the closest and most convenient location. Acquiring the services of a dentist or a plumber that lives somewhere "out on the net" is not appropriate if you need them to fill a cavity or unclog a sink. Looking for the nearest hotdog while in a stadium requires you to stay in the stadium.

[0005] There is an unsolved need to be able to create context-aware computing in which computing devices can participate in their particular context. In specific circumstances, there are needs to provide relational position awareness among physical locations in both public and private views of the world. To date, however, there is no one standardized view of the world that would unlock the potential of context-aware computing. Context-aware computing is much more than just position awareness—although this is a very big field in and of itself.

[0006] This invention arose out of concerns associated with developing a standardized, context-aware infrastructure and related systems to unlock the potential of context-aware computing.

SUMMARY

[0007] Context-aware systems and methods, location-aware systems and methods, context-aware vehicles and methods of operating the same, and location-aware vehicles and methods of operating the same are described. In various embodiments, a context or location service module, implemented in software, determines a vehicle context or a vehicle location based upon information that it receives from various context providers or location providers respectively. Software executing on a vehicle's computer can then cause one or more applications that are associated with a vehicle computer to be modified in a manner that changes their behavior. The behavior modification is based on the current context or location of the vehicle and thus provides a context-specific or location-specific user experience. The context or location can be ascertained through the use of one or more hierarchical tree structures that comprises individual nodes. Each node is associated with a context or location. The nodes are traversable by the vehicle's software

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to ascertain a more complete context or location.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008]

Fig. 1 is a diagram of an exemplary computing device that can be used in accordance with the described embodiments.
Fig. 2 is a conceptual diagram of an exemplary Master World and an exemplary Secondary World in accordance with the described embodiment.
Fig. 3 is an exemplary specific view of a Master World and a Secondary World and their relation to one another.
Fig. 4 is a flow diagram that describes steps in a method in accordance with the described embodiment.
Fig. 5 is a flow diagram that describes steps in a method in accordance with the described embodiment.
Fig. 6 is a high level diagram of an exemplary computing device architecture.
Fig. 7 is a somewhat more specific view of an exemplary computing device architecture.
Fig. 8 is a flow diagram that describes steps in a method in accordance with the described embodiment.
Fig. 9 is a flow diagram that describes steps in a method in accordance with the described embodiment.
Fig. 10 is a flow diagram that describes steps in a method in accordance with the described embodiment.
Fig. 11 is a side elevational view of an exemplary location beacon in accordance with one embodiment.
Fig. 12 is a diagram of a vehicle computer in accordance with one described embodiment.
Fig. 13 is a more detailed view of portions of the Fig. 12 vehicle computer.
Fig. 14 is a block diagram of an exemplary context-aware system in accordance with one described embodiment.
Fig. 15 is a flow diagram that describes steps in a method in accordance with one described embodiment.
Fig. 16 is a block diagram of an exemplary location-aware system in accordance with one described embodiment.
Fig. 17 is a flow diagram that describes steps in a method in accordance with one described embodiment.
Fig. 18 is a flow diagram that describes steps in a method in accordance with one described embodiment.
Fig. 19 is a flow diagram that describes steps in a method in accordance with one described embodiment.
Fig. 20 is a flow diagram that describes steps in a method in accordance with one described embodiment.
Fig. 21 is a flow diagram that describes steps in a method in accordance with one described embodiment.
Fig. 22 is a diagram of an exemplary system in accordance with one described embodiment.

DETAILED DESCRIPTION

Overview

[0009] To provide a standardized solution, embodiments described just below provide a uniform definition of the world. The uniform definition is defined in terms of a hierarchical tree of nodes, where each node represents some aspect of the world. Each node is connected to at least one other node by a branch. An exemplary classification of nodes takes place on a physical level (e.g. physical locations such as political entities, infrastructure entities and public places), as well as a non-physical level (e.g. military APOs). This hierarchical nodal structure is referred to as the Master World, and is a standardized view worldwide. Each node of the Master World has various attributes associated with it that assist in context-aware computing. Exemplary attributes include a unique ID, name, geographic entity class, latitude/longitude, relative importance, contextual parents to name just a few. The Master World is useful because it can be used to determine the relative location of a place anywhere in the world and at any definable granularity.

[0010] Once an individual's location or a place an individual is interested in is determined, various services that reference the location can be offered to the individual based on their location. That is, value is provided by the Master World model in the ability to tie services to nodal locations in the Master World.

[0011] Building on this concept, two additional concepts add value—the concept of so-called Secondary Worlds and a "geozone."

[0012] A Secondary World is a powerful computing mechanism whereby individual entities (such as businesses or organizations) can define their own particular worlds that need not necessarily conform to the Master World view of the world. That is, while the Master World is essentially a physical hierarchical representation of the world, the Secondary Worlds can be physical and/or logical representations of each individual entities' world view. One particularly useful aspect of the Secondary World is that it links, at at least one point, into the Master World. Thus, within any Secondary World, a user's location not only within the Secondary World, but the Master World as well can be determined. Various services can be attached to the nodes of the Secondary World. Based upon a user's calculated position, these various services that are associated with Secondary World nodes can be offered to the user. In addition, because the user's context is determined relative to the Master World, other services that may not be associated with a particular

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Secondary World can be offered.

[0013] A geozone is essentially a spatial indexing mechanism by which the Master World is subdivided into individual zones. In the described embodiment, the zones are subdivided through the use of a quadtree algorithm that is dependent on a density function (although many other spatial index approaches can also be used). Once a desired density level is achieved (density might be defined in terms of points of interest per zone), each node on the Master World is assigned a particular geozone. Geozones enable proximity calculations to be computed in a fast and straight forward manner.

[0014] A useful aspect of the Master and Secondary Worlds are that they are "reachable" from various computing devices such as stationary (i.e. desktop devices) or mobile computing devices (i.e. cell phones, laptops etc.). That is, the Master World (or at least a portion of it) and one or more Secondary Worlds can be either locally maintained on the computing device, or accessed, e.g. via the Web or some other mechanism, so that a user can derive their context. For example, the Secondary World can be downloaded onto the computing device so that a user can derive their context within the Secondary World. Once a user's context is determined from the Master World and one or more Secondary Worlds, a various robust collection of context-aware solutions become available to the user. For example, specific Secondary World services can be offered or Master World services can be offered. Additionally, services from other Secondary Worlds might also be offered since the user's location may be known (or made known) to these other Secondary Worlds. In this way, the Master World can link two or more Secondary Worlds together.

[0015] Another aspect is that the described embodiments harness the computing power of each computing device in determining the device's location. Here, by virtue of having the Master World and one or more Secondary Worlds reachable by the device (and possibly locally maintained on the device), the device itself determines its own context.

[0016] One embodiment provides a client side device that is configured to utilize the context-aware structures that are discussed above, i.e. the Master and one or more Secondary Worlds. The Master World or a portion thereof can be locally available on the device or can be accessible at another location, e.g. via the Web. In this embodiment, the client device has a location service embodied thereon. The described location service is a software module that can determine the location of the device and can answer queries from various applications (either executing on the device or off the device). The location service determines the location of the device by using the Master World and one or more Secondary Worlds. The applications query the location service through one or more Application Program Interfaces (APIs) or Events to get location information that is used by the applications to render a service.

[0017] The location service makes use of one or more location providers that convey information to the device. This information can be information that is specific to the location provider, or can be information that can be mapped directly into a node of the Master World or Secondary Worlds. Exemplary location providers can include Global Positioning Service (GPS) providers, cell phone providers (cell providers), Bluetooth providers, a user interface provider and the like. The location providers provide information that gives some aspect of a device's current location. This information is used by the location service to ascertain the location of the device.

[0018] One particularly advantageous feature of the client device is a standard or common location provider interface. The location provider interface enables the various location providers to provide information to the location service so that the location service can use the information to determine its location. Essentially, the multiple location provider interface is a common interface that enables multiple different location providers to provide location information (or hints) about location to a location service that is on a device. The location providers can provide the location information constantly, at intervals, or when polled by the device. The location information can be provided with confidence and accuracy estimates to enable the location service to evaluate the relative quality of the information before it is used. The various providers also have the ability to self-monitor themselves which assists in the providers' ability to intelligently convey information to the location service. By having a common interface, the collection of location providers is dynamically extensible—that is location providers can be added or removed from the collection of location providers without any interference of the functionality performed by the location service or device. The location providers can be added or removed while the device is operating. This is particularly useful in accommodating location providers that are developed in the future. In this particular embodiment, two levels of abstraction are provided i.e.

(1) the provider interface that receives information from the location providers and
(2) the API/events layer that enables applications to get at the various information.

[0019] One focus of this embodiment is a device that can collect context information (e.g. location information) from a variety of different sources, determine the device's current context from that information, and provide the current context at some level to one or more applications that can use the device's context to render a service or enable the device to participate in its context environment.

[0020] In the described embodiment, the device receives location information or hints about its location. This information is collated and mapped by the location service into a node in the Master World and/or Secondary World. The hierarchical trees can then be traversed to determine the device's accurate location in both the Secondary World and

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the Master World. At this point, the device has determined its context. The information that is collected can be subject to arbitration to ensure that only highly trusted information is used to determine context. The location information can be cached to provide "current location information" which, for a definable period of time will be accurate to some degree. Thus, if for some reason other location providers are unavailable, the cache can be used to ascertain location.

[0021] Once a device's location is determined, the device can apply a security policy to the information. Once this is done, the device can begin to answer queries from various applications.

[0022] One aspect of the described embodiment is a "favorite locations" aspect in which the device can be automatically configured, when it determines its context, so that it can adjust to the different locations.

[0023] Further, various types of location providers can convey different types of information. For example, a so-called "thin provider" provides location information that is translated by the location service into the appropriate node information. A so-called "thick provider" includes logic that takes location information and provides it in a form that can map directly into the Master World or Secondary World.

[0024] In another embodiment location translation services are provided that are directed to determining, as accurately as possible, the context or location of the device. In this embodiment, information is received from the various location providers. This information includes location, accuracy and confidence (all of which are provided by the location provider), trust (which is assigned to a location provider by the device or a user) and a timestamp (which helps to age the location information). The location translation processing involves determining which of the location providers are valid and active. The location providers can be ranked in accordance with the confidence and trust levels. This defines an ordered list of location providers. Provision is made for a situation in which all of the location providers may go inactive. If so, a "current location" is used as a location provider whose confidence decreases over time.

[0025] In the event that information from two or more of the location providers conflicts, then measures can be taken to use information for which there is a higher level of trust. The information that is provided by all of the location providers (assuming no conflict) can then be used to determine a tree structure and a node's entity ID (EID). The tree might be the Master World and the EID is a node on the Master World. The tree might also be a Secondary World and the EID (or location unique indentifier or "LUID") is a node on the Secondary World. Once this information is collected, complete location information can be determined by simply traversing the tree(s). Once a device's location is determined, a cache can be updated with the current location (including a time stamp).

[0026] In another embodiment, privacy issues in the context-aware computing environment are addressed. In this embodiment, the location service has acquired location information that pertains to the location of a particular device. A privacy manager determines what level of information to provide to applications that might request the information. The privacy manager can reside on the computing device itself, or can be proxied by a trusted third party.

[0027] According to this embodiment, a scale of privacy levels are defined. Each level is defined to include more or less specific information about the location of a particular device. A user is able to assign a privacy level to entities that might request location information. Additionally, each node of the Master World and a Secondary World can have a privacy level associated with it. When a query from an application is received, the privacy manager first determines who the query is from and the privacy level associated with the application or entity. The privacy manager then evaluates one or more of the Master World and the Secondary World to find a node that has a corresponding privacy level. When a corresponding node is found, information at that particular granularity is provided to the requesting application or entity.

[0028] In another embodiment systems and methods of providing a location provider in the form of a location beacon are described. In this embodiment, a location beacon is provided that can be mounted in various areas (public/private areas) to beacon the location to any computing devices within transmission range. The information that is transmitted enables a device to determine its location or context. The location beacon can transmit information that is specific to the location service that uses the information. Transmitted information can include an EID/URL pair, and a LUID/URL pair. The EID gives the node identification of a node in the Master World; and, the associated URL gives a protocol to communicate with the Master World. The URL might, for instance, link to a server that can provide additional context information that uses the EID. The LUID indicates a node on a Secondary World that corresponds to a current location; and the URL gives a protocol to communicate with the Secondary World. For example, the URL can link with a server that is hosting the Secondary World. This server can then be queried to discover more information about the Secondary World (i.e. Secondary World tree structure, location of associated resources, etc.) With the BID and LUID (along with the URLs), a device can now traverse the Master World or Secondary World to determine its location. Various technologies can be used to implement the beacon (wireless, RF, IR). The beacon can be a "program once" device to deter tampering. Programmable beacons can, however, be provided. Security can also be provided in the form of a verifiable signature that is provided with the beacon information to assure the veracity of the transmitted information.

[0029] A useful context-aware computing aspect of the beacon is the concept of "location-enabled access". That is, in addition to (or separately from) receiving location information, a beacon can transmit code download pointers that enable smart devices to access software code that allows the device to participate in its current context.

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Exemplary Computing System

[0030] In the context of this document, the term "computing device" is used to refer generally to any type of computing device. Characteristics of exemplary computing devices are that they typically include one or more processors, computer-readable media (such as storage devices and memory), and software executing on the one or more processors that cause the processors to implement a programmed functionality. In particular embodiments, implementation takes place in the context of mobile computing devices (e.g. laptop computers and the like), and/or hand-held computing devices (e.g. palm PCs, wireless telephones and the like).

[0031] Fig. 1 is a schematic diagram that constitutes but one example of a computing device that is suitable for use in connection with the described embodiments. It is to be understood that portions of the illustrated computing device can be incorporated in one or more of the computing devices (e.g. palm PCs, wireless telephones, etc.) with which particular embodiments are envisioned for use.

[0032] Computer 130 includes one or more processors or processing units 132, a system memory 134, and a bus 136 that couples various system components including the system memory 134 to processors 132. The bus 136 represents one or more of any of several types of bus structures, including a memory bus or memory controller, a peripheral bus, an accelerated graphics port, and a processor or local bus using any of a variety of bus architectures. The system memory 134 includes read only memory (ROM) 138 and random access memory (RAM) 140. A basic input/output system (BIOS) 142, containing the basic routines that help to transfer information between elements within computer 130, such as during start-up, is stored in ROM 138.

[0033] Computer 130 further includes a hard disk drive 144 for reading from and writing to a hard disk (not shown), a magnetic disk drive 146 for reading from and writing to a removable magnetic disk 148, and an optical disk drive 150 for reading from or writing to a removable optical disk 152 such as a CD ROM or other optical media. The hard disk drive 144, magnetic disk drive 146, and optical disk drive 150 are connected to the bus 136 by an SCSI interface 154 or some other appropriate interface. The drives and their associated computer-readable media provide nonvolatile storage of computer-readable instructions, data structures, program modules and other data for computer 130. Although the exemplary environment described herein employs a hard disk, a removable magnetic disk 148 and a removable optical disk 152, it should be appreciated by those skilled in the art that other types of computer-readable media which can store data that is accessible by a computer, such as magnetic cassettes, flash memory cards, digital video disks, random access memories (RAMs), read only memories (ROMs), and the like, may also be used in the exemplary operating environment.

[0034] A number of program modules may be stored on the hard disk 144, magnetic disk 148, optical disk 152, ROM 138, or RAM 140, including an operating system 158, one or more application programs 160, other program modules 162, and program data 164. A user may enter commands and information into computer 130 through input devices such as a keyboard 166 and a pointing device 168. Other input devices (not shown) may include a microphone, joystick, game pad, satellite dish, scanner, or the like. These and other input devices are connected to the processing unit 132 through an interface 170 that is coupled to the bus 136. A monitor 172 or other type of display device is also connected to the bus 136 via an interface, such as a video adapter 174. In addition to the monitor, personal computers typically include other peripheral output devices (not shown) such as speakers and printers.

[0035] Computer 130 commonly operates in a networked environment using logical connections to one or more remote computers, such as a remote computer 176. The remote computer 176 may be another personal computer, a server, a router, a network PC, a peer device or other common network node, and typically includes many or all of the elements described above relative to computer 130, although only a memory storage device 178 has been illustrated in Fig. 1. The logical connections depicted in Fig. 1 include a local area network (LAN) 180 and a wide area network (WAN) 182. Such networking environments are commonplace in offices, enterprise-wide computer networks, intranets, and the Internet.

[0036] When used in a LAN networking environment, computer 130 is connected to the local network 180 through a network interface or adapter 184. When used in a WAN networking environment, computer 130 typically includes a modem 186 or other means for establishing communications over the wide area network 182, such as the Internet. The modem 186, which may be internal or external, is connected to the bus 136 via a serial port interface 156. In a networked environment, program modules depicted relative to the personal computer 130, or portions thereof, may be stored in the remote memory storage device. It will be appreciated that the network connections shown are exemplary and other means of establishing a communications link between the computers may be used.

[0037] Generally, the data processors of computer 130 are programmed by means of instructions stored at different times in the various computer-readable storage media of the computer. Programs and operating systems are typically distributed, for example, on floppy disks or CD-ROMs. From there, they are installed or loaded into the secondary memory of a computer. At execution, they are loaded at least partially into the computer's primary electronic memory. The invention described herein includes these and other various types of computer-readable storage media when such media contain instructions or programs for implementing the steps described below in conjunction with a microproc-

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essor or other data processor. The invention also includes the computer itself when programmed according to the methods and techniques described below.

[0038] For purposes of illustration, programs and other executable program components such as the operating system are illustrated herein as discrete blocks, although it is recognized that such programs and components reside at various times in different storage components of the computer, and are executed by the data processor(s) of the computer.

Defining the World

[0039] One of the problems to date with attempting to solve the context-aware computing problem is that every proposed solution has its own approach, data structures, processes and the like. There is little if any standardization between the various approaches. In the described embodiment, standardization is achieved at the foundational level by defining a universal view of the Earth. That is, a universally acceptable definition of the Earth is proposed and is useable in various computing scenarios to enable context-dependent computing. In this document, a specific example of context-dependent computing is given in the form of location dependent computing. It is to be understood that this constitutes but one example of a context in which the various embodiments discussed below can be employed. Other "contexts" can include, any information that can fit into a hierarchical structure including, without limitation, role/personnel in an organization, device categorizations, current activity, current environment, active devices and the like.

The Master World

[0040] A Master World is defined as a politically correct and publicly accepted hierarchical tree structure that catalogs physical location or geographic divisions of the Earth. The Master World is defined in such a way that many different classes of political, administrative and geographic entities across the entire Earth are included. Areas of political contention are accounted for by presenting a view of the world based on the language/locale of the computing device.

[0041] Fig. 2 shows an exemplary hierarchical tree structure 200 that represents a portion of the Master World. The Master World contains multiple nodes 202, with each node representing some type of geographic division (e.g. political or natural entity) of the Earth. In the illustrated example, the nodes of the Master World are arranged in the following groups: (1) political or natural entities (e.g. continents, countries, oceans, states, counties, cities and the like); (2) infrastructure entities (e.g. postal codes, area codes, time zones and the like); (3) public place entities (e.g. parks, malls, airports, stadiums, and the like); and (4) non-physical entities (military postal code regions, vacation regions, affiliate coverage areas of television networks that can be geographically discontinuous, and the like).

[0042] In the Fig. 2 example, the top node of the tree structure represents the Earth. Each node underneath the top node represents a geographical division of the Earth. In this example, none of the nodes have an association with any businesses or services. That is, there is a distinction between node entities that are part of the Master World and non-geographic places where activities take place. Though the Master World includes nodes for public places (i.e. airports, malls, etc), it does not include individual listings of businesses or service providers. Each node is uniquely identified by an ID (EID or entity ID). In addition to the unique EIDs, a URL is associated with the tree structure and provides a context for the tree structure as will become apparent below.

[0043] As an example, consider the following: Seattle-Tacoma International Airport (SeaTac) will be included in the Master World, but references to individual airline business locations at SeaTac might be "leaves" on the tree that are tagged by the SeaTac Airport EID (see "Secondary World" section and the Table below). Similarly, the Seattle Center might be a node on the Master World, while the Seattle Arts Festival, Bumpershoot, the Seattle Sonics NBA Team, and the Seattle Center Starbucks Coffee Shop might be tagged with the Seattle Center EID. As another example, the Master World also contains nodes for all Interstate (motorway) exits. For example, the I-90, Exit 109, Washington is a node in the Master World. The Best Western Inn located at 1700 Canyon Road in Ellensburg, Washington might be tagged with the EID of this Exit.

[0044] Thus, the Master World provides a uniform way of defining locations. The uniform location definitions can then be universally used to assign attributes to goods or services. Whenever a computing device determines its location to correspond to a particular uniform location definition, it can take advantage of the location-dependent goods or services that share the uniform location definition. The Master World is useful because it is a standardized view of the world. Its accurate standardized geographic dimension attribution can be easily accessed by both providers and consumers. Services and product providers (or third parties such as search engines, network and yellow-page database directories) can use the nodes of the Master World by assigning a standardized persistent geographic reference to all commerce locations or points of interest. These commerce locations or points of interest can be considered as "leaves" on the tree structure.

[0045] In the illustrated example, the nodes of the Master World have one or more attributes that facilitate its use. Exemplary attributes are described in the table immediately below:

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Attribute	Description
Entity ID (EID)	The EID is a unique ID for each node. No two nodes have the same EID.
Name	The name is defined in terms of the neutral ground truth (NGT) name. The NGT name supports various language translations for entity names as appropriate (e.g. Pacific Ocean, Pazifischer Ozean, Oceano Pacifico, etc.)
Geographical Entity Class (GEC)	The GEC is a geographical classification of each node. An exemplary GEC is discussed below in the "Geozone" section.
Latitude	The horizontal coordinate position on the globe (i.e. the coordinate position of the node's centroid)
Longitude	The vertical coordinate position on the globe (i.e. the coordinate position of the node's centroid)
Relative Importance	The geographic importance of an entity in reference to other entities in the same region. Value from 1 to 256 (e.g. New York City = 3, Los Angeles = 4, and Omaha = 5 even though Omaha is much smaller but almost as important in relation to surrounding populated places)
Contextual Parent(s)	The parents of the parent/child relationship for each node. Multiple parents are supported (e.g. Redmond is a child of King County, Area Code 425, the Pacific Time Zone, and the MSNBC affiliate KING TV).
Source	The source of origin for the record (e.g. Microsoft or a specified data vendor)
Start Date	Date when the node information was first valid
End Date	Date when the node information was last valid (retired zip codes, breakup of countries)
Modification Date	Records date changes that are made tot eh record relating to retirement or updates to any fields
Status	Active, lashed (links duplicate nodes together), pending or retired

[0046] The attributes listed above constitute exemplary attributes only. Other attributes that are different from and/or additional to those referenced above could be used. A few exemplary entity or node records that employ the above attributes are shown below:

Entity ID (EID)	24948
Name	Pacific Ocean, Pazifischer Ozean, Oceano Pacifico, etc.
Geographical Entity Class (GEC)	138/Ocean
Latitude	0 (+000° 00'00")
Longitude	-170 (-170° 00'00")
Relative Importance	1
Contextual Parent(s)	World
Source	MSFT GeoUnit
Start Date	0/0/00
End Date	0/0/00
Modification Date	01/18/00
Status	Active

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Entity ID (EID)	27490
Name	Redmond
Geographical Entity Class (GEC)	78/non-capital town
Latitude	47.6768303 (+047° 40' 36")
Longitude	-122.1099625 (-122° 06' 35")
Relative Importance	107
Contextual Parent(s)	1. King, second level [Washington, United States] 2. Puget Sound-Seattle, travel region [Washington, United States]
Source	MSFT GeoUnit
Start Date	0/0/00
End Date	0/0/00
Modification Date	01/18/00
Status	Active

[0047] The Master World also serves as a repository of common denominator links between itself and various "Secondary Worlds" and as a conduit that connects Secondary Worlds to other Secondary Worlds. Content, service and device providers can use the Master World to associate their publicly available offerings with a geographic location and the corresponding multiple branch hierarchical structure. This location will be associated with a single entity within the tree structure thereby allowing geographic and time/distance calculations and the necessary parent/child relationship navigation.

The Master World Index (Geozones)

[0048] By definition, the Master World provides a hierarchical structure of entities (nodes) that cover the entire globe. Upward navigation within the hierarchy is quite natural. Efficient navigation downward requires geographic proximity awareness. Additionally, there are possible scenarios that will require jumping from branch to branch in order to successfully return values in a query, or for more accurate calculations of distances to close "leaves" attached to nodes other than the original source node. The Master World makes use of an index scheme that can identify peer level nodes by virtue of the geographical proximity. This indexing scheme makes use of a quad tree algorithm to define so-called "geozones."

[0049] A quadtree is essentially a spatial index that breaks coverage into homogeneous cells of regularly decreasing size. Each quadrant of the tree has up to four children. The quadtree segmentation process can continue until the entire map is partitioned based on many different end result criteria including the density of the number of items (e.g. points of interest) in each quad. The approach provides a form of spatial index that accelerates spatial selection and content identification.

[0050] To complete the spatial indexing scheme to provide each node with a defined geozone, a quadtree algorithm is applied to the nodes and can be based upon a desired density of, for example, points of interest that are to occur in any one zone. Once all of the zones have been defined, each zone is given a unique ID (e.g. top/left and bottom/right Latitude and Longitude pairs). Each of the nodes of the Master World is then assigned a zone in which it is located. Quadtree algorithms are known and will be appreciated by those of skill in the art.

The Master World Location

[0051] As can be appreciated, having a uniform standardized representation of the world in the form of a hierarchical traversable tree structure can greatly facilitate the manner to which context-dependent, and more specifically, location-dependent goods and services can be linked.

[0052] In the described embodiment, a computing device has access to at least a portion of the Master World. For

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example, the computing device can have the Master World saved in an internal storage device, it can comprise part of the computing device's operating system, or the device might access the Master World via a network medium such as the Internet. With the Master World tree structure being accessible to each computing device, each device has the power to determine its own context or node-referenced location. That is, the computing device can determine, through software it is executing, its particular location, i.e. node. Once the computing device determines an associated node, it can simply traverse the tree to ascertain its complete location.

[0053] For example, if a computing device determines that it is currently located at a node that corresponds to the City of Redmond, it can traverse the Master World tree structure to ascertain that it is in the State of Washington, Country of The United States, on the continent of North America. By ascertaining its precise location, the computing device (or its user) is now in a position to take advantage of location-dependent services that might be offered. This particular model is a tremendous improvement over current models that utilize a central server to ascertain location for a number of different devices. In that model, each device (or user) provides information about its location (e.g. perhaps the user enters the zip code or city that the device is currently in) and might enter a query to find, for example, a McDonald's restaurant in his zip code. The server then takes this information and might, for example, tell the user about the location of all of the McDonald's restaurants within that zip code or city. If the servers fails in this model, then none of the computing devices can take advantage of its services. In the present model, each computing device is self-sustaining. Each can determine its own location, and accordingly, each device can take advantage of location-dependent services. For example, if the computing device understands that it is located on a particular node of the Master World, then it can execute queries to find a McDonald's that has an BID that corresponds to the particular node in which the computing device is located. Particular robustness is provided through the use of the above-described geo-zones. The geo-zones enable proximate geographic divisions to be quickly searched in an efficient manner. For example, if an individual is looking for the nearest Kinko's to make copies and none are located in the geo-zone that corresponds to the node in which the computing device is located, then adjacent geo-zones can be quickly searched.

Secondary Worlds

[0054] In the described embodiment, the concept of a Secondary World is used to provide support for additional context. A secondary world might be defined by a third party organization or company and contains nodes that comprise physical and/or logical entities that are unique to that organization. The nodes of the Secondary World may or may not have much context outside of the particular organization that defined the Secondary World, since a secondary world could be made either public or private. The Secondary Worlds do not duplicate the Master World, but rather supplement it in a unique, organization specific manner. While the Master World is defined to be a widely accepted standard, each Secondary World can be a widely variant representation of an organization's proprietary view of the world. In the described embodiment, each Secondary World has at least one node that is linked with a node of the Master World. This gives the Secondary World a context or location in the Master World. Also note that in some context applications, several secondary worlds may be accessed, each providing additional context specific pieces of location data.

[0055] Fig. 2 shows an exemplary Secondary World 204 that comprises a plurality of nodes 206. Each of the nodes 206 constitutes a physical or logical entity. For example, the nodes can constitute a company, its divisions, regions campuses, buildings, floors in various buildings and rooms on various floors. At least one of the nodes is linked with a node of the Master World. The nodes of the Secondary World can have the same attributes as the nodes of the Master World.

[0056] As an example of a Secondary World, consider that Boeing might define a Secondary World that includes a list of entities that are important to its employees. The root entity would be "Boeing Corp." and its children might be company divisions (St. Louis Military Division, Everett Plant, Corporate HQ, etc.). Further down the tree structure, individual nodes might be defined to represent individual buildings (Hanger 12), offices within this building (Office 1001), building areas (Southwestern quadrant of hanger 12), etc. Each entity or node has a unique identifier (Local Unique ID or "LUID") and a URL that is associated with the tree on which the node occurs. The URL uniquely identifies the Secondary World tree structure so that a user within that world can determine how to interact with the world. This aspect is discussed below in more detail. Boeing can then use the LUIDs to associate equipment, services, departments or even personnel to a physical or logical location.

[0057] As a more concrete example, consider Fig. 3 which shows an exemplary portion of the Master World 300 and a Secondary World 302. Master World 300 includes the following nodes: World, United States, Washington, Redmond, and Zip = 98052. The exemplary Secondary World 302 is a hierarchical tree structure that has been defined by Microsoft Corporation and includes the following nodes: Microsoft, Redmond Campus, 1 Microsoft Way, Building 26, 3rd floor, Conference Room 3173, Building 24, 2nd floor, Conference Room 1342. In this example, the Secondary World 302 "touch points" into the Master World from the Redmond node. In this example, a video projector is shown as being associated with the node "Conference room 1342". Here, the video projector is not a node in the secondary world. Rather, the video projector is an item in some other resource discovery service (e.g. the active directory) and includes

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a location attribute that is a pointer to "Conference room 1342." There may be times, however, when nodes can be created in the worlds to represent the location of key services—the node themselves, however, would not represent the services.

[0058] Like the Master World, the Secondary World is advantageously accessible to a user's computing device. It could, for example, be downloaded—completely or partially--and stored on a storage device and accessed when needed. It might be downloaded for a one time use only. The Secondary World enables the computing device to ascertain its context within the Secondary World. In this example, the computing device would, by using the Secondary World, compute its location within the Secondary World. The computing device can do this by traversing the tree structure from the node in which it is currently located to the root node. This would, for example, give the computing device (and hence the user) a complete Secondary World context. Once the Secondary World location is known, the user is in a position to take advantage of goods or services that are associated with the nodes of the Secondary World. That is, once the computing device determines its Secondary World context, it is ready to become an active participant in the Secondary World.

[0059] Tremendous value can be achieved by associating goods or services with the individual nodes of the Secondary World. For example, Conference Room 1342 has a video projector associated with it. That is, the location of the video projector is in Conference Room 1342. Assume that an individual in Conference Room 3173 has a presentation that requires the use of the video projector such as the one located in Conference Room 1342. Normally, an individual would have no way of ascertaining the location of the video projector other than perhaps physically calling over to the building to check whether there is a video projector available. In this example, because the user's computing device is able to ascertain its location within the Secondary World, it is able to locate the video projector in Conference Room 1342. It would do this by simply executing software that traverses the Secondary World tree structure to find the resource of interest.

[0060] Note also that because there is a link into the Master World, the computing device is able to derive it context (location) within both worlds. This enables the computing device, and hence the user, to take advantage of goods and services that are associated with the Secondary World, as well as participate in location-dependent services that are consumable based upon the user's location in the Master World.

[0061] Fig. 4 is a flow diagram that describes steps in a method in accordance with the described embodiment. The steps described just below are implemented by a computing device which, in the illustrated example, is a hand-held mobile computing device.

[0062] Step 400 accesses first and second hierarchical tree structures that are resident on a computer-readable media. In this example, the tree structures might be stored on the device or might be accessible via a network such as the Internet. An exemplary first tree structure is the Master World and an exemplary second tree structure is a Secondary World. Alternately, the tree structures could both be Secondary Worlds. Once the tree structures have been accessed by the device, step 402 traverses multiple nodes of the tree structures to derive the context of the computing device. In this example, the computing device receives information that informs it as to its location at a node of one of the trees. This information can come to the computing device in any suitable way, e.g. a user can enter the information through a User Interface (UI) or the location might be broadcast to the computing device by another computing device (e.g. through the use of Bluetooth technology or Universal Plug and Play (UpnP). Specific examples of how this information can be conveyed to the computing device are given below in more detail. Regardless of how this information is conveyed to the computing device, once the computing device has the information, it executes software that traverses one or both of the tree structures to derive its context which, in this example, is the device's location.

Defining Secondary Worlds

[0063] As was mentioned above, one particularly valuable aspect of the described embodiment is that individual organizations can define their own Secondary Worlds. This gives the organization a great deal of flexibility in providing goods and services and, more broadly, increasing the efficiency of their organization. In one embodiment, a software tool is provided that enables individual organizations to define and maintain their own Secondary Worlds.

[0064] In one embodiment, each secondary world can be uniquely identified as a name space (e.g. an XML namespace). This ensures that any overlap in names between the Secondary World and the Master World will not result in a collision. As an example, consider the following: the Master World might contain an entity identified as "Chicago" referring the city. A Secondary World that is established by the National Basketball Association (NBA) and a different Secondary World that is established by the Caterpillar Corporation might also have entities named "Chicago" that refer to completely different entities than the Master World's "Chicago." For example, the NBA's "Chicago" might refer to an NBA market area while Caterpillar's "Chicago" might refer to a sales district. Having the namespace separation between the Master and Secondary Worlds can ensure that there not a collision between identically named entities because each name space is uniquely different from every other namespace.

[0065] Fig. 5 is a flow diagram that describes steps in a method of building a context-aware data structure. These

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steps are implemented by a software tool that is executing on a computing device.

[0066] Step 500 receives input from a source that specifies information that pertains to physical and/or logical entities. In this example, a system administrator might physically enter information about the structure of the Secondary World that they desire to define. This information can include information about buildings, divisions, conference rooms and the like. Step 502 then processes the information to define a hierarchical tree structure that has a context. In this example, the context is location. It will be appreciated, however, that other contexts could be employed. Each of the nodes in the hierarchical tree structure represents a separate physical or logical entity. Step 504 then links at least one of the nodes of the hierarchical tree structure with another tree structure having a context. In this example, this other tree structure can comprise the Master World. Once the tree structures have been built and linked, they are ready for traversal in a manner that enables context to be derived from one or more of the nodes.

Location as a Service

[0067] In the above examples, the computing device is able to determine its own location. In the embodiment about to be described, the computing device determines its location by using location information that is provided to it from a number of different sources of information. The device is able to take the information that is provided to it and process the information to determine a particular node on one or more hierarchical trees. Once the device has done this, it can determine its complete location which is a useful thing to know particularly when there are location-dependent services that can be consumed by the device's user.

[0068] Fig. 6 shows a high level diagram of an exemplary computing device 600 that comprises, among other components, a context service module 602 and one or more context providers 604. The context service module 602 can be implemented in any suitable hardware, software, firmware or combination thereof. In this particular example, the context service module is implemented in software that is executed by one or more device processors. The context service module 602 receives context information from one or more context providers 604 and processes the information to determine a current device context. In this particular example, the device context is the device's location. Accordingly, the context providers are location providers that provide location information, in various forms, to the context service module 602 for processing. The location providers 604 receive information from various sources of context information (location information) 606.

[0069] In the context of this document, a context provider comprises a software component that can either be implemented on the device or off the device. The context provider can also include any suitable hardware, firmware or combination thereof. The role of the context providers are to receive information from sources 606 and convey the information to the context service module 602 so that the context service module can use the information to determine a current device context.

[0070] In the case where the context of the device is the device's location, sources 606 provide various information to the location providers 604 that pertains to the device's current location. As an example, the sources of the information can include various information transmitters such as a GPS system, cell phone or cell ID, wireless transmitters that transmit location information, location beacons, 802.11 transmitters and various other sources of information. The sources of information can also include other computing devices that might, for example, provide location information through Bluetooth technology. In addition, a source of information 606 might include a person who, for example, physically enters location information into the device 600 so that the device can process the information to determine its location.

[0071] When the device 600 receives the location information from the sources 606, it processes the information with the location providers 604 and provides the information to the location service module 602. The location service module 602 processes the location information and determines a particular node on one or more of the hierarchical tree structures to which it has access which corresponds to its current location. The location service module 602 can then traverse the tree structures to determine a complete location for the device. Once the complete location is determined, the device 600 can begin to interact with one or more applications 608 that can query the device about its particular location so that one or more location-dependent services can be rendered to the device. In this example, the applications 608 are illustrated as being separate from the device. It is to be understood, however, that the applications could be executing on the device, e.g. a browser application.

[0072] As shown, the applications 608 can make calls to the device to ask the device where it is located. The device is configured to receive the calls and respond in an appropriate manner to the application. Once the application has the device's location information, it can then render location specific services to the device.

[0073] **Consider the following example:** You are a traveler and have a hand-held mobile computing device that contains a Master World tree and a Secondary World tree for SeaTac International Airport. You are scheduled to depart on a plane for China from Concourse C. SeaTac International Airport has designed its Secondary World to have the following nodes: "Arrivals", "Departures", "Concourses", "Airlines", "Gates assigned to Airlines", and "Gate Location". When you arrive at the airport, as you enter the airport your computing device receives location information from

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different sources and with that information your device determines that your location is in the Arrivals node. SeaTac International has bank of servers that are executing applications to assist you while you are in the airport. There are applications that can help you find services, locate facilities (e.g. coffee shops, restaurants), give directions (e.g. how to get to your departure gate), update you on the status of your flight, and even check you in automatically for your flight. Consider also that as you walk through the airport your location changes. Your computing device, however, can receive continuous location information updates so that it can continue to determine its location as you move through the airport. At one point, as you pass a Starbucks coffee shop, your hand held device notifies you that if you purchase a latte at Starbucks and present your hand held device, you will receive a 50 cent discount on your latte. In this example, the utility of the Secondary World is demonstrated. By knowing where its particular customers are in its facility, SeaTac International is able to provide a host of services that were not possible before.

[0074] Assume further that you are in the airport and your flight is canceled. You must find a place to stay for the night. Accordingly, you wish to determine the closest Double Tree hotel because you really like the warm chocolate chip cookies they give you when you check in. You execute a search engine on your computing device to find the nearest Double Tree hotel. The search engine application first determines your current location in the Master World as indicated by the EID of the Master World node that corresponds to your location. Executing a search, the search engine application looks for a Double Tree hotel that has an attribute that includes an EID that matches your EID. If it finds one, it simply indicates for you the result. If it does not find one with the corresponding EID, it can use an adjacent geozone to search for a Double Tree hotel. It may also provide driving directions to the hotel. The search engine application was able to do this because it was able to ascertain your location in the Master World. It did this quickly and automatically with little or no effort from you.

[0075] Consider further that as you are driving from the airport to the hotel you decide that you want to find the nearest Kinko's so that you can print 100 copies of a presentation that you are to give in the morning. Consider that your hand-held computing device is a cellular phone and that Sprint is the carrier. Sprint has defined its own Secondary World that might, for example, be designated in terms of cell nets. By virtue of having Sprint's Secondary World on your computing device, you are able to ascertain your location in Sprint's Secondary World and, accordingly, your location in the Master World. Consider that Kinko's also has a Secondary World that links with the Master World. By executing a search application on your device, you are able to ascertain the location of the nearest Kinko's as well as driving directions thereto. All of this is possible because your device has access to the Master World and one or more Secondary Worlds. In this example, the Master World provides a mechanism to daisy chain two or more Secondary Worlds together. This is possible because the Secondary Worlds have at least one reference or link into the Master World.

Exemplary Device Architecture

[0076] Fig. 7 shows computing device 600 in somewhat more detail. In this particular embodiment, device 600 comprises an architecture that includes the following components: a location service module 602, a location provider interface 700, an application program interface (API)/Events module 702, a privacy manager 704 a location conversion module 706, one or more applications 608 and one or more location providers 606. Also included in the architecture is an active directory 708, Web service 710, location database 712, and personal places 714. The architecture can be implemented in any suitable hardware, software, firmware or combination thereof. The architecture mentioned above is advantageous in that it enables each computing device to determine its own context or location.

Common Location Provider Interface

[0077] One particularly advantageous aspect of the described embodiment is that it employs a common interface 700 that provides a standard interface through which the location providers 606 communicate. By having a common interface, the location providers are extensible (to support future providers) in that they can be dynamically added or removed from the collection of location providers. All that is required of a particular location provider 606 is that it be written to support the common interface.

[0078] In this example, there are several location providers 606. These location providers provide location information in different forms. For example, a GPS location provider might provide location information that is GPS specific. Similarly, an IP/Subnet location provider might provide information that is specific to an Internet Protocol. A mobile phone location provider might provide location information in the form of a cell ID. In addition, a location User Interface (UI) might provide location information in the form of a user entry that specifies a city, street or building. All of the location information that is provided by the various location providers is processed by the location service module 602 so that a current device location can be determined. To determine the current device location, the location service module 602 may have to consult with an active directory 708, a Web service 710, or a location database 712. In the illustrated example, the active directory 708 might, for example, maintain a secondary world and other networking metadata such

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as subnet and "site" information that can help determine location based on networking connectivity. Web service 710 can hold the master or secondary worlds, the attributes of which can be used to find location. For example, if a cell phone knows its cell tower ID, then the location provider can query the secondary world to ascertain the nodes that match that cell tower ID. Location database 712 is basically a version of the web service that is hosted or cached locally.

Location Providers

[0079] As indicate above, the architecture contemplates multiple different location providers that can provide location information to the location service module 602. This information can come in many different forms and quality levels. The information is then processed by the location service module 602 to determine a current device location. To do this, the service module 602 ascertains from the location information a particular node ID (BID and/or LUID) and a URL that is associated with the tree structure with which the node is associated. Once the location service module ascertains a node ID, it can then query the tree structure (or more accurately a server that manages the tree structure) using the URL to ascertain more information about the tree structure. For example, if the location service module 602 ascertains a LUID from a particular Secondary World, it might then query an active directory 708 (or an Intranet server—which is another location database) to discover the parents and the children of the node. This would then enable the location service module to build the Secondary World.

[0080] The location providers 606 can provide the location information to the location service module 602 in many different ways. For example, some location providers 606 may continuously provide information (e.g. the GPS provider may continuously provide GPS coordinates). Alternately, the location providers can periodically provide location information such as at specific times or on the occurrence of definable events. For example, a user may define specific times when the location information should be updated. Alternately, the location information might be updated only when a device's location changes (i.e. a location change event). Additionally, the location providers might provide location information when polled by the location service module 602. For example, the location service module 602 can call the location provider interface 700 and request location information from one or more of the location providers.

[0081] One specific location provider 606 is shown as a cache. The cache provider essentially maintains a current device context or location. That is, once the location service module 602 has ascertained its current location, it writes this location to a cache. This enables the device 600 to ascertain its location with a degree of confidence in the event all of the other location providers are not able to provide location information (e.g. the GPS provider may not receive GPS information because the GPS transmitter that supplies it with the information is unable to contact a requisite number of satellites).

Confidence and Accuracy Parameters

[0082] One important and useful feature of the described embodiment is that one or more of the location providers are configured to assign confidence parameters and/or accuracy parameters to the information that they provide to the location service module 602. Confidence parameters provide a measure of a provider's confidence in the information that it provides to the location service module 602. For example, assume that a GPS transmitter must receive information from five or more satellites in order to provide highly confident information. Assume that only three satellites are available at the time. The GPS transmitter would then transmit its information based only on the three satellites. The GPS provider would then know that the information it receives from the GPS transmitter was based only on three satellites rather than the desired five or more. In this case, the GPS provider can set a confidence parameter on the location information that indicates that it has a lower confidence level than if the information were based on the desired five or more satellites. In this case, the location service module 602 can take the confidence parameters for all of the location providers into account when determining the location of the device. This is discussed in more detail below.

[0083] With respect to the accuracy parameters, consider that the location information that is received from the location providers is accurate to varying degrees. Some information may be accurate to within one mile, while other information may be accurate to within 100 feet. The location providers are desirably configured to assign accuracy parameters to the location information that they provide to the location service module 602. The accuracy parameters give the location service module an indication of the accuracy of the information.

[0084] When the confidence and accuracy parameters are used by the location service module 602, the module can make decisions on how to use the location information it receives from each provider. For example, the location service module 602 might disregard completely any information that has a low confidence parameter. It might, on the other hand, strike a balance between the accuracy of the information and its confidence. For example, the module 602 might be programmed to use information with lower levels of accuracy only when there is a high level of confidence in the information. The module 602 might utilize the parameters to assign weights to the information so that the location is calculated as a weighted function of the confidence and accuracy of the information.

[0085] Another use of the confidence parameters is as follows: Assume that the location service module has deter-

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mined a device location and has written that location to a cache. At the time when the location is written to a cache, it is assigned perhaps a high confidence level. Assume further that all of the other location providers are unavailable to provide location information. For a period of time, the location service module 602 can use the cache location as a current location and be fairly confident that its information is generally accurate. In this case, the location service module might assign a linearly decreasing confidence level to the information over time so that at some point, it ceases to use the information or informs the user that the information cannot be guaranteed.

Location, Trust, and Timestamp

[0086] When the location providers provide their information to the location service module 602, the information can include, in addition to the confidence and accuracy parameters, the actual location information in a known format, a trust parameter and a timestamp. The trust parameter is a metric that is assigned by the location service module 602 to one or more of the location providers and defines the trust that the location service module has for the particular location provider. The timestamp is a metric that defines the time when the location information was provided by the location provider. This assists the location service module 602 in ascertaining whether information is stale and might need refreshed.

[0087] Once the location service module 602 has all of the location information, it can then set about determining the location of the device.

[0088] Fig. 8 is a flow diagram that describes steps in a method of determining a device context which, in this example, is the device location. These steps are implemented by the location service module 602.

[0089] Step 800 gets the current device context. The current context can be the last calculated device context that is stored in the cache. Step 802 determines whether any of a number of context providers are available to provide context information. The location service module might do this by polling the context providers to ascertain which of the providers are active and valid. Step 804 determines whether all of the providers are inactive. If all of the providers are inactive, step 806 decreases the confidence in the current context over time and uses the current context as the device context. Step 802 then continues to monitor for current active and valid providers. If step 804 determines that one or more of the context providers are active, then step 808 orders the active and valid context providers. When the location service module 602 orders or sorts the context providers, it does so as a function of the confidence of the provider's information and/or the trust that the location service module has in the location provider. This provides a ranked list of the location providers. Step 810 checks to ascertain whether the context information appears to be correct. For example, where the context is the location of the device, the location service module 602 might know that five seconds ago the current location was Redmond, Washington. Accordingly, location information that indicates that the current location is Beijing, China would be incorrect. Step 812 then determines whether any of the context information conflicts with either the device's current context or the context information from other providers. For example, the location service module 602 can compare the context information from each of the context providers with the information in the cache. If any of the information conflicts with the cached information, then the information from that context provider can be discarded. Similarly, if context information varies inordinately as between the context providers, then step 814 can select the context providers having a predefined level of trust and perhaps use just their information (Step 816). If there are no conflicts, then step 816 determines the current context based upon the information that is provided by all of the context providers. In the described embodiment, this step is implemented by using the information to map to a particular node in one or more of the hierarchical tree structures mentioned above. For example, the location of the device can be ascertained by mapping the information to a particular node, and then completely traversing the tree structure until the root node is reached. Step 818 then updates the current context by perhaps writing it to the cache and returns to step 802 to determine the active and valid context providers.

[0090] The method described above provides a way for the location service module to receive location information and use only the location information that appears mostly likely to represent a current location. Conflicting information can be discounted or disregarded thereby assuring that only the most trusted, accurate and confident information is utilized to determine the device's current location.

Self Monitoring

[0091] In addition to the confidence and accuracy parameters, one or more of the location providers are advantageously programmed to self monitor their own operation for various irregularities that can occur. On the occurrence of an irregularity, the location providers are configured to notify the location service module 602. For example, the source from which the location provider receives its information may go off line for a period of time so that the location provider is unable to receive any additional information. In this case, the location provider might generate a "provider out" message and send it to the location service module 602. When the location service module 602 receives the "provider out" message, it can then take steps to exclude the location information from that provider from any location calculations

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that it performs. When the location provider's source comes back on line, it can generate a "provider on" message that informs the location service module 602 that it is able to transmit location information to the module. Of course, the location service module can be notified by the location providers on the occurrence of other operational irregularities, with the above example constituting but one specific case.

Applications

[0092] Once the location service module 602 has determined the device's location, it can receive queries from one or more applications 608. In the Fig. 7 example, the applications include a web site application, an Outlook application, and a service discovery application. In the present example, the web site application can be any web site application that is capable of rendering location-specific services. For example, the user of the device 602 might access Amazon.com's web site to buy a favorite book. When the user purchases their book, Amazon.com must now compute the taxes that the user must pay. In this example, a script executing on Amazon.com's web site might query device 602 to learn of the user's location. In this particular example, the device might respond to the query by returning the state in which the user is making the purchase. Amazon.com can then assess the tax automatically. Amazon.com might also desire to know where the individual is located so that they can select an optimal shipping method (UPS or Express Mail). Depending on where the individual is located, one method may be preferred over the other. The Outlook application might query the location service module to ascertain the location because it (or the operating system, e.g. Windows) may change device settings based on the location of the computing device. For example, the user may print on one particular printer while at work, and another particular printer when at home. When the Outlook application determines that the user has gone home for the day, it can automatically change the device settings for the printer at the user's home. It might acquire the print settings from a personal places data store 714. Thus, the device is automatically configured for use depending on the user's location. The service discovery application might query the device to determine its location so that it can render a particular service depending on where the device is located. For example, if the user asks the application to locate the nearest color printer, the service discovery application might query the location service module to ascertain the device's current location so that it can use this information and find the nearest color printer. Consider also that the Outlook application could configure itself email to a work location (when an individual is at work) or to a home location (when an individual is at home). In addition, the Outlook calendar can become location aware, e.g. when you change time zones, your appointments would show up in the proper time slots.

[0093] As one can imagine, the possibilities are seemingly endless. This functionality is made possible through the use of the Master World and one or more Secondary Worlds.

Application Program Interface/Events

[0094] In the described embodiment, the applications 608 communicate with the location service module 602 through one or more application program interfaces (APIs) and/or events. The applications can make function calls on the API to query the location service module as to its current location. Similarly, the applications can register for location notifications by using an events registration process. For example, an application may register for a notification when the user changes their location. Consider the case where an application requests to be notified when the user arrives at work or at home so that the application can change the device's configuration (such as printer configuration).

[0095] Fig. 9 is a flow diagram that describes steps in a method in accordance with the described embodiment. The steps that are described are implemented by device 600. Step 900 receives information that pertains to the current context of the device. In this particular example, a portion of the information is received from one or more context providers which, in this case, are location providers. Step 902 processes the information on and with the device to ascertain the current context of the device. In the illustrated example, the device maintains (or has access to) one or more of the Master World and one or more Secondary Worlds. When the device receives all of the location information, it maps the information to a particular node in the hierarchical tree structure that defines the Worlds. It then traverses the tree structures to ascertain the complete context (i.e. location) of the device. Step 904 receives calls from one or more applications that request information that pertains to the device's current context or location. In the illustrated example, the applications can call one or more APIs to request the information or the applications can register for event notifications. Step 906 then supplies the applications with at least some information that pertains to the current device location. As will be discussed below, a security policy or privacy policy can be applied to the information before it is returned to the applications.

Privacy Manager

[0096] In one embodiment, a privacy manager 704 (Fig. 7) is provided. Although the privacy manager is illustrated as being incorporated on the device, it could be implemented by a trusted entity such as a trusted server that is not

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part of the mobile computing device. The privacy manager can be implemented in any suitable hardware, software, firmware or combination thereof. In the illustrated example, the privacy manager comprises a software module that is incorporated in the mobile computing device.

[0097] The privacy manager 704 addresses privacy concerns that are associated with the information that is collected by the computing device. Specifically, the location service module can calculate detailed information regarding the location of the computing device. It may be desirable, in some instances, to filter the information that is provided to various applications. That is, it is entirely likely that a user may not want their specific location information provided to untrusted applications. In these instances a user might just desire for location service module 602 to inform such applications that the user is in the State of Washington.

[0098] Fig. 10 shows a flow diagram that describes steps in a privacy protection method in accordance with the described embodiment. These steps can be implemented by the privacy manager 704.

[0099] Step 1000 defines a plurality of privacy levels. Exemplary privacy levels are set forth in the table immediately below:

Privacy Level	Approximate Scale	Level of Revelation
0	-	No location information is returned
10	100,000 Km	Planet/Continent
20	1,000 Km	Country
30	100 Km	State
40	10-100 Km	City & County or Region
50	10 Km	Postal Code & Phone Area Code
60	1 Km	Full Postal Code (Zip + 4) & Area Code and Exchange
70	100 m	Phone Number & Building/Floor
80	10m	Room #
90	1m	Exact Coordinates

[0100] In the illustrated table, 10 different privacy levels are defined and each has an associated approximate scale. For example, a privacy level of 0 means that no location information is returned. A privacy level of 90 means that very detailed location information is returned.

[0101] Step 1002 assigns various privacy levels to the individual nodes in one or more hierarchical tree structures. For example, each node of the Master World and the Secondary Worlds can have a privacy level associated with it. The root node of the Master World tree structure might have a privacy level of 10, while the node that represents a current location in a Secondary World might have a privacy level of 90. Step 1004 determines the context of the computing device. In the present example, the context is the device location and examples of how this is done are given above. Individual applications that call the location service module can have privacy levels associated with them. These privacy levels can be assigned by individual users. For example, a trusted application might have a privacy level of 90, while an untrusted application might have a privacy level of 30. Step 1006 receives context queries from one or more applications. Here, an application calls the location service module 602 (Fig. 7) to ascertain the location of the device. Step 1008 determines the privacy level associated with the application or applications. For example, if a untrusted application calls to request location information, the privacy manager 704 would determine that the application has a privacy level of 30. The privacy manager then traverses (step 1010) one or more hierarchical tree structures to find a node with a corresponding privacy level so that it can select the information that is associated with that node. In this example, the traversal might involve jumping from the Secondary World to the Master World to find the node that corresponds to the state in which the user is located. Once the corresponding node is found, step 1012 returns the context information (e.g. location information) associated with the node. In this case, the location service module would inform the application that the user's location is the State of Washington.

[0102] As an example, consider the following: There is a web site that gives up to the minute weather of various locations. Accordingly, you might assign this web site a privacy level of 60 so that you can receive weather information for the geographical area that corresponds to your present full postal code. Another web site might be a corporation intranet web site that is a trusted web site. Thus, any applications associated with this web site can be assigned a privacy level of 90 so that you can give them precise location information as to your whereabouts.

[0103] Thus, in the present example, the computing device is able to determine the source (i.e. application) of its queries and modulate the information that is returned to the application as a function of the application's identity. The

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computing device is able to do this because it has access to the Master World and one or more Secondary Worlds. The above description constitutes but one exemplary way of accomplishing this feat.

Location Beacons as a Location Provider

[0104] In one embodiment, one of the location providers comprises a location beacon that beacons or transmits information to enable a computing device to actively participate in its current context. Location beacons can comprise standalone devices that can be retrofitted onto existing infrastructures, e.g. a smoke detector or wall outlet in order for the device to have a power source.

[0105] Fig. 11 shows an exemplary beacon 1100 that is mounted on a structure 1102. Structure 1102 can be any suitable structure such as a wall in a conference room or public place, a smoke detector, an electrical socket and the like. In the described embodiment, the location beacons are small inexpensive devices that can be permanently mounted in special locations such as conference rooms, building lobbies, airport gates, public places and the like. The beacons announce the physical location in the form of an EID and/or LUID to all mobile devices that are within range, such as laptops, tablet PCs, hand held computers, mobile phones, wearable computers and the like.

[0106] In the described embodiment, the location beacon can identify the particular locations by beaconing standard information that will be understood by the mobile computing devices. In the present example, the beacons can transmit one or two location identifier pairs comprising an EID/URL pair and a LUID/URL pair. The beacon might also transmit multiple LUIDs. The EID and LUID give the present node location in the Master World and Secondary World respectively. The URLs provide a reachable location for the Master and Secondary Worlds. For example, the URL associated with the Secondary World can give a service location that the device can use to query information about the Secondary World so that it can derive its context and take advantage of resources or services that are associated with the nodes in the Secondary World.

[0107] The beacons can also transmit a digital signature that can be used by the device to ascertain that the beacon is valid and legitimate. Any suitable signature or verification method could be used. In addition, and of particular use in the context-aware environment, the beacon can be programmed to transmit code download pointers to devices within range. The code download pointers can enable the computing device to access software code that permits them to interact with their environment. Consider the following example: You walk into a conference room with your cell phone computing device and immediately a beacon in the conference room transmits your location in the form of an EID/URL pair and a LUID/URL pair. Your device uses the information pairs to ascertain its location in the Master and Secondary Worlds as described above. The beacon also transmits a code download pointer that points to software code that enables you to operate the video projector in the conference room using your hand-held cellular phone. In this manner, the beacon serves as more than just a location beacon—it permits you, through your computing device, to actively participate in your surroundings.

[0108] The beacons can transmit the information in any suitable way, e.g. wireless methods including infrared and radio frequencies. In one embodiment, Bluetooth short range radio frequency communication can be used to provide a low cost, low power alternative.

Context-Aware Vehicle

[0109] Fig. 12 shows an exemplary vehicle (e.g., automobile) computer system 1200 that can be used in connection with the context-aware systems and methods described above and below. System 1200 is configured for use in a vehicle such as a car, truck or other similar conveyance. When in place in a vehicle, computer system 1200 can provide a multitude of context-aware services as will become apparent below.

[0110] Vehicle computer system 1200 has a centralized computer 1202 coupled to various external peripheral devices, including a display device 1204, security sensors 1206, a vehicle diagnostic interface 1208, speakers 1210, a vehicle battery 1212, a backup battery 1214, and antenna(s) 1216. The computer 1202 is assembled in a housing 1218 that is sized to be mounted in a vehicle dashboard, similar to a conventional automobile stereo. In the illustrated example, the housing 1218 has a form factor of a single DIN (Deutsche Industry Normen). Alternatively, it could be housed in a 2 DIN unit or other special form factor for an OEM.

[0111] The computer 1202 runs an open platform operating system which supports multiple applications. Using an open platform operating system and an open computer system architecture, various software applications and hardware peripherals can be produced by independent vendors and subsequently installed by the vehicle user after purchase of the vehicle. This is advantageous in that the software applications do not need to be specially configured for uniquely designed embedded systems. In the illustrated example the open hardware architecture runs a multitasking operating system that employs a graphical user interface. A multitasking operating system allows simultaneous execution of multiple applications. One such operating system is the "Windows" brand of operating systems (e.g., the "Windows CE" operating system) sold by Microsoft Corporation of Redmond, Washington.

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[0112] The computer 1202 can include at least one storage drive which permits the vehicle user to download programs and data from a storage medium. In the illustrated implementation, the computer 1202 has a CD ROM (or other optical) drive 1220 which reads application-related CDs, as well as musical, video, game, or other types of entertainment CDs. The computer 1202 may also include other storage devices, such as a magnetic disk drive, smart card reader, PCMCIA card sockets, a hard disk drive, or a DVD ("digital video disk" or "digital versatile disk") drive.

[0113] The storage drives are mounted in a base unit 1228 of the housing 1218. The base unit 1228 is constructed and sized to be mounted in the dashboard. Optionally, this base unit may be removable in the same fashion as a laptop computer and its associated docking station. This option allows the user to take the vehicle computer to his/her home or office to serve as his/her portable PC. The housing 1218 also has a faceplate 1230 which is pivotally mounted to the front of the base unit 1228 and may optionally be detachable. The faceplate can be rotated to permit easy and convenient access to the storage drives.

[0114] The computer 1202 has a keypad 1232 and a display 1234 on the faceplate 1230. The operating system executing on the computer 1202 controls the faceplate peripheral, which, through the faceplate processor, can control the faceplate keys 1232 and the faceplate display 1234 as peripheral devices when the faceplate is attached to the base unit. Additionally, the computer 1202 has a voice recognition device to permit the user to verbally enter commands in a hands-free, eyes-free environment. These voice commands can be used for controlling most operating modes of the vehicle computing platform. The computer 1202 is also equipped with an IrDA (infrared developers association) transceiver port 1236 mounted on the faceplate 1230 to transmit and receive data and programs using infrared signals. The entire faceplate unit 1230 behaves as a multifunction peripheral to the computing platform.

[0115] The computer 1202 can output visual data to the LCD 1234 at the faceplate, or to the display device 1204. In the exemplary illustration, display 1234 is a back lit LCD and display 1204 is a small flat panel display (e.g., 6.4" screen) that is movably mounted on a stand or yoke and remotely located from the computer. Additional display devices may also be added that are similar to display 1204 or 1234. Different types of display devices may also be added, such as a Heads Up Display (HUD).

[0116] The display 1204 is fully adjustable to different viewing positions that can be seen by the driver or other passengers in the vehicle. The type of data displayed can range widely from word instructions concerning the vehicle's performance, to diagrammatic directions from a navigation system, to video movies for in-car entertainment. The display 1204 can be equipped with an automatic override switch 1238 which automatically disables the display of any non-driving related data when positioned to be viewed by the driver. When facing the driver, only information supportive and helpful to driving (e.g., diagnostics, navigation directions) is displayed on the monitor, while distracting information (e.g., video movies, games) is blocked from display. In one implementation, the switch is an electrical cylindrical switch which closes when the display is capable of being viewed by the driver; thus, the software can sense the display position and only allow permitted information to be displayed.

[0117] In general, the vehicle computer system 1200 can be used to integrate multiple vehicle-related systems onto one open platform hardware and software architecture. For instance, the vehicle computer system 1200 can serve as a multimedia entertainment system, a navigation system, a communications system, a security system, and a diagnostics system. Moreover, the vehicle computer system 1200 provides additional functionality traditionally associated with desktop and laptop personal computers. For instance, vehicle computer system 1200 can support word processing applications, spreadsheet applications, database applications, web browser applications, and appointment/schedule applications. Furthermore, the vehicle computer system 1200 can be configured to operate as a server to other computing units in the vehicle to distribute games, video movies, and the like to passengers. Furthermore, the system includes an internet connectivity engine 1240 that is configured to establish connectivity with the Internet. This can be done in any suitable way. For example, the internet connectivity engine 1240 can wirelessly establish connectivity with the Internet through known wireless techniques.

[0118] In accordance with the described embodiment, information can be displayed on either display device 1204 or display 1234. The information can be provided by an application running on computer 1202, or by a device external to computer 1202, such as sensors 1206 or via diagnostic interface 1208, antenna 1216, IrDA port 1236, etc. Such information can also be provided to the computer via the internet connectivity engine 1240. Information that can be displayed includes any type of data or control information. Additionally, information to be displayed can include a "caption" or "label" that describes the data. Examples of data that can be displayed include street addresses, phone numbers, and directions (e.g., "Turn Left At Light On Main Street"). Such data can be displayed either including a caption describing the data (e.g., "Address: 12345 Washington Street", where "Address:" is the caption portion of the information) or without a caption (e.g., "12345 Washington Street"). Examples of control information include toolbars, menu options, and user-selectable on-screen regions (such as buttons), as well as instructions, headings, and other descriptive information.

[0119] In the discussion herein, the various embodiments are described in the general context of computer-executable instructions, such as program modules, being executed by one or more conventional personal computers. Generally, program modules include routines, programs, objects, components, data structures, etc. that perform particular

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tasks or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the described embodiments can be practiced with other computer system configurations, including hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers, mainframe computers, and the like. In a distributed computer environment, program modules may be located in both local and remote memory storage devices.

[0120] Fig. 13 shows exemplary components of computer 1202 of Fig. 12 in more detail. Computer 1202 includes one or more processors or processing units 1352, a system memory 1354, and a bus 1356 that couples various system components including the system memory 1354 to processors 1352.

[0121] The bus 1356 represents one or more of any of several types of bus structures, including a memory bus or memory controller, a peripheral bus, an accelerated graphics port, and a processor or local bus using any of a variety of bus architectures. The system memory 1354 includes read only memory (ROM) 1358 and random access memory (RAM) 1360. A portion of the operating system, such as kernel 1362, contains the basic routines that help to transfer information between elements within computer 1202, such as during start-up, is stored in ROM 1358.

[0122] A number of program modules can be stored in ROM 1358 or RAM 1360, including an operating system 1364 and one or more application programs 1366. A user may enter commands and information into computer 1202 through various input devices, such as a keyboard (e.g., keypad 1232 of Fig. 12), touchscreen, pointing device, microphone, joystick, game pad, satellite dish, scanner, or the like (not shown in Fig. 13). These and other input devices are coupled to the processing unit 1352 through an input/output (I/O) interface 1368 that is coupled to the bus 1356. A display 1204 or 1234, or other type of display device, is also connected to the bus 1356 via an interface, such as a video adapter (s) 1370. Data to be displayed on display 1204 or 1234 is provided to adapter 1370 by a display generator 1372 of operating system 1364. In addition to the display, computers can include other peripheral output devices (not shown in Fig. 13) such as speakers and printers that are coupled to the processing unit 1352 through I/O interface 1368.

[0123] Generally, the processors of computer 1202 are programmed by means of instructions stored at different times in the various computer-readable storage media of the computer. Programs and operating systems are typically distributed, for example, on floppy disks or CD-ROMs. From there, they are installed or loaded into the secondary memory of a computer. At execution, they are loaded at least partially into the computer's primary electronic memory. For example, the above-described context and location service can be stored in this manner so as to permit the computer to make full use of the context-aware (location-aware) applications described above and below.

[0124] The embodiments described herein include these and other various types of computer-readable storage media when such media contain instructions or programs for implementing the steps described below in conjunction with a microprocessor or other data processor. The described embodiments also include the computer itself when programmed according to the methods and techniques described below. Furthermore, certain sub-components of the computer may be programmed to perform the functions and steps described below. The described embodiments include such sub-components when they are programmed as described. In addition, the described embodiments include data structures, described below, as embodied on various types of memory media.

[0125] For purposes of illustration, programs and other executable program components such as the operating system are illustrated herein as discrete blocks, although it is recognized that such programs and components reside at various times in different storage components of the computer, and are executed by the data processor(s) of the computer.

Exemplary Context-based Architecture

[0126] Fig. 14 shows an exemplary architecture 1400 that can be utilized to implement a context-aware vehicle. Some of the components of the architecture are similar to or the same as components that have already been discussed above. To this extent, these components are not described in additional detail here. These components include an application program interface/events component 1402, context service module 1404, context provider interface 1406, and privacy manager 1408.

[0127] Additional components that are germane to this discussion include one or more applications 1410 that are executable on the vehicle's computer, one or more context providers 1412, a context data store 1414, and a behavior engine 1418.

[0128] Applications 1410 can include any suitable applications that are capable of being executed in connection with a vehicle such as an automobile. Exemplary applications can include those that are used to implement or be used in connection with audio/visual equipment or peripheral devices such as the radio, entertainment devices, visual displays, temperature regulation devices, and various controllers that can be associated with equipment on the vehicle, to name just a few.

[0129] The context providers 1412 can be any suitable context providers that are capable of providing context information, via the context provider interface 1406 and context service module 1404, to the behavior engine 1418. Context providers can include such things as environmental sensors (e.g. light, heat, smog and the like). It will be appreciated

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that although the context providers are shown as being on the computing device itself (i.e. located on the vehicle), the context providers can be located off of the vehicle. For example, context providers can broadcast wireless context information for receipt by the computing device.

[0130] Context store 1414 can store per-user context preferences that are available locally and/or it can cache per-user context preferences that are present somewhere outside the vehicle. This store can also be used to store context preference information that is common to all users (per-vehicle). This store can also be used to temporarily store all the context data that is being provided by the various context providers. This way, the behavior engine can act on this data at a later time, rather than instantaneously. In addition, the store can hold per-vehicle data. User-specific context information can pertain to any suitable type of context information. As an example, the user might provide their preferences for seat settings, vehicle temperature, vehicle interior lighting, radio volume and the like. These preferences can be maintained on the vehicle in a vehicle store, or externally of the vehicle in, for example, a network accessible data store (e.g. a data store accessible via a Web server).

[0131] Behavior engine 1418 comprises a software module that receives context information from one or more sources and manipulates in some way or causes the behavior of the vehicle to be manipulated. Manipulation of the vehicle's behavior can manifest itself, in the illustrated example, through settings or other parameters that are passed from the behavior engine 1418 to one or more applications 1410 and that affect the behavior of the vehicle. The settings or parameters thus cause the application to function, in some way, in a manner that is unique to the context in which the vehicle is determined to be.

[0132] As an example consider the following: A vehicle is traveling on a long trip that started early in the morning. As dusk approaches, a context provider 1412 in the form of a light sensor provides information to the context service module 1404 which, in turn, ascertains that outside lighting conditions are sufficient to require the headlights to be turned on. Accordingly, the behavior engine 1418 causes the application associated with the headlights to turn the headlights on. In this specific example, the behavior engine can also cause the application associated with the driver's display to change the light contrast setting so that the driver can more easily view the display. This solution, as well as the other solutions described below, can be advantageously implemented in software so that the necessity of building any hardwired hardware solutions is eliminated.

[0133] As another example, consider the following: While traveling in a context-aware vehicle, the vehicle enters an area where there is a large amount of smog. A context provider in the form of a smog sensor provides information to the context service modules which, in turn, determines that smoggy conditions exist. As a result, the behavior engine 1418 causes the application 1410 associated with the vehicle's ventilation system to automatically shut off the outside supply of air.

[0134] Fig. 15 is a flow diagram that describes steps in a method in accordance with the described embodiment. The method can be implemented in any suitable hardware, software, firmware, or combination thereof. In the illustrated example, the method is implemented in software. In a specific implementation, this method can be implemented in connection with the architecture shown in Fig. 14.

[0135] Step 1500 receives context information. This information can comprise any suitable type of information and can be received in any suitable way. For example, the context information can comprise user-specific information. This user-specific information can be received from a user who physically enters the information into the vehicle's computer. Alternately, the user-specific information can be retrieved from a data store, either onboard or remote from the vehicle. If the information is onboard the vehicle, the information can simply be retrieved from whatever data store holds the information. If the information is maintained remote from the vehicle (e.g. in a Web-accessible data store), the information can then be retrieved in any suitable way such as via a wireless connection with the Web that is then used to access the remote data store and retrieve the information.

[0136] The context information can also comprise information associated with the vehicle's operating environment and can be gleaned from various different sensors that can be provided on the vehicle. Examples of this are given above.

[0137] Step 1502 determines, from the context information, a current vehicle context. This step can be implemented by a context service module such as module 1404 in Fig. 14. The current context can be determined by ascertaining the current vehicle user. The current context can also be determined by making a decision, based upon the context information, about the likely context of the vehicle. For example, if the context information suggests that it is likely dark outside of the vehicle, a decision concerning the current context can be made with an ascertainable degree of certainty. Based on the current vehicle context, the behavior of the vehicle can then be modified in some way or manner that is consistent with the vehicle's current context (step 1504). This step can be implemented by a behavior engine such as engine 1418 in Fig. 14. The behavior engine receives information from the context service module 1404 indicating the current vehicle context. Based on this, the behavior engine can cause settings or other parameters to be passed to applications associated with the context so that the applications can modify the behavior of the vehicle in some way.

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Exemplary Location-Based Architecture

[0138] Fig. 16 shows an exemplary architecture 1600 that can be utilized to implement a location-aware vehicle. Some of the components of the architecture are similar to or the same as components that have already been discussed above. To this extent, these components are not described in additional detail here. These components include an application program interface/events component 1602, location service module 1604, location provider interface 1606, and privacy manager 1608.

[0139] Additional components that are germane to this discussion include one or more applications 1610 that are executable on the vehicle's computer or on the vehicle itself, one or more location providers 1612, a context store 1614, and a behavior engine 1618.

[0140] Applications 1610 can include any suitable applications that are capable of being executed in connection with a vehicle such as an automobile. Exemplary applications can include those that are used to implement or be used in connection with a location-sensitive service. For example, one application can comprise an Internet connectivity application that establishes an Internet connection via a local ISP. For example, the Internet connectivity engine 1240 (Fig. 12) can call a toll free telephone number to get a list of affiliated ISPs and a set of <location, phone number> pairs. This list can also be pre-installed in the vehicle's computer, or downloaded periodically via that Internet. When the user tries to access the Internet, the Internet connectivity engine 1240 calls the location service module 1604 to ascertain the current location. Based on the current location, the Internet connectivity engine 1240 selects an access number that is local to the area in which the vehicle is located. As the vehicle moves between locations, the Internet connectivity engine 1240 can get location updates and update its local access number. Another application can control the radio and its various settings, as will be discussed in more detail below in the section entitled "Radio Station Settings".

[0141] The location providers 1612 can be any suitable location providers that are capable of providing location information, via the location provider interface 1606 and location service module 1604, to the behavior engine 1618. Exemplary location providers are discussed above. In vehicle-based applications, however, one source of location information comprises a GPS source that provides GPS information to an onboard location provider.

[0142] Context store 1614 can store per-user location preferences that are available locally and/or it can cache per-user location preferences that are present somewhere outside the vehicle. This store can also be used to store location preference information that is common to all users (per-vehicle). This store can also be used to temporarily store all the location data that is being provided by the various location providers. This way, the behavior engine can act on this data at a later time, rather than instantaneously. In accordance with the described embodiment, users can provide user-specific location information that is maintained in store 1614. This user-specific location information can pertain to any suitable type of location information. As an example, and one that is explored in more detail below, a user might enter their favorite radio stations for several different cities that they travel to often. These preferences can be maintained and, when the location service determines the location of the user's vehicle to be one of the subject cities, the behavior engine 1618 causes the application that is associated with the station controller to automatically program the radio stations for the new city.

[0143] Behavioral engine 1618 comprises a software module that receives location information from one or more sources and manipulates in some way the behavior of the vehicle. Manipulation of the vehicle's behavior can manifest itself, in the illustrated example, through settings or other parameters that are passed from the behavior engine to one or more applications 1610. The settings or parameters thus cause the application to function, in some way, in a manner that is unique to the location in which the vehicle is determined to be.

[0144] Fig. 17 is a flow diagram that describes steps in a method in accordance with the described embodiment. The method can be implemented in any suitable hardware, software, firmware, or combination thereof. In the illustrated example, the method is implemented in software. In a specific implementation, this method can be implemented in connection with the architecture shown in Fig. 16.

[0145] Step 1700 receives location information. This information can comprise any suitable type of information and can be received in any suitable way. For example, the location information can comprise user-specific information. This user-specific information can be received from a user who physically enters the information. Alternately, the user-specific information can be retrieved from a data store, either onboard or remote from the vehicle. If the information is onboard the vehicle, the information can simply be retrieved from whatever data store holds the information. If the information is maintained remote from the vehicle (e.g. in a Web-accessible data store), the information can then be retrieved in any suitable way such as via a wireless connection with the Web.

[0146] Step 1702 determines, from the location information, a current vehicle location. This step can be implemented by a location service module such as module 1604 in Fig. 16. Based on the current vehicle location, the behavior of the vehicle is modified in some way (step 1704). This step can be implemented by a behavior engine such as engine 1618 in Fig. 16. The behavior engine receives information from the location service module 1604 indicating the current vehicle location. Based on this, the behavior engine can cause settings or other parameters to be passed to applications

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associated with the location so that the applications can modify the behavior of the vehicle in some way.

Radio Station Settings

[0147] In one embodiment, a user can specify radio stations and locations associated with those radio stations. Based on the location of the vehicle, the user-specified radio stations for the particular radio stations are mapped automatically to the buttons of the radio when the vehicle's location coincides with a location specified by the user. As an example, consider the following: Assume that 950 AM is the all-sports radio channel in Seattle and 880 AM is the all-sports radio channel in Portland. Further assume that the user has specified that button #1 of the radio is to be associated with 950 AM when his vehicle is located in Seattle and 880 AM when his vehicle is located in Portland. These user specifications are referred to as the user's preferences. The user's preferences are stored in an accessible location such as a per-user location store 1614. Assume now that the user has to travel from Portland to Seattle on business. When the location service on board the user's vehicle ascertains that the vehicle's location is Seattle, the behavior engine 1618 causes the application associated with the radio station controller to map Seattle station 950 to button #1 of the radio. This happens automatically without the need for any user intervention.

[0148] Fig. 18 is a flow diagram that describes steps in a method in accordance with one described embodiment. The method can be implemented in any suitable hardware, software, firmware, or combination thereof. In the described embodiment, the method is implemented in software. Suitable software is described above in connection with Figs. 16 and 17.

[0149] Step 1800 associates one or more radio stations with one or more locations. This step can be implemented by a user establishing such an association by inputting their preferences into the vehicle's computer. This step can also be implemented by a user storing their preferences in some other location that is accessible by the vehicle's computer (e.g. a Web-accessible location). The preferences are then stored in a per-user location store such as the one described above. The store can either be onboard a vehicle or remote from the vehicle. If the store is remote from the vehicle, then the vehicle's computer can establish a suitable connection, for example via the Internet, and fetch the user's preferences. Step 1802 determines the location of the vehicle. Any suitable method or technique can be used to determine the vehicle's location. In this specific example, a location service, implemented in software, can be used. Recall that the location service discussed in this document makes use of hierarchical tree structures in the form of Primary and Secondary Worlds that permit the location service to ascertain its location based upon input from one or more location providers. Once the location is determined, radio stations that are associated with that location are mapped (step 1804) to radio station buttons on the vehicle's radio. This step is implemented, in the present example, through the interaction between the behavior engine 1618 and an appropriate application 1610 that manages the mapping of the radio stations. Once the mapping has taken place, the user is free to select from among the station that they previously specified. Step 1806 then determines whether the vehicle is at a new location. If so, the method determines the new location through the use of the location service and then branches to step 1804 to map any new stations associated with the new location to the radio's buttons. If there is no new location, the method does nothing and simply returns to step 1806.

[0150] The embodiment described immediately above provides a system and methodology by which a user can make radio station preferences for different locations known to the user. These known preferences are then enforced automatically as a function of a vehicle's location.

[0151] In certain circumstances, however, individuals may be unaware of the specific radio stations in all of the potential locations to which they may travel that play the *type* of music or content to which they desire to listen. For example, an individual may not know the specific radio stations in Fresno, San Francisco, Sacramento, and San Diego that play the type of music that they prefer. Accordingly, one embodiment allows the user to associate each of the radio buttons with a radio station type. Exemplary radio station types include, without limitation, those that play light rock, heavy metal, all-news, all-sports, classical, talk shows and the like. The vehicle's computer maintains or has access to a list that associates radio station types, location, and radio station frequency (i.e. station number). This list can be resident on the vehicle's computer, or can be periodically downloaded from the Internet. Now, when a user travels from location to location, the location service determines the vehicle's location as described above, and notifies the vehicle's behavior engine. The behavior engine then causes the appropriate application that manages the radio station selections to map the new radio station frequencies (or settings) to appropriate buttons on the vehicle's radio. In this way, a user need simply specify radio station types and need not know specific radio station settings.

[0152] Fig. 19 is a flow diagram that describes steps in a method in accordance with one described embodiment. The method can be implemented in any suitable hardware, software, firmware, or combination thereof. In the described embodiment, the method is implemented in software. Suitable software is described above in connection with Figs. 16 and 17.

[0153] Step 1900 associates at least one radio station type with a radio button. This step can be implemented by a user specifying their associations or preferences. For example, hard rock can be associated with button #1, soft rock

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with button #2, and so on. These associations or preferences are then either maintained by or accessible to the vehicle's computer. Step 1902 determines the vehicle's location. This step can be implemented as described above. Step 1904 maps, for a given location, each radio station frequency for a radio station type to a radio station button. So, for example, as a user drives from San Francisco to San Diego, their preferences for radio station types (i.e. classical, rock, sports and the like) are automatically and seamlessly made available to the user via the radio buttons.

Location-based Information

[0154] In another embodiment, the location of a vehicle is utilized as the basis to provide the driver with information that can be of interest to them. Specifically, the location service onboard the vehicle determines the vehicle's location as set forth above. Once the location of the vehicle is ascertained, various information associated with or pertaining to that location or locations nearby can be presented to the driver. This information can be any information that might be of interest to the driver. For example, such information can include, without limitation, upcoming weather, traffic reports, rest stops, suggestions regarding food, gas stations, scenic viewpoints and the like. As an example, consider the following: A user indicates in their preferences that they prefer to fill their car with gas from Texaco stations only. While traveling on a trip, the location service determines the vehicle's location. In conjunction with determining the vehicle's location, an application executing on the vehicle's computer informs the driver that there are 3 Texaco stations within the next 100 miles, and the distance to each of the stations. The location service can ascertain this through the use of Primary and Secondary World structures as well as IDs that are associated with each of the Texaco stations, as described above in detail. It will be appreciated that the information that is provided to the user is different from and, in some cases independent of known navigation information (i.e. street maps and directional information and the like). The information that is provided to the users can be associated with one or more user-specified preferences. For example, the user might have specified that they only like to eat at Denny's, Stuckeys, and McDonald's while on the road. Accordingly, once the location service determines the location of the user's vehicle, the user can be advised of the nearest Denny's, Stuckeys, and McDonald's.

[0155] Fig. 20 is a flow diagram that describes steps in a method in accordance with one described embodiment. The method can be implemented in any suitable hardware, software, firmware, or combination thereof. In the described embodiment, the method is implemented in software.

[0156] Step 2000 determines a vehicle location. Location can be determined as described above. Step 2002 provides location-specific information for the user or driver of the vehicle. This information can be provided in any suitable way. In one particularly useful implementation, the location-specific information can be provided via a display that the user can view. The location-specific information can be information that is generally provided to all drivers (i.e. upcoming viewpoints, rest stops etc.). Alternately, the information can be user-specific and can be based on user-provided preferences.

User as a Context

[0157] In one embodiment, one context of a vehicle comprises the user or driver, as was mentioned above. That is, each user or driver is presumed to have preferences that are associated with a user-specific experience that they desire when they use the vehicle. For example, one user might have desired seat settings, while another driver might have different seat settings. When the context is location, different drivers might have different preferences that indicate where they desire to eat, points of interest, radio station types, and the like.

[0158] Consider the case when the vehicle is a rental car. In this instance, the vehicle is subject to use by a large number of users. Each user most assuredly will have different preferences that govern their user experience.

[0159] Fig. 21 is a flow diagram that describes steps in a method in accordance with one described embodiment. The method can be implemented in any suitable hardware, software, firmware, or combination thereof. In the described embodiment, the method is implemented in software.

[0160] In accordance with one embodiment, user preferences are collected (step 2100) and stored (step 2102) or otherwise maintained in a vehicle-accessible location. For example, if the vehicle is a family car, the preferences of family drivers might be stored in a locally maintained store. If the vehicle is a rental car, the preferences might be stored in a large preference store remote from the vehicle. One example of a remote store is one that is accessible via the Internet through, for example, a Web server. For example, Fig. 22 shows a system generally at 2200 that comprises multiple vehicles 2202. Each vehicle is equipped with a vehicle computer 2204 such as that described above. A central server 2206 is accessible via the Internet and has access to a data store 2208 in which user preferences are stored. Each vehicle's computer can wirelessly access the Internet, as described above, so that the computer can gain access to various user preferences.

[0161] In this embodiment, a user of the vehicle first authenticates or identifies themselves to the vehicle (step 2104) at which point their preferences are retrieved (step 2106). As noted above, the preferences can be retrieved from a

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local storage location, or from a remote storage location. A user can authenticate themselves in any suitable way. For example, a password might be used. Alternately, an authentication service like Microsoft's Passport service might be used which authenticates the user via the Internet. Further, alternately, authentication can be implemented through fingerprinting techniques, voice recognition, or any other suitable biometrics techniques. Consider also the following example. A user is a rental car customer and is issued a "Preferred" card. This preferred card uniquely identifies the user. When the user rents a car, the attendant at the rental car counter swipes their card through a card reader which identifies the customer. Based on the customer's identity, a computer retrieves the customer's preferences from a store and communicates the preferences to a car that is waiting for the customer.

[0162] Once the user is authenticated and the user's preferences are retrieved, the behavior engine (1418 or 1618) causes applications executing on the vehicle's computer and which are associated with the subject of the user's preference, to provide a user-specific experience (step 2108). This user-specific experience can involve everything from adjusting the seat settings, to automatically mapping radio station types to radio buttons, to providing location-specific information that may likely be of interest to the user. In the rental car example above, when the customer arrives at their car, their preferences have already been implemented and a user-friendly car is waiting.

[0163] Accordingly, by maintaining or having access to user-specified preferences, the user's vehicle experience can be automatically tailored to a user's likes, while avoiding a user's dislikes. User convenience is enhanced in that once their preferences are established, they need not worry about configuring a vehicle to suit their preferences. This can all be done automatically for them.

Conclusion

[0164] The embodiments described above provide a uniform, standardized way to enhance the world of context aware computing. The embodiments provide a way for individuals to uniquely experience the world around them by ascertaining their location in the world in a standard way. The embodiments also provide a way for service providers to uniquely position their goods and services in a manner that is sensitive to and appreciates the contexts, e.g. locations, of various consumers of the goods and services. Unique and useful architectures and data structures are employed to facilitate the user's computing experience and provide for an individual-centric experience.

[0165] Although the invention has been described in language specific to structural features and/or methodological steps, it is to be understood that the invention defined in the appended claims is not necessarily limited to the specific features or steps described. Rather, the specific features and steps are disclosed as preferred forms of implementing the claimed invention.

Claims

1. A context-aware system comprising:

   a computer configured to be mounted in a vehicle, the computer comprising one or more processors and computer-readable media associated with the one or more processors;
   one or more applications resident on the computer-readable media and configured to be executed on the one or more processors;
   one or more context providers operably associated with the computer and configured to provide context information;
   a context service module configured to receive context information from the one or more context providers and determine a vehicle context; and
   a behavior engine operably associated with the computer and configured to, responsive to the vehicle context, adjust a behavior of the one or more applications so that the one or more applications behave in a manner that is consistent with a current vehicle context.

2. The context-aware system of claim 1, wherein at least one context provider is located on a vehicle in which the computer is mounted.

3. The context-aware system of claim 1, wherein at least one context provider is located remotely from a vehicle in which the computer is mounted.

4. The context-aware system of claim 1, wherein one or more of the context providers are configured to wirelessly receive information concerning a vehicle's context.

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5. The context-aware system of claim 1 further comprising at least one hierarchical tree structure resident on the computer-readable media and having multiple nodes each of which being associated with a context, the context service module being configured to determine a vehicle context by accessing the one hierarchical tree structure and traversing at least one of said nodes.

6. The context-aware system of claim 1 further comprising:

a first hierarchical tree structure resident on the computer-readable media and having multiple nodes associated with a first context;
at least one second hierarchical tree structure resident on the computer-readable media and having multiple nodes associated with a second context, at least one node from the at least one second hierarchical tree structure being linked with one node on the first hierarchical tree structure by a link that is configured to enable a complete context to be derived from the first and second contexts; and
the context service module being configured to determine a vehicle context by accessing multiple hierarchical tree structures and traversing at least one of each of said multiple hierarchical tree structures.

7. The context-aware system of claim 1, wherein the behavior engine is configured to adjust the behavior of the one or more applications based, at least in part, on user-specific context information.

8. A vehicle comprising the context-aware system of claim 1.

9. A method of operating a vehicle comprising:

receiving context information with a vehicle computer, the context information pertaining to a context of a vehicle in which the computer is mounted;
determining, from the context information and using the vehicle computer, a current vehicle context; and
modifying, with the vehicle computer, a behavior of the vehicle responsive to the current vehicle context.

10. The method of claim 9, wherein the context information comprises user-specific information.

11. The method of claim 9, wherein the context information comprises vehicle-specific information.

12. The method of claim 9, wherein the context information comprises user-specific information that is resident on the vehicle's computer.

13. The method of claim 9, wherein the context information comprises user-specific information and said receiving comprises receiving the context information from a data store that is remote from the vehicle computer.

14. The method of claim 9, wherein the context information comprises user-specific information and said receiving comprises wirelessly receiving the context information from a data store that is remote from the vehicle computer.

15. The method of claim 9, wherein the context information comprises user-specific information and said receiving comprises receiving the context information from a data store via the Internet.

16. The method of claim 9, wherein said receiving comprises receiving the context information from one or more context providers that are mounted on the vehicle.

17. The method of claim 9, wherein said receiving comprises receiving context information from multiple context providers some of which being mounted on the vehicle, others of which not being mounted on the vehicle.

18. The method of claim 9, wherein said determining comprises determining the current vehicle context using a software-implemented context service module that can receive context information from multiple different context providers.

19. The method of claim 9, wherein said determining comprises determining the current vehicle context using a software-implemented context service module that can receive context information from multiple different context providers, the context service module being capable of wirelessly receiving at least some of the context information.

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20. The method of claim 9, wherein said determining comprises determining a current user of the vehicle.

21. The method of claim 9, wherein said determining comprises making a decision, based upon the context information, about the likely context of the vehicle.

22. The method of claim 9, wherein said determining comprises:

accessing at least one hierarchical tree structure with the vehicle's computer, the one hierarchical tree structure having multiple nodes each of which being associated with a context; and
traversing at least one of the nodes to derive the vehicle's context.

23. The method of claim 9, wherein said modifying comprises modifying the behavior of one or more applications executing on the vehicle's computer.

24. One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, implement the method of claim 9.

25. A context-aware system comprising:

a computer configured to be mounted in a vehicle, the computer comprising one or more processors and computer-readable media associated with the one or more processors;
one or more applications resident on the computer-readable media and configured to be executed on the one or more processors;
one or more context providers operably associated with the computer and configured to provide context information for use in determining a vehicle context, at least some of the context providers receiving context information from sources remote from the vehicle in which the computer is mounted;
at least one hierarchical tree structure resident on the computer-readable media and having multiple nodes each of which being associated with a context;
a context service module configured to receive context information from the one or more context providers and determine a vehicle context, the context service module being configured to determine a vehicle context by accessing the one hierarchical tree structure and traversing at least one of said nodes; and
a behavior engine operably associated with the computer and configured to, responsive to a vehicle context that is determined by the context service, adjust a behavior of the one or more applications so that the one or more applications behave in a manner that is consistent with a current vehicle context.

26. The context-aware system of claim 25, wherein one or more of the context providers are configured to wirelessly receive information concerning a vehicle's context.

27. A vehicle comprising the context-aware system of claim 25.

28. A location-aware system comprising:

a computer configured to be mounted in a vehicle, the computer comprising one or more processors and computer-readable media associated with the one or more processors;
one or more applications resident on the computer-readable media and configured to be executed on the one or more processors;
one or more location providers operably associated with the computer and configured to provide location information for use in determining a vehicle location;
a location service module configured to receive location information from the one or more location providers and determine a vehicle location; and
a behavior engine operably associated with the computer and configured to, responsive to a vehicle location that is determined by the location service, adjust a behavior of the one or more applications so that the one or more applications behave in a manner that is consistent with a current vehicle location.

29. The location-aware system of claim 28, wherein at least one location provider is located remotely from a vehicle.

30. The location-aware system of claim 28, wherein at least one location provider is configured to receive information that is wirelessly transmitted from a location that is remote from the vehicle.

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31. The location-aware system of claim 28, wherein multiple location providers are configured to receive information that is wirelessly transmitted from a location that is remote from the vehicle.

32. The location-aware system of claim 28 further comprising at least one hierarchical tree structure resident on the computer-readable media and having multiple nodes each of which being associated with a location, the location service module being configured to determine a vehicle location by accessing the one hierarchical tree structure and traversing at least one of said nodes.

33. The location-aware system of claim 28 further comprising:

a first hierarchical tree structure resident on the computer-readable media and having multiple nodes associated with first locations;
at least one second hierarchical tree structure resident on the computer-readable media and having multiple nodes associated with second locations, at least one node from the at least one second hierarchical tree structure being linked with one node on the first hierarchical tree structure by a link that is configured to enable a complete location to be derived from the first and second locations; and
the location service module being configured to determine a vehicle location by accessing multiple hierarchical tree structures and traversing at least one of each of said multiple hierarchical tree structures.

34. The location-aware system of claim 28, wherein the behavior engine is configured to adjust the behavior of the one or more applications based, at least in part, on user-specific location information.

35. The location-aware system of claim 28, wherein the behavior engine is configured to adjust the behavior of the one or more applications based, at least in part, on user-specific location information that is maintained on the vehicle's computer.

36. The location-aware system of claim 28, wherein the behavior engine is configured to adjust the behavior of the one or more applications based, at least in part, on user-specific location information that is maintained in a data store that is remote from the vehicle in which the computer is mounted.

37. The location-aware system of claim 28, wherein the behavior engine is configured to adjust a behavior of the one or more applications by causing an Internet connectivity application to call only local telephone numbers to establish an ISP connection.

38. A method of operating a vehicle comprising:

receiving location information with a vehicle computer, the location information pertaining to a location of a vehicle in which the computer is mounted;
determining, from the location information and using the vehicle computer, a current vehicle location; and
modifying, with the vehicle computer, a behavior of the vehicle responsive to the current vehicle location.

39. The method of claim 38, wherein the location information comprises user-specific location information.

40. The method of claim 38, wherein the location information comprises user-specific location information, and said receiving comprises receiving the location information from a data store that is remote from the vehicle computer.

41. The method of claim 38, wherein the location information comprises user-specific location information, and said receiving comprises receiving the location information from a data store via the Internet.

42. The method of claim 38, wherein said determining comprises determining the current vehicle location using a software-implemented location service module that can receive location information from multiple different location providers.

43. The method of claim 38, wherein said determining comprises:

accessing at least one hierarchical tree structure with the vehicle's computer, the one hierarchical tree structure having multiple nodes each of which being associated with a location; and
traversing at least one of the nodes to derive the vehicle's location.

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44. The method of claim 38, wherein said determining comprises:

accessing (1) a first hierarchical tree structure resident on the vehicle's computer, the tree structure having multiple nodes associated with first locations, and (2) at least one second hierarchical tree structure having multiple nodes associated with second locations, at least one node from the at least one second hierarchical tree structure being linked with one node on the first hierarchical tree structure by a link that is configured to enable a complete location to be derived from the first and second locations; and
traversing at least portions of the first and second hierarchical tree structures.

45. One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, implement the method of claim 38.

46. A vehicle having a computer that is configured to implement the method of claim 38.

47. A user-aware vehicle comprising:

a computer having one or more processors; and
at least one data store accessible to the computer and being configured to contain user information pertaining to user preferences that are associated with one or more vehicle contexts, the computer being configured to access the one data store, retrieve user preferences, and configure a vehicle in accordance with a user's preferences.

48. The user-aware vehicle of claim 47, wherein said at least one data store is located on the vehicle.

49. The user-aware vehicle of claim 47, wherein said at least one data store is not located on the vehicle.

50. The user-aware vehicle of claim 47, wherein the computer is configured to wirelessly access the one data store.

51. A user-aware vehicle comprising:

a computer having one or more processors; and
at least one data store accessible to the computer and being configured to contain user information pertaining to user preferences that are associated with one or more vehicle locations, the computer being configured to access the one data store, retrieve user preferences, and configure a vehicle in accordance with a user's preferences.

52. The user-aware vehicle of claim 51, wherein said at least one data store is located on the vehicle.

53. The user-aware vehicle of claim 51, wherein said at least one data store is not located on the vehicle.

54. A method of operating a vehicle comprising:

maintaining a data store that contains user preferences associated with one or more vehicle contexts;
accessing the data store;
retrieving from the data store one or more user preferences associated with a vehicle user; and
configuring a vehicle in accordance with the retrieved user preferences.

55. The method of claim 54, wherein said maintaining comprises maintaining the data store on a vehicle.

56. The method of claim 54, wherein said maintaining comprises maintaining the data store remote from a vehicle that is configured in accordance with preferences that are contained in the data store.

57. The method of claim 54, wherein said accessing comprises wirelessly accessing the data store.

58. The method of claim 54, wherein said accessing comprises wirelessly accessing the data store via a computer that is located on a vehicle that is to be configured in accordance with user preferences that are contained in the data store.

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59. The method of claim 54, wherein the user preferences are associated with one or more vehicle locations.

60. One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, implement the method of claim 54.

61. A method of operating a vehicle comprising:

accessing a data store that contains user preferences associated with one or more vehicle contexts;
retrieving from the data store one or more user preferences associated with a vehicle user; and
configuring a vehicle in accordance with the retrieved user preferences.

62. The method of claim 61, wherein said accessing comprises wirelessly accessing the data store.

63. The method of claim 61, wherein said accessing comprises wirelessly accessing the data store via a computer that is located on a vehicle that is to be configured in accordance with user preferences that are contained in the data store.

64. The method of claim 61, wherein said accessing comprises wirelessly accessing the data store via the Internet using a computer that is located on a vehicle that is to be configured in accordance with user preferences that are contained in the data store.

65. One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, implement the method of claim 61.

66. A location-aware system comprising:

a radio having radio station buttons for selecting a radio station;
a computer operably associated with the radio and configured to be mounted in a vehicle, the computer comprising one or more processors and computer-readable media associated with the one or more processors;
one or more applications resident on the computer-readable media and configured to be executed on the one or more processors, one application being configured to map individual radio stations to specific radio station buttons;
one or more location providers operably associated with the computer and configured to provide location information for use in determining a vehicle location;
a location service module configured to receive location information from the one or more location providers and determine a vehicle location; and
a behavior engine operably associated with the computer and configured to, responsive to a vehicle location that is determined by the location service module, cause said one application to map radio stations that are associated with a determined location to individual radio station buttons.

67. The location-aware system of claim 66, further comprising a data store communicatively linked with the computer and configured to hold user preferences that associate radio stations with various locations.

68. The location-aware system of claim 66, further comprising a data store remote from a vehicle in which the computer is mounted and communicatively linked with the computer and configured to hold user preferences that associate radio stations with various locations.

69. The location-aware system of claim 66 further comprising at least one hierarchical tree structure resident on the computer-readable media and having multiple nodes each of which being associated with a location, the location service module being configured to determine a vehicle location by accessing the one hierarchical tree structure and traversing at least one of said nodes.

70. The location-aware system of claim 66 further comprising:

a first hierarchical tree structure resident on the computer-readable media and having multiple nodes associated with first locations;
at least one second hierarchical tree structure resident on the computer-readable media and having multiple nodes associated with second locations, at least one node from the at least one second hierarchical tree

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structure being linked with one node on the first hierarchical tree structure by a link that is configured to enable a complete location to be derived from the first and second locations; and
the location service module being configured to determine a vehicle location by accessing multiple hierarchical tree structures and traversing at least one of each of said multiple hierarchical tree structures.

71. A location-aware vehicle comprising:

a radio having radio station buttons for selecting a radio station;
means for determining a location of a vehicle;
means for ascertaining radio stations that are associated with a determined location; and
means for automatically mapping the ascertained radio stations to the radio station buttons.

72. The location-aware vehicle of claim 71 further comprising means for determining when a vehicle location has changed, said means for ascertaining being configured to ascertain radio stations that are associated with a new location, said means for automatically mapping the ascertained radio stations being configured to automatically map radio stations associated with the new location to the radio station buttons.

73. A method of operating a vehicle comprising:

determining a location of a vehicle using a computer that is mounted in the vehicle;
for a given location, automatically mapping, using the computer, radio station that are associated with the determined location to radio station buttons on the radio.

74. The method of claim 73 further comprising using user-specified preferences to determine which radio stations to map to the radio station buttons.

75. The method of claim 73 further comprising retrieving user-specified preferences from a remote data store, the preferences being used to determine which radio stations to map to the radio station buttons.

76. The method of claim 73 further comprising retrieving user-specified preferences from a remote data store by establishing an Internet connection and then retrieving the preferences using the Internet connection, the preferences being used to determine which radio stations to map to the radio station buttons.

77. The method of claim 73, wherein said determining comprises using at least one hierarchical tree structure that is accessible to the computer, said structure having multiple nodes each of which being associated with a location, the location being determined by traversing at least one of said nodes.

78. One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, implement the method of claim 73.

79. A vehicle having a programmable computer that is programmed with instructions which, when executed by the computer, implement the method of claim 73.

80. A method of operating a vehicle comprising:

determining a location of a vehicle using a computer that is mounted in the vehicle;
for a given location, automatically mapping, using the computer, radio stations associated with user-specified radio station types associated with the determined location to radio station buttons on the radio.

81. The method of claim 80 further comprising accessing a list that associates radio station types, locations and radio station frequencies so that the radio stations can be mapped to the radio station buttons.

82. The method of claim 80 further comprising accessing a list that is resident on the computer that associates radio station types, locations and radio station frequencies so that the radio stations can be mapped to the radio station buttons.

83. The method of claim 80 further comprising accessing a list via the Internet with the computer, the list associating radio station types, locations and radio station frequencies so that the radio stations can be mapped to the radio

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station buttons.

84. The method of claim 80, wherein said determining comprises using at least one hierarchical tree structure that is accessible to the computer, said structure having multiple nodes each of which being associated with a location, the location being determined by traversing at least one of said nodes.

85. One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, implement the method of claim 80.

86. A vehicle having a programmable computer that is programmed with instructions which, when executed by the computer, implement the method of claim 80.

87. A location-aware system comprising:

a computer comprising one or more processors and computer-readable media associated with the one or more processors;
one or more applications resident on the computer-readable media and configured to be executed on the one or more processors;
one or more location providers operably associated with the computer and configured to provide location information for use in determining a vehicle location;
a location service module configured to receive location information from the one or more location providers and determine a vehicle location by using at least one hierarchical tree structure resident on the computer-readable media and having multiple nodes each of which being associated with a location, the location service module being configured to determine a vehicle location by accessing the one hierarchical tree structure and traversing at least one of said nodes; and
at least one of said one or more applications being configured to provide a user with information that is associated with the vehicle's location as determined by the location service module.

88. The location-aware system of claim 87, wherein the information that is provided to the user is associated with one or more user-specified preferences.

89. The location-aware system of claim 87, wherein the location service module determines a vehicle location by using multiple hierarchical tree structures each of which having multiple nodes that are associated with locations.

90. A vehicle embodying the location-aware system of claim 87.

91. A method of operating a vehicle comprising:

receiving, with a vehicle-mounted computer, location information pertaining to a location of a vehicle;
accessing at least one hierarchical tree structure, using the vehicle-mounted computer, the structure having multiple nodes each of which being associated with a location;
using location information to identify a node on the at least one hierarchical tree structure;
traversing multiple nodes of the at least one hierarchical tree structure to derive a vehicle location; and
responsive to a derived vehicle location, providing a user of the vehicle with information associated with the derived location.

92. The method of claim 91, wherein said providing of the information to the user comprises providing information that is associated with user-provided preferences.

93. One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, implement the method of claim 91.

94. A vehicle having a computer that is programmed with instructions that implement the method of claim 91.

95. A method of operating a vehicle comprising:

collecting user preferences that pertain to a user-desired experience associated with operation of a vehicle;
storing the user preferences in a computer-accessible location;

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authenticating a user to a vehicle;
retrieving the authenticated user's preferences from the computer-accessible location using a computer that is mounted in a vehicle that the user is to operate; and
configuring the vehicle in some manner in accordance with the user's preferences.

96. The method of claim 95, wherein said storing comprises locally storing user preferences on the computer.

97. The method of claim 95, wherein said storing comprises storing user preferences at a location that is remote from the vehicle.

98. The method of claim 95, wherein said storing comprises storing user preferences at a Internet-accessible location that is remote from the vehicle, and said retrieving comprises retrieving the user's preferences over the Internet.

99. One or more computer-readable media having computer-readable instructions thereon which, when executed by a computer, implement the method of claim 95.

100. A method of operating a vehicle comprising:

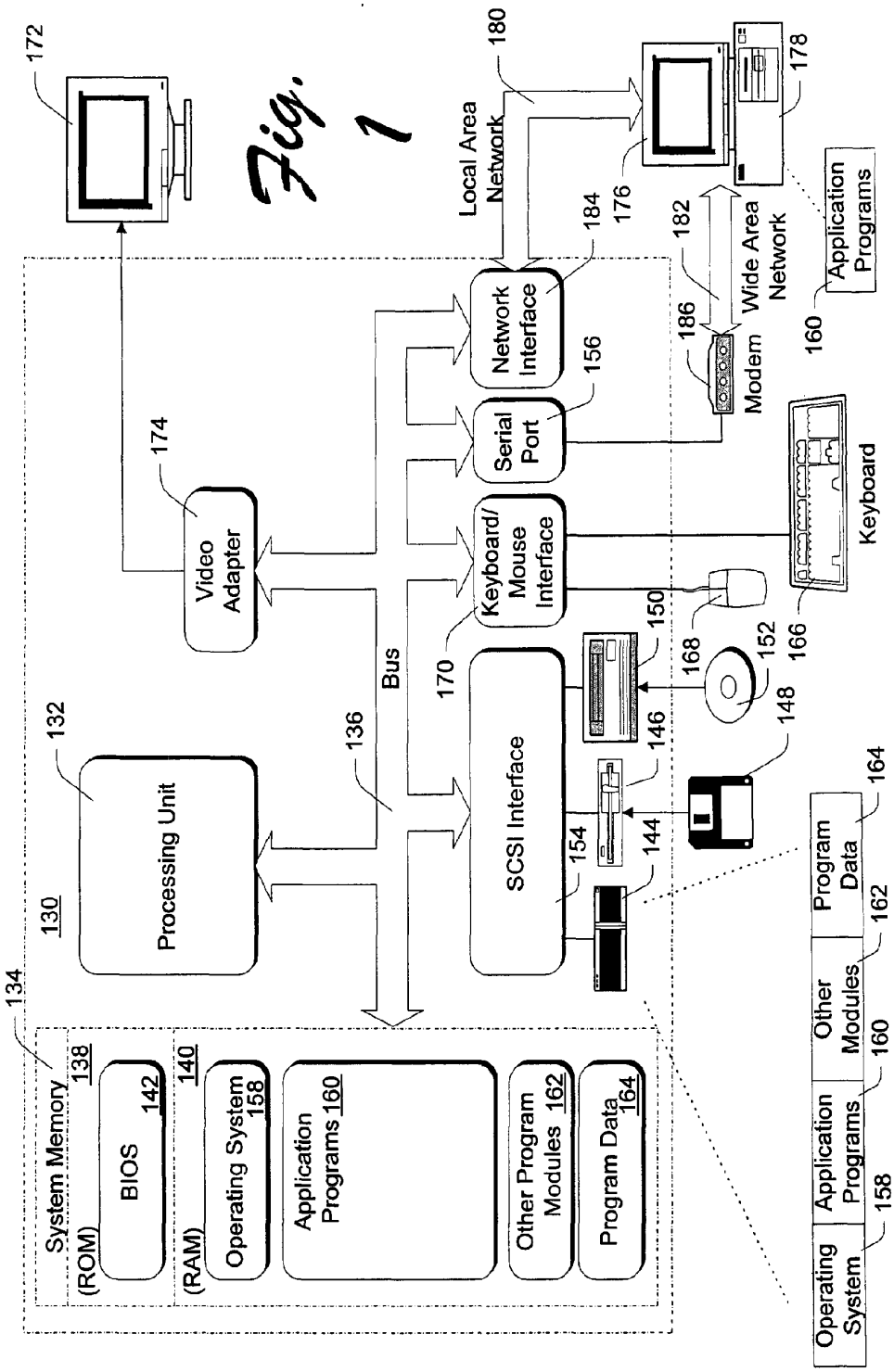
authenticating a user to a vehicle that has an onboard computer;
retrieving preferences for the authenticated user from a computer-accessible location using the onboard computer; and
configuring the vehicle in some manner in accordance with the user's preferences.

101. The method of claim 100, wherein said retrieving comprises retrieving the preferences from a location that is remote from the vehicle.

102. A vehicle configured to implement the method of claim 100.

103. A rental vehicle configured to implement the method of claim 100.

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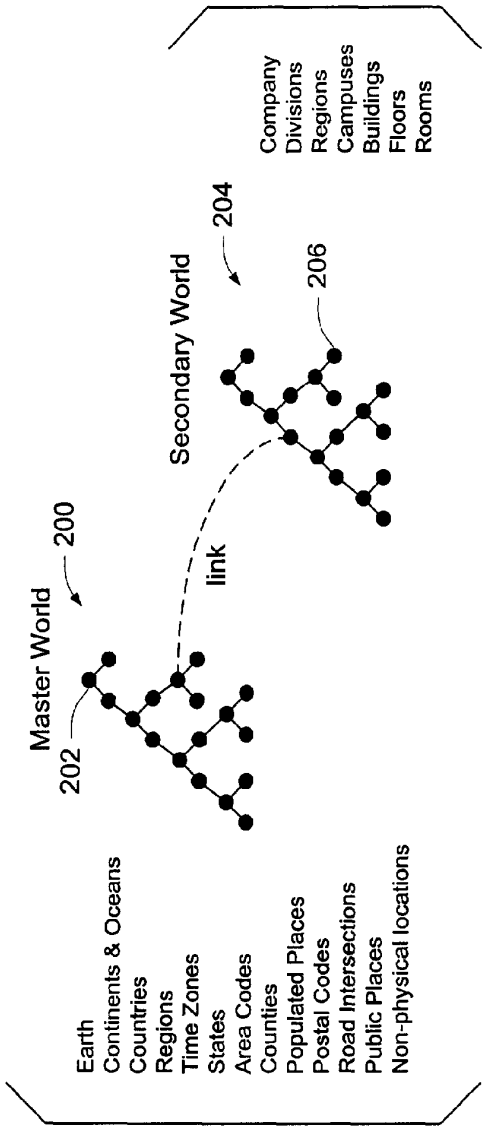


Fig. 2

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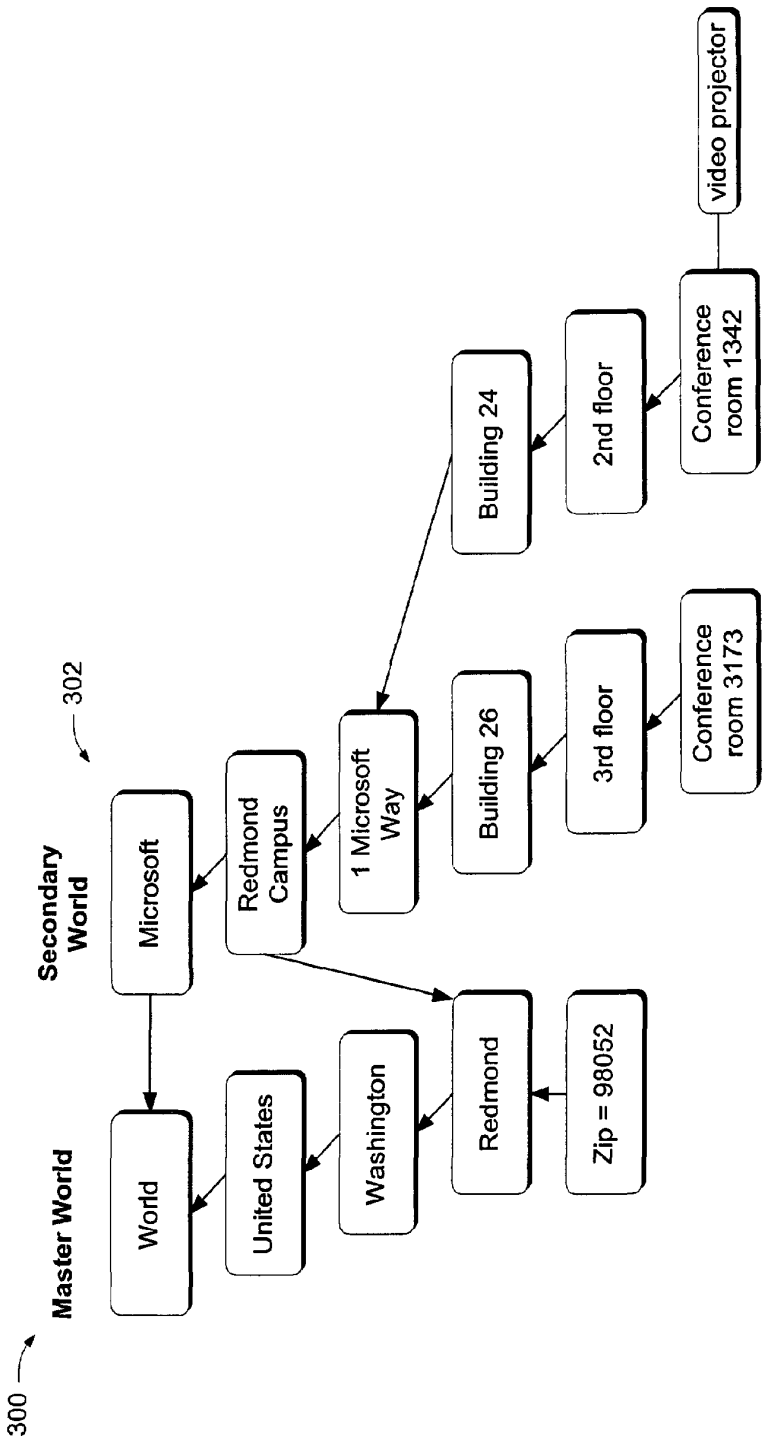


Fig. 3

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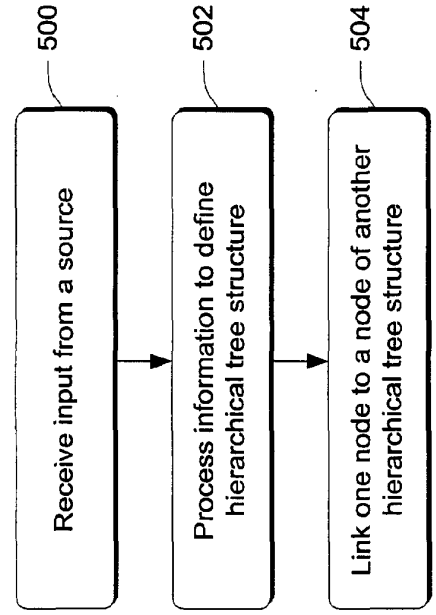


Fig. 5

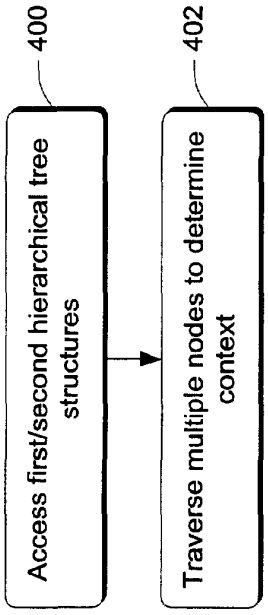


Fig. 4

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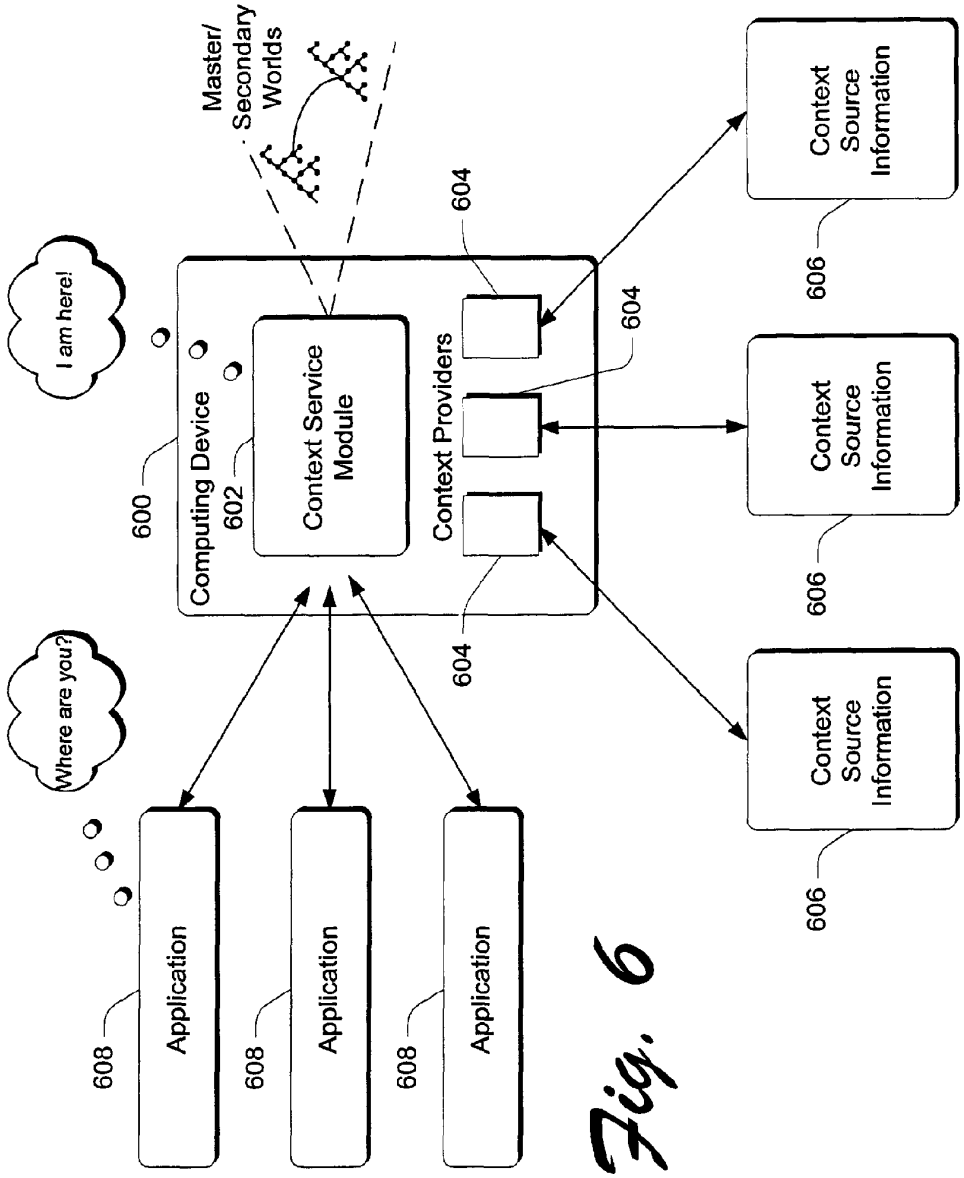


Fig. 6

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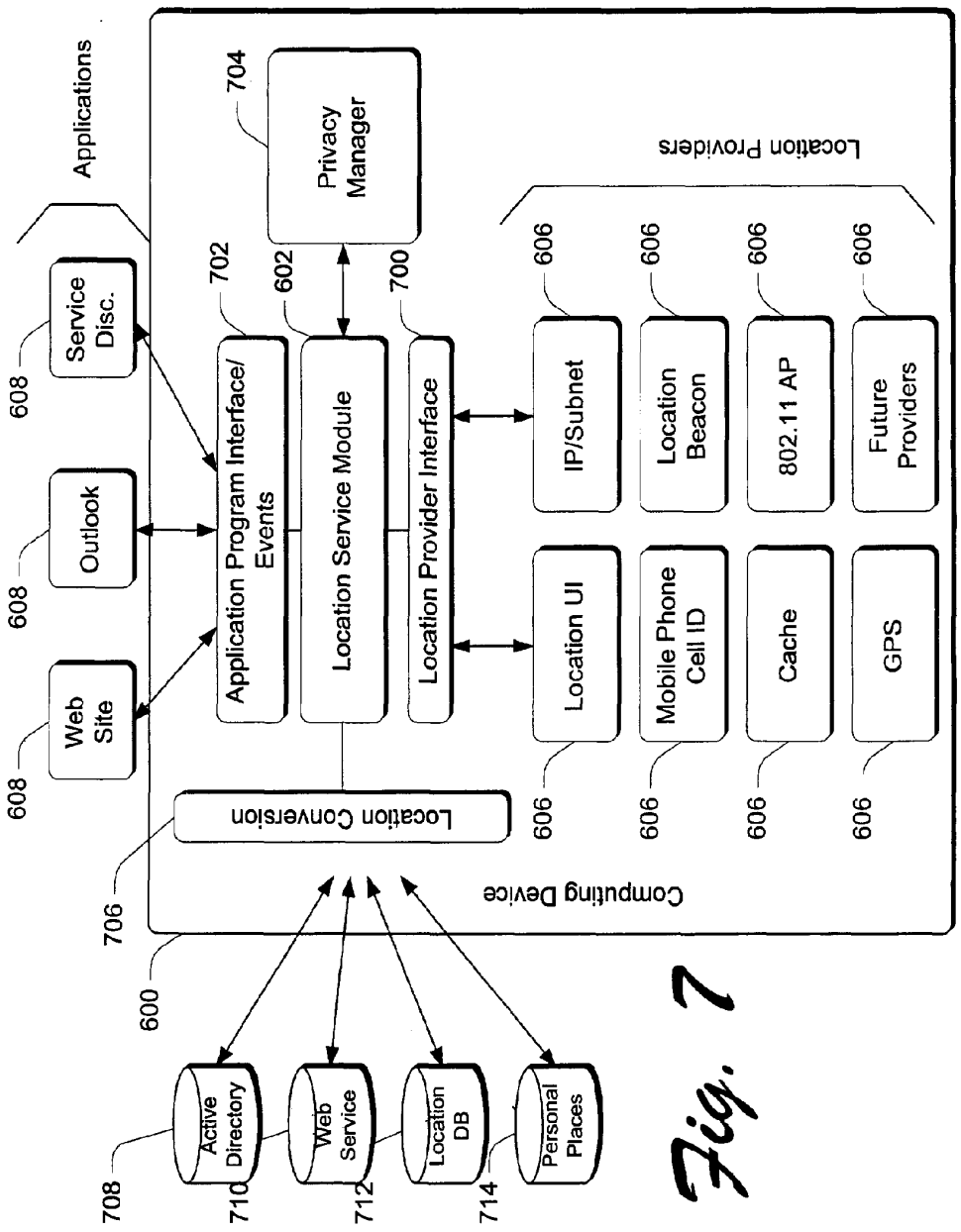


Fig. 7

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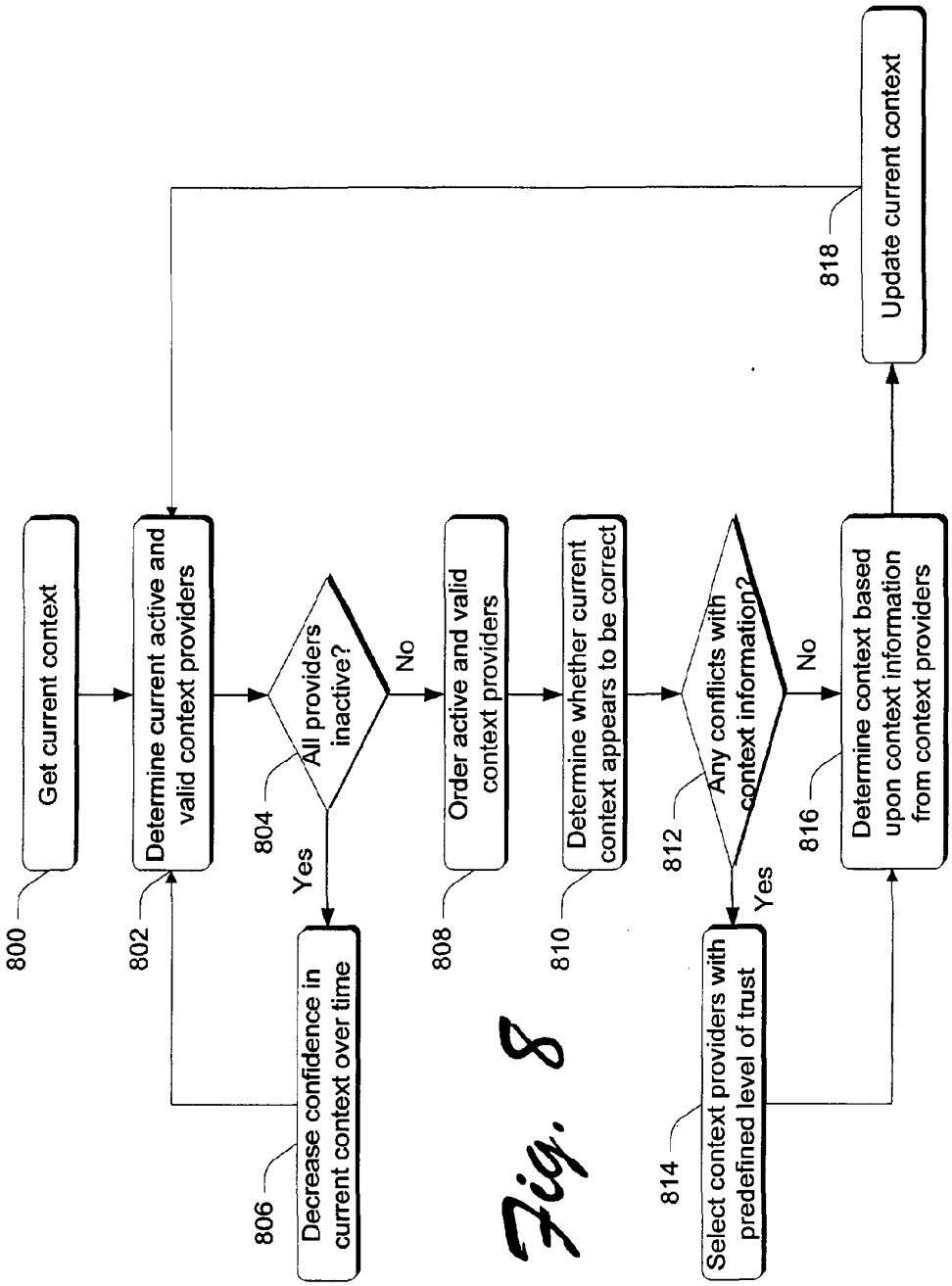


Fig. 8

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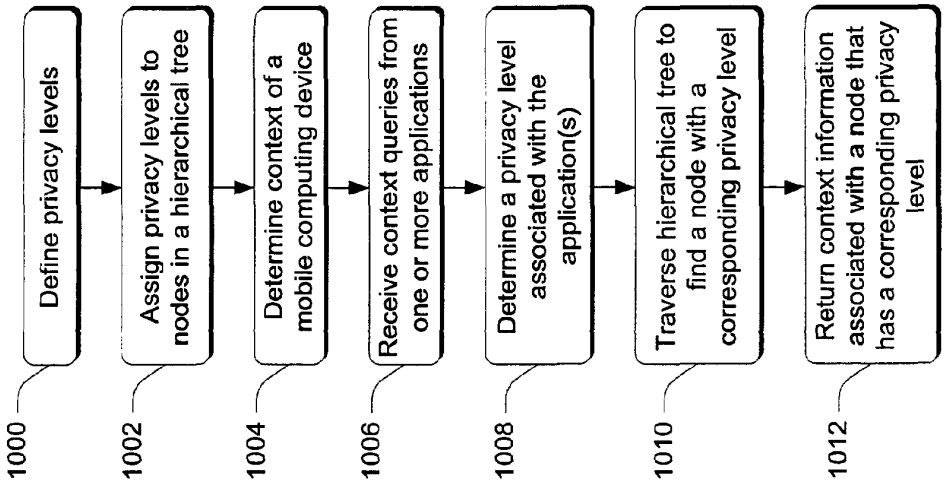


Fig. 10

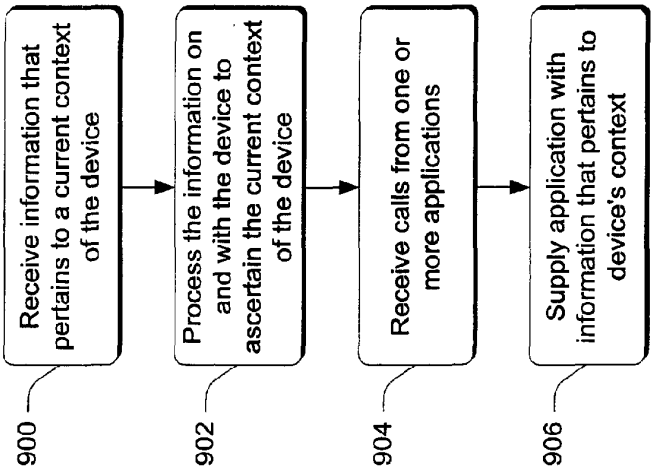


Fig. 9

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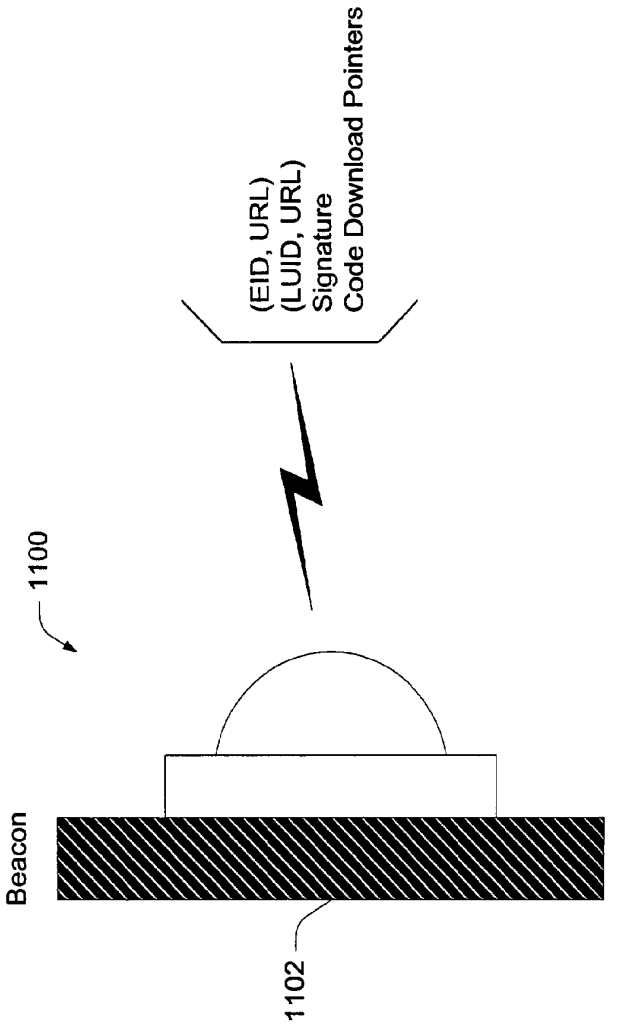


Fig. 11

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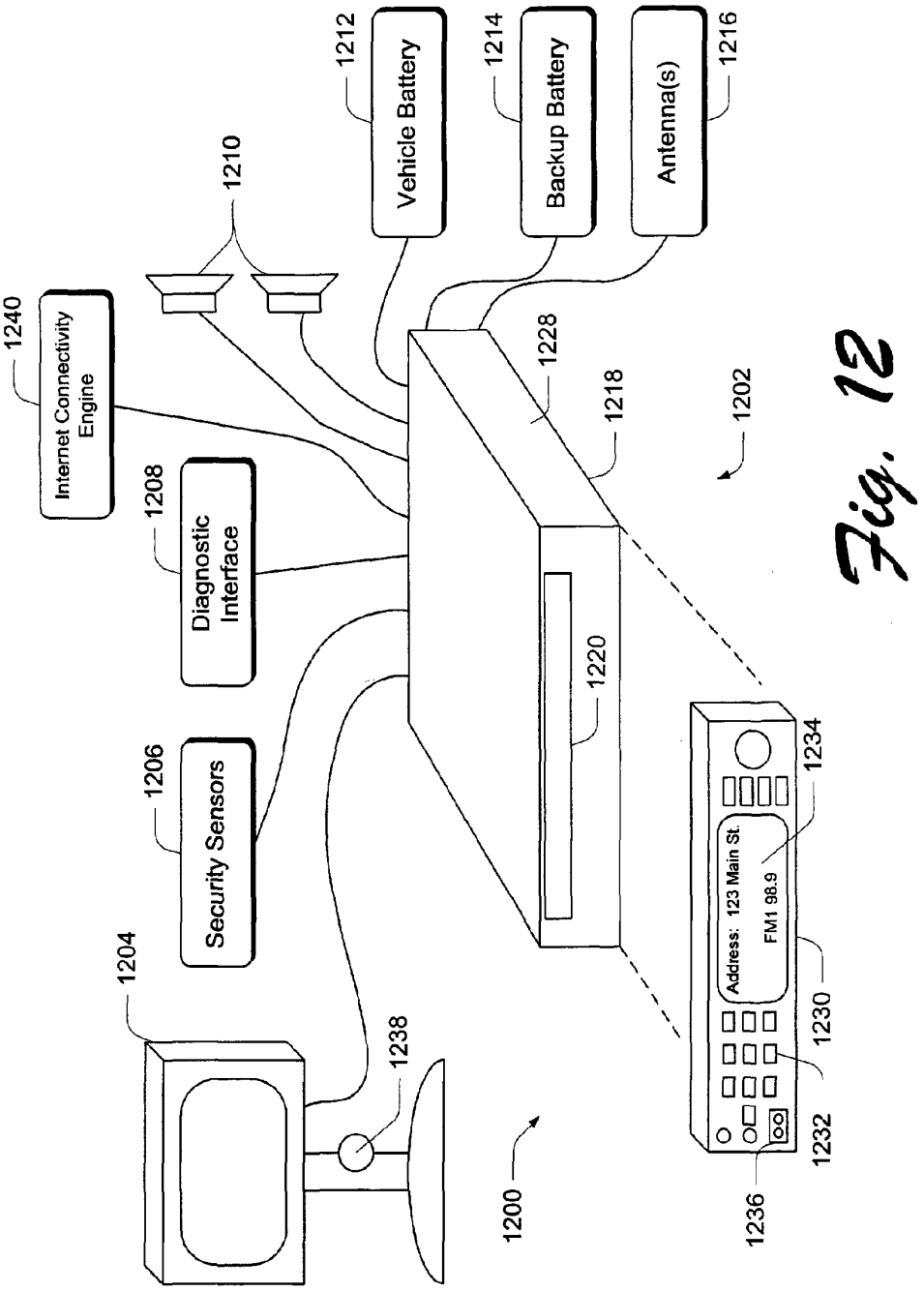


Fig. 12

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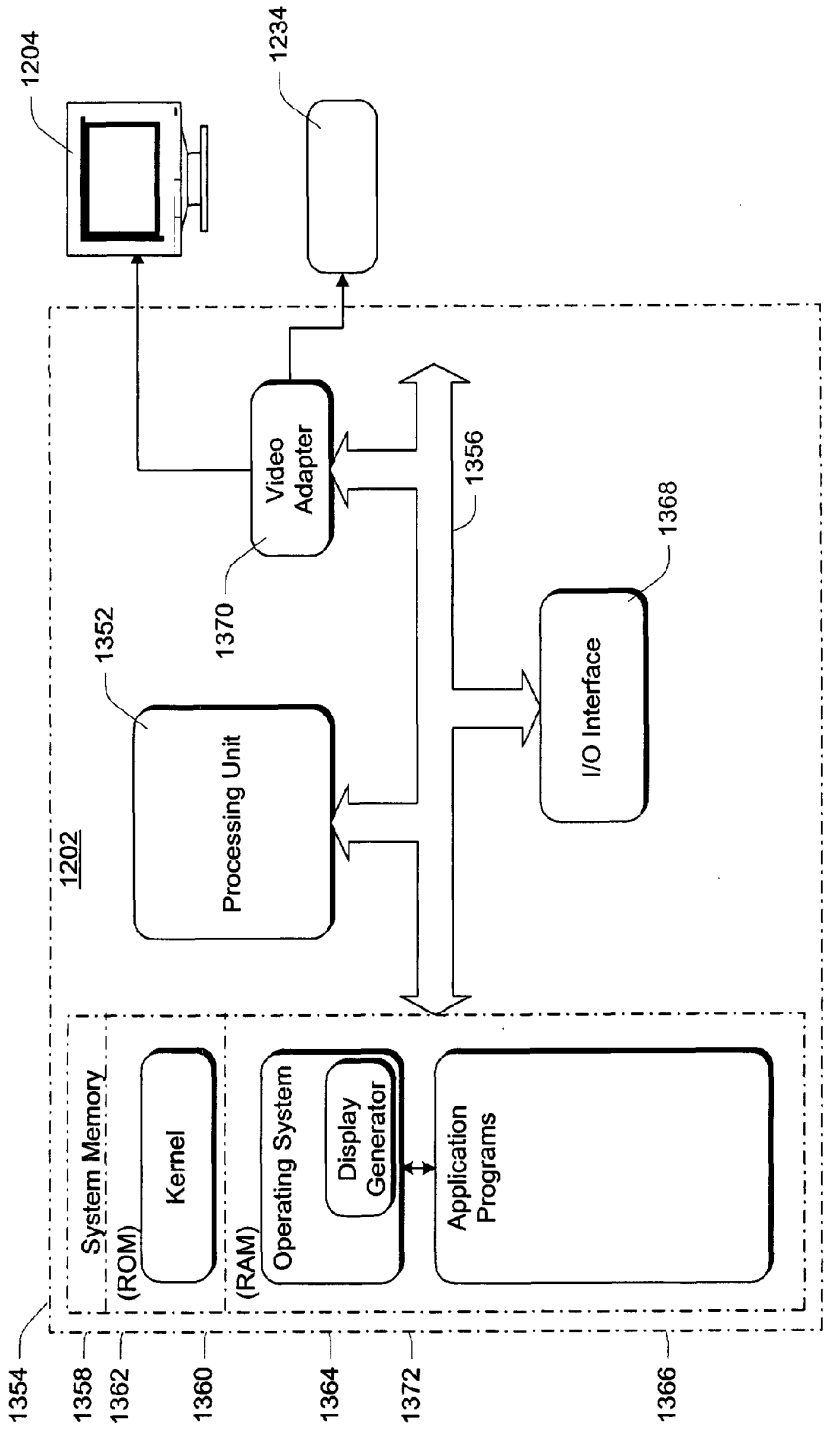
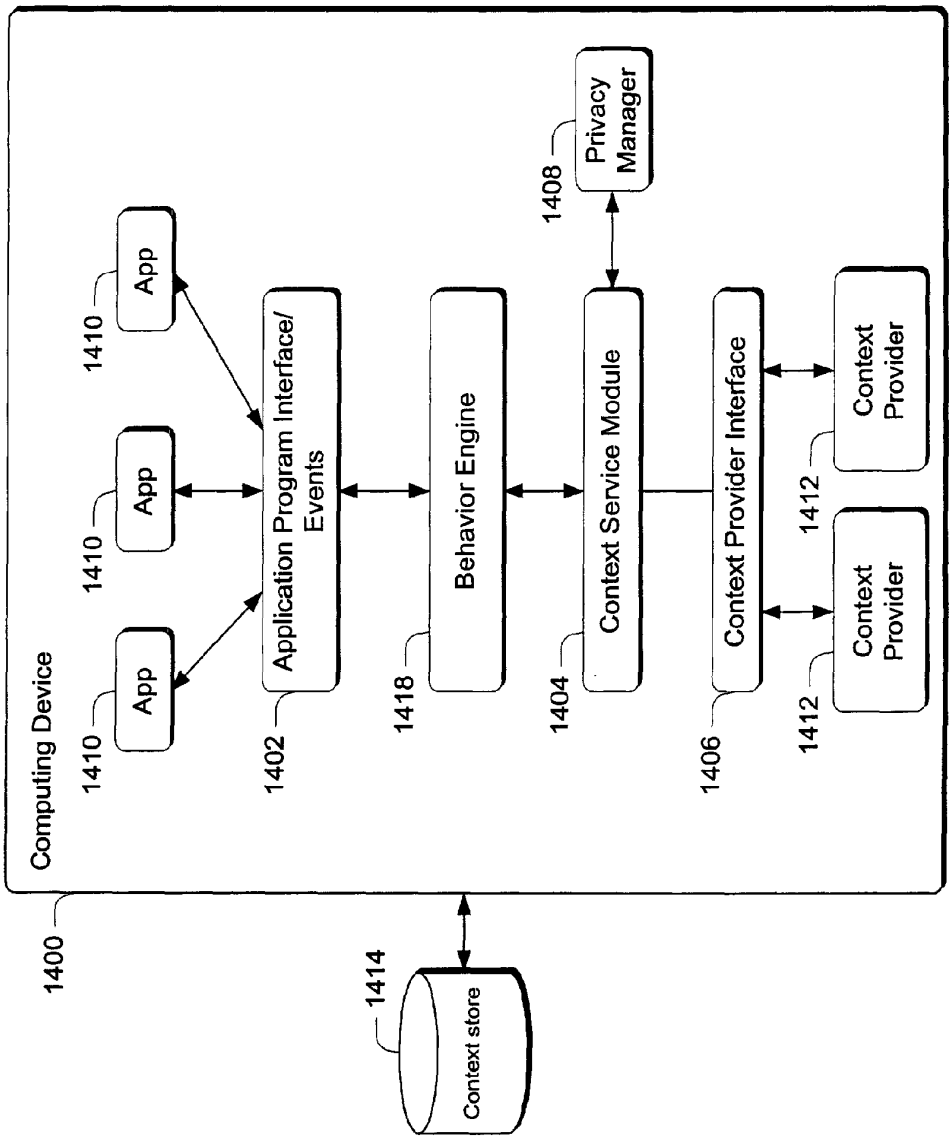


Fig. 13

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Fig. 14



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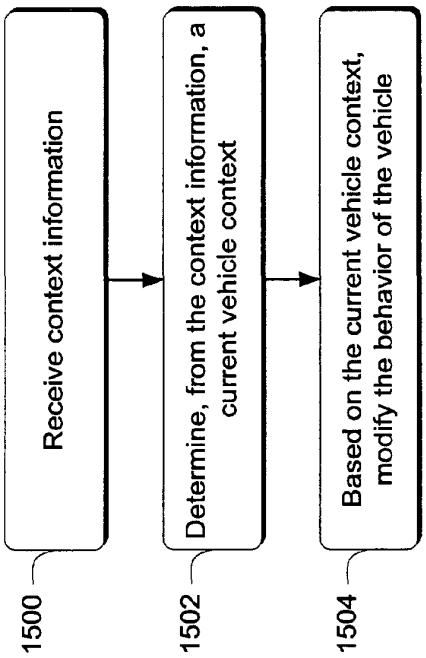
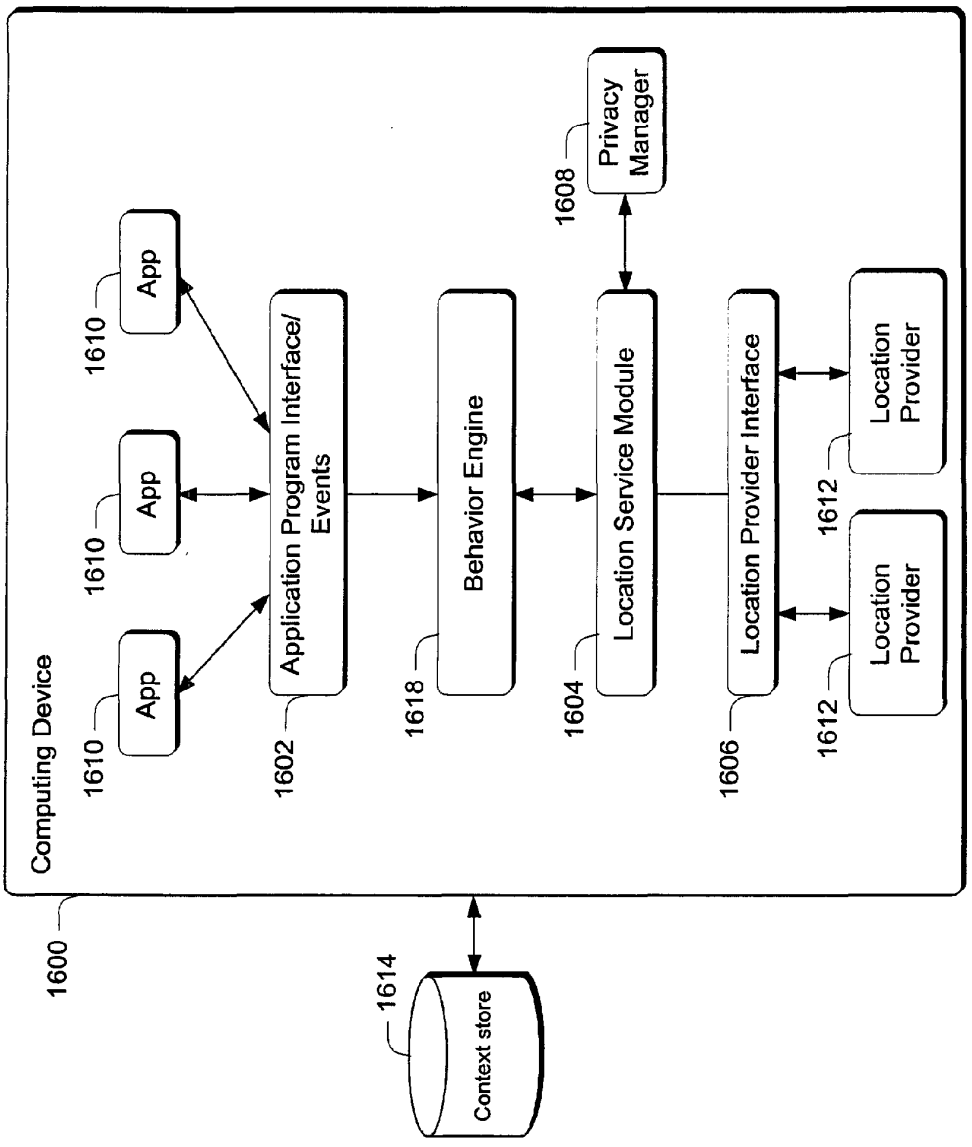


Fig. 15

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Fig. 16



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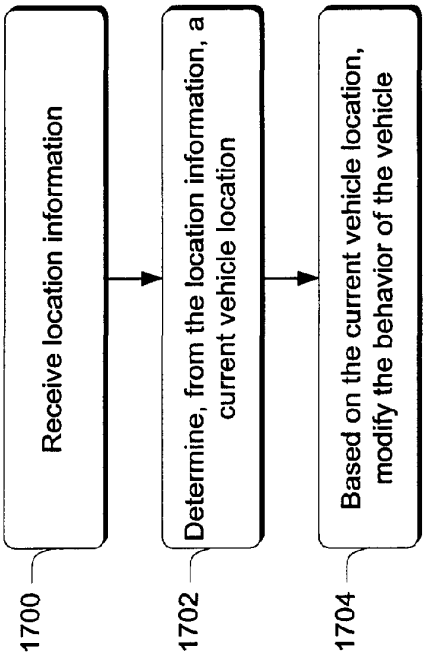


Fig. 17

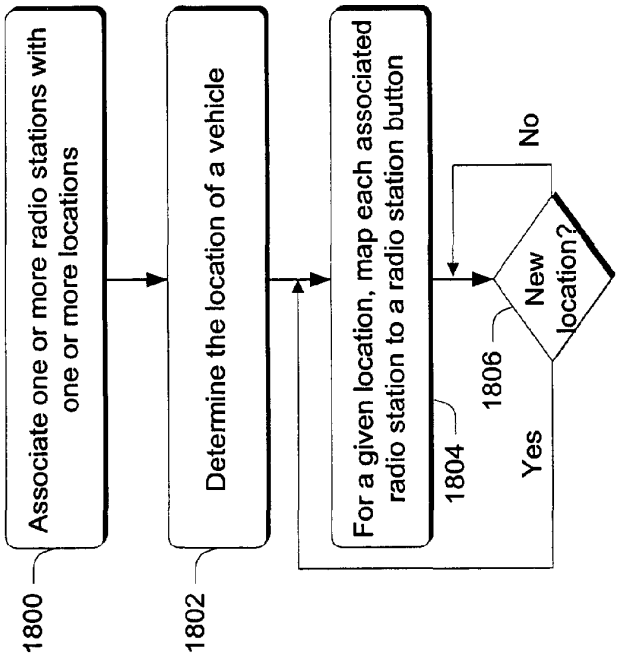


Fig. 18

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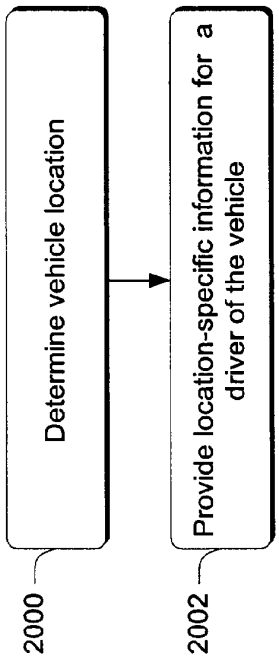


Fig. 20

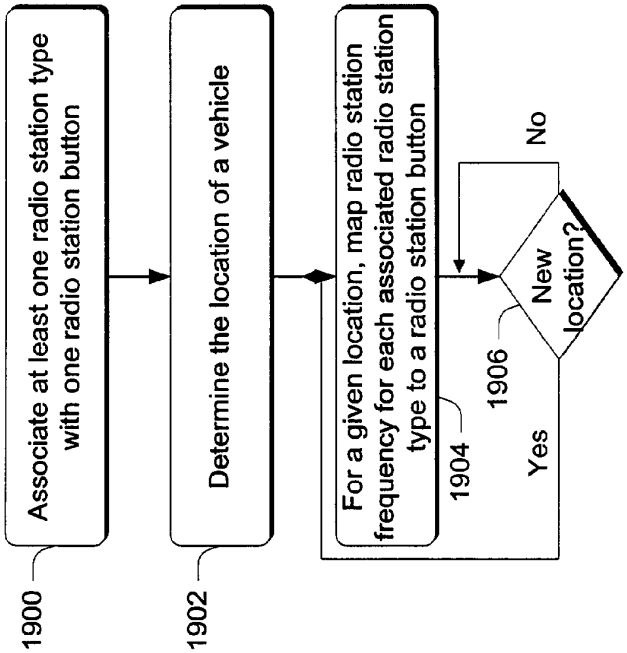


Fig. 19

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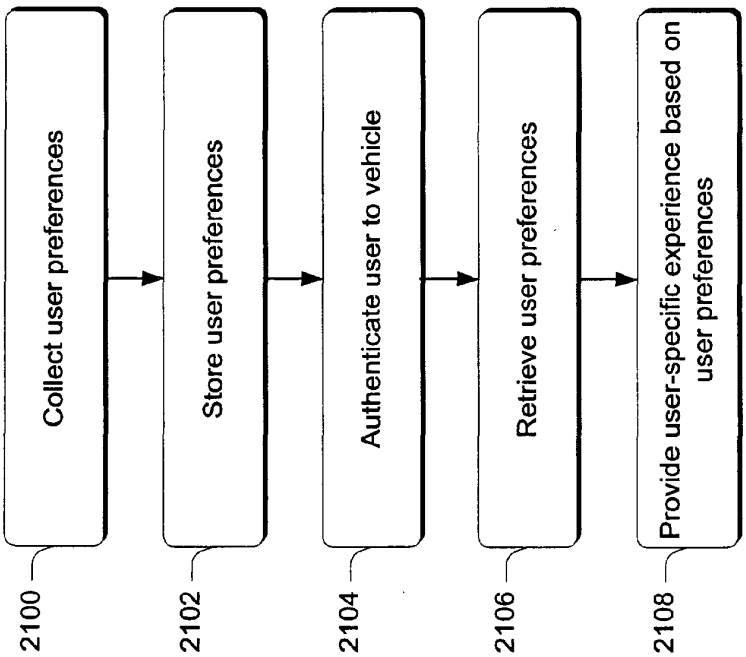


Fig. 21

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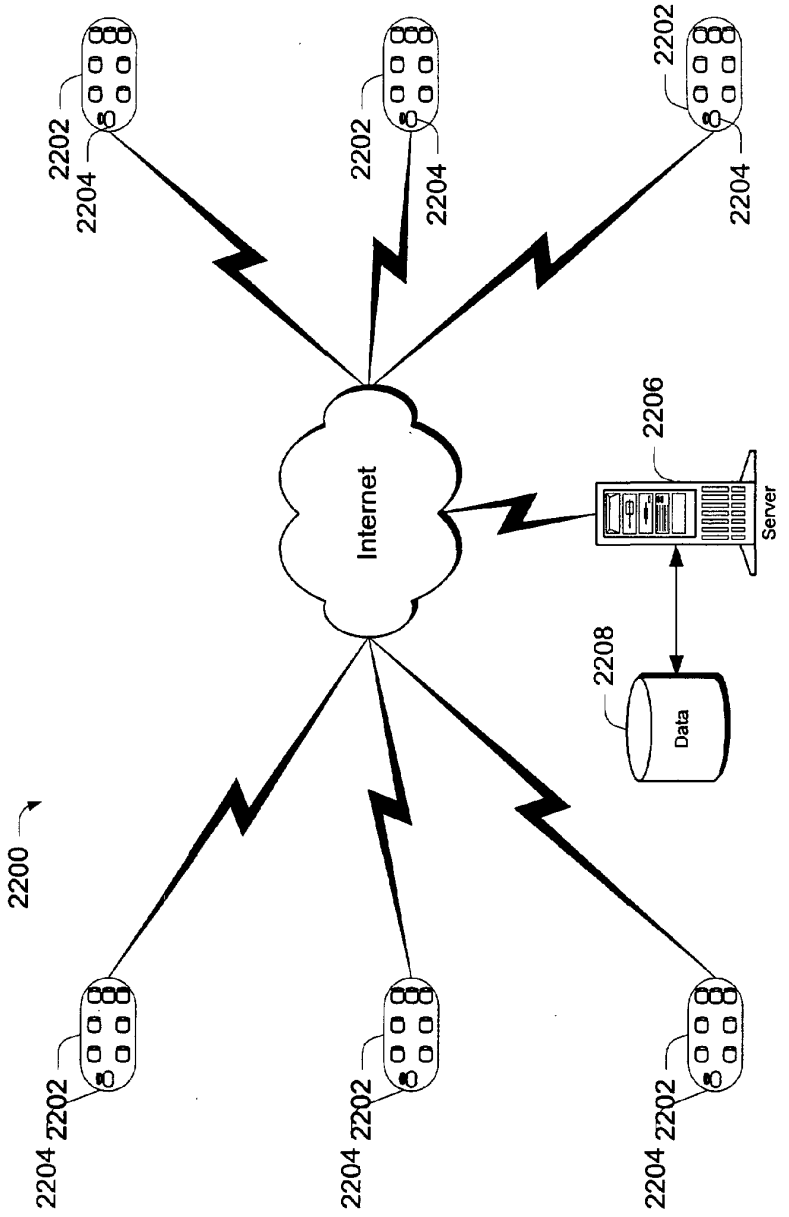


Fig. 22

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(54) Title: A SYSTEM FOR PROCESSING CONTEXT DATA

(57) Abstract: A system (300) for processing context data comprising means for receiving context data (304,308,402,404,406) from a plurality of sources (302); means for producing context information (310,312,314,316) from the received context data according to a predetermined rule-set including a plurality of rules; and means for communicating (308,316,400,404,406) the context information to at least one application, wherein the system (300) includes means for permitting at least one protocol-source (302,304,404) to specify instructions and/or rules related to a communication protocol for communication between the protocol-source and the system, thereby updating the means for receiving (304,308,402,404,406) and/or the means for communicating (308,316,400,404,406). The system (300) further includes means for permitting at least one rule-source (302,304,402) to specify at least one rule thereby updating the rule-set, wherein the rule-source (302,304,402) specifies rules for filtering and/or formatting the context data and rules for producing context information from context data. The system (300) is used in a network (Fig. 4) for processing context data. One or more systems (300) are implemented on a wireless apparatus (102).

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A System for Processing Context Data

The invention relates to a system for processing context data, which is related to the environment, to notify applications when a particular condition is met. The system may be implemented in a portable wireless apparatus and included in a network for processing context data for use with a work management system.

Background

Knowing a computing device's context can be useful in providing services based on time and location. In a simple example, a computing device may receive location data from a Global Positioning Satellite (GPS) receiver. This data is usually referred to as context data. An application may use this context data to determine the location of a user and provide a useful service based on that location.

To provide these useful services, the hardware (e.g. GPS receiver) or software providing context data is typically called a context source, hereinafter referred to as a source, which measures an aspect of its environment (its context) to produce context data. Many applications have been written that use context data as in the Cyberguide and GUIDE projects [Gregory D. Abowd et. al., *"Cyberguide: A Mobile Context-Aware Tour Guide"*, Wireless Networks, 3(5):421-433, October 1997] [Nigel Davies et. al., *"Caches in the Air: Disseminating Tourist Information in the GUIDE System"*, in WMCSA, New Orleans, Louisiana, IEEE Computer Society Press].

These projects have produced applications, which have context-aware features, that reside in portable units providing location or time based services. For example, the units can act as tour guides for interactively guiding tourists around tourist sites or cities. Although they provide interactive services, their context aware features are not re-configurable, without a large investment in re-design, if additional new sources providing new context data are required.

On the other hand, systems for processing context data have been designed that produce context information, based on context data, according to predefined business

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rule-sets whereby the context information can be distributed to applications requesting it. A simple example of context information based on context data such as the location and time data obtained from a GPS receiver could be information like *"the technician has stayed at the same location for 30 minutes"* or *"the user is now late"*, which is sent to the application in an appropriate format. An application requesting and receiving such information may then use it accordingly to provide a location based service, for example, automatically optimising/updating a field engineer's schedule, controlling the deployment of an organisation's workforce, or showing a user nearby shops that are open or likely to be of interest.

These systems have prompted software developers to implement applications with context aware features by using predefined software toolkits for providing context data support, for example the software library called the *"Context Toolkit"* [Anind K Dey, *"Providing Architectural Support for Building Context-Aware Applications"*, PhD Thesis, November 2000, Georgia Institute of Technology].

However, it has been frequently reported that the systems and applications developed to work with these software toolkits cannot fully satisfy the aims of:- being hardware, operating system, and programming language independent; or adequately providing for improved capabilities of maintenance and evolution; and fully sharing additional sources, processing power, context data and services [Jason I Hong and James A Landay, *"An Infrastructure Approach to Context-Aware Computing"*, Human Computer Interaction, 16 (2,3 & 4), 287-303, 2001].

US 2004/0111397 A1 and EP 1217857 A2 disclose systems for processing context data that receive context data from numerous sources and send context information to numerous applications.

The system disclosed in US 2004/0111397 A1 focuses on fusing context data for use by applications. Context data from similar sources are grouped together and then aggregated. For each group, a single context value and single quality value is computed to reduce the likelihood of ambiguous context information.

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In EP 1217857 A2, a system for processing context data is applied to control various applications within a vehicle depending on the user's and/or vehicle's context. Once the context is determined, a set of policies is executed and then enforced. This technique has been extended in US 2002/0124067 A1 for use in portable devices, such as laptops, where the enterprise policies are executed on a laptop depending on a user's location. The policies may control access to electronic files when a user moves location, for example.

However, although these systems communicate with sources and applications having context aware features, the communication is only provided by hard-coded application programming interfaces (API). This severely limits these systems to only those sources and applications that have been written specifically to communicate with them. These systems also use their own procedures for the flow of context data and context information. Thus the APIs, and hence both disclosed systems, need to be redesigned should additional "non-conforming" or proprietary sources, or "non-conforming" or proprietary applications supporting context aware features be required.

If additional rules for producing additional context information from context data are to be added to the abovementioned systems, the systems have to be redeveloped, for example, by rewriting and recompiling the software.

In addition, the aforementioned systems were attempts at standardising sources and the communication functions with applications that provide context aware features. However, for each organisation that requires applications that provide context aware features, context data related to various sources may be collected differently, for different reasons, in different formats, from different types of computing devices, using different communication protocols. As context aware computing matures, developers and organisations requiring context aware features are faced with a costly hurdle in updating their systems to overcome the prevalent use of, or need for, additional, non-standardised, or legacy sources and applications.

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Aspects of the invention are set out in the accompanying claims.

In a further aspect of the invention, a system for processing context data is provided which includes means for receiving context data from a plurality of sources; means for producing context information from the received context data according to a predetermined rule-set including a plurality of rules; and means for communicating the context information to at least one application, wherein the system further includes means for permitting at least one protocol-source to specify a new communication protocol for future communication between the system and the protocol-source thereby updating the means for receiving and communicating. The new communication protocol is dynamically provided during runtime of the system.

Entities such as sources (context data sources), means for collecting context data, and applications or components thereof can act as protocol-sources by providing the functionalities to specify and communicate new communication protocols. Examples of applications facilitating the communication of new communication protocols are directory service applications or applications with context aware features. The ability of protocol-sources to communicate new communication protocol information to the system allows additional applications or sources to be incorporated into the system to update the means for receiving and communicating context data and context information without the need for redevelopment. This provides the added functionality of the system handling additional, non-standard or legacy sources and applications. The new communication protocol information, which may further include new code that implements the new communication protocol, can be loaded into system memory dynamically during system runtime allowing the system to remain operational.

The system may further include a protocol registry for storing the new communication protocols. In addition, the new entities such as sources, means for collecting context data or applications, (acting as protocol-sources) transmit new code that performs an implementation of the communication protocol, which can be

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stored in the protocol registry. This dynamically provides the system with the appropriate communication protocol and code implementing the communication protocol that specifies how the system should communicate with each entity. The necessary programs or links thereto, for implementing that entities communication protocol are further provided. This allows protocol implementations such as executable files, for example the *inetd* program, standard communication protocols such as the transmission control protocol/internet protocol (TCP/IP), or custom communication protocols and protocol implementations, to be incorporated into the system dynamically and during runtime.

The code that performs the implementation of the communication protocol may be given in a platform independent format, such as byte-code format or interpreter based formats like XML. This allows the system to be hardware, operating system, and programming language independent and provides the capability of future maintenance and evolution without costly redevelopment of the system.

In addition, the protocol registry allows the communication protocols communicated by the entities (acting as protocol-sources) to be stored in a secure place such as a central server. This provides added security ensuring the system for processing context data has access to legitimate sources and applications.

In another aspect of the invention, a system for processing context data is provided which includes means for receiving context data from a plurality of sources; means for producing context information from the received context data according to a predetermined rule-set including a plurality of rules; and means for communicating the context information to at least one application, wherein the system further includes means for permitting at least one rule-source to specify at least one rule, that can be dynamically provided during run-time, thereby updating the rule-set, wherein the rule-source specifies rules and/or rule related data for filtering and/or formatting the context data.

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The rule-sources can be, among other things, context data sources, applications with context aware features, or other applications acting as facilitators for the provision of rules and/or rule related data. As the rule-source specifies rules and/or rule related data for filtering and/or formatting the context data, this allows the system to handle rule-sources that provide uniquely formatted context data. The rule-source specifies additional rules and/or related data to add to the rule-set, the rules of additional or updated applications and/or sources are then incorporated into the system without the need for recompiling or redevelopment of the system. That is, these rules and/or related data can be loaded into system memory dynamically while the system is in operation, or in system runtime.

Preferably, the rules determined by the rule-source further include rules for producing context information from context data. This allows applications with context aware features to provide additional rules for processing context data into context information. The rules specified by the rule-source may further relate to either the receipt by the system of context data or to the processing of context data to produce context information.

Where the rule-source determines a rule and/or related data for receiving context data, additional sources that provide context data can be handled by the system. This allows the system to be updated to deal with the format of the context data of additional sources dynamically by specifying, for example, the manner in which the context data is to be filtered and/or formatted to enable processing the context data.

The system may further include at least one registry for storing rules specified by the rule-source. This may include a first registry for storing rules for filtering and/or formatting context data and a second registry for storing rules for producing context information. The first registry also stores rules and related data for formatting/filtering context data that are further provided by sources (context sources) and/or applications facilitating a directory service. The second registry also stores rules and related data for operating on formatted context data further provided by applications with context aware features. In addition, applications with context

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aware features may provide further rules and related data for handling rules and/or data related to requests of context information that are stored in the second registry.

By providing registries, the additional rules and/or related data, which are required when additional sources and applications are added or removed from the system, will update the system without the need for redeveloping or redeploying the system. A registry system can provide further mechanisms for the validation of legitimate sources providing context data ensuring the reliability and security of the system.

The system for processing context data may include means for notifying the application when a predetermined requirement or one or more rule conditions are met. This allows the system to be dynamically configured to notify an application when one or more conditions are satisfied when context data is processed. The system may further include an interest registry for storing the rules that determine the predetermined requirements of the applications.

The predetermined requirement can be at least partly determined by the rules and/or rule related data specified by the rule-source, where these rules can further be additional rules related to requests for context information, or data related to requests for context information. Applications can specify rules and/or data relating to requests for context information during system runtime.

Where the rule-source specifies a rule for the processing of context data to produce the context information, the system can incorporate the additional rules, which implement the notification of an application's request for context information. This can be done dynamically and without the need to redevelop the engine.

In further aspects of the invention, the system for processing context data may include means for collecting context data. Preferably, the system also includes means for translating the context data provided by the sources and for providing the context data to the system. The translating means may be a wrapper program. This

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allows sources not specifically designed to operate with the system to be dynamically added to the system without the need to rewrite the system.

The collecting means and/or translating means may be incorporated into a hardware or software sensor, which can also be a component of a source or application. This allows for the provision of improved maintenance and evolution capabilities and the ability to share sources, sensors and context data.

A network for processing context data which includes at least one system for processing context data with any combination of the features as described above, a plurality of data sources for supplying context data to at least one of the systems for processing context data and a plurality of applications for receiving context information from at least one of the systems in the network.

The network including at least one wireless device with at least one of the systems for processing context data installed. The network may further include at least one data source (e.g. context data sources) and/or at least one of the applications being implemented on the wireless device. Alternatively, the data source may be implemented on an additional external device. In conjunction with applications like work management systems, this network can provide for the efficient deployment of an organisation's workforce.

Preferred features of the present invention will now be described, purely by way of example, with reference to the accompanying drawings, in which: -

Figure 1 illustrates a symbolic representation of a system for processing context data.

Figure 2 illustrates the communication manager of the system of Figure 1.

Figure 3 illustrates the interest registry of the system of Figure 1.

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Figure 4 illustrates a preferred embodiment of a network for processing context data using the system of Figure 1 for use with a work management system.

Figure 5 illustrates a preferred embodiment of a wireless apparatus for use in the network of Figure 4.

Specific Description of the Preferred Embodiments

A symbolic representation of a system **300** for processing context data is shown in Figure 1. A brief overview of the system **300** is now given followed by a detailed description of its components. The system **300** communicates with a plurality of context data sources **302**, hereinafter referred to as sources **302**, which provide context data to the context repository **312** by means of the communication manager **308**, event filter **310** and ontology registry **318**. The system **300** includes instructions and/or rules and related data relating to communication protocols for communication between the sources **302** and the communication manager **308** either by means of sensors **304**, applications or otherwise.

The system **300** notifies an application (not shown) when a particular requirement is met. The particular requirement is calculated by the system **300** based on a rule-set. The rule-set includes rules and related data for formatting and/or filtering the context data performed in the event filter **310**, which refers to the ontology registry **318**. The rule-set also includes rules and related data for requests of context information given by applications (the particular requirements of the applications) which communicate with the system **300** via the communication manager **308**, interest registry interface **324**, rule registry interface **322** and interest registry **316**. The rule-set also includes rules and related data for calculating context information from the context data in the rule engine **314**.

The primary functionality of the system **300** is:- receiving context data collected by sensors **304** that act as interfaces between the sources **302** and the communication manager **308**; task progress reasoning or context data processing being performed by the interaction of the system's **300** event filter **310** and rule engine **314**; and the

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interfacing with external systems or applications (not shown) being performed by the interaction of the interface **324**, communication manager **308**, interest registry **316** and rule engine **314**.

Initially, context data and applications having context aware features are first defined, during the design stage, by an organisation as a system specification. The required sources **302** and sensors **304** can also be defined within the system specification. As will be described, the system **300** for processing context data can be dynamically updated when additional or upgraded sources **302**, sensors **304**, and applications are required.

Entities such as sources **302**, sensors **304** and applications need to have the functionalities of specifying new communication protocols or rules, which is they act as protocol-sources and/or rule-sources. When the entities have the functionalities of acting as protocol-sources, they will typically register new communication protocols and/or code performing an implementation of the new communication protocols with the system **300**. This enables communication between the entities and the system **300,** to be described in more detail with reference to Figures 1 and 2.

When the entities have the functionalities of acting as rule-sources, they will typically register rules and/or data, such as rules and data relating to:- the formatting and/or filtering of context data; the processing of context data to produce context information; and requests for context information. This enables the system **300** to process context data and to distribute context information dynamically, to be described in more detail with reference to Figures 1, 2 and 3.

Referring to Figure 1, context data is collected from sources **302** by the sensors **304**. The communication between the system **300** and a sensor **304** is performed via methods depending on the implementation platform of the sensor **304**. The method of communication by the system **300** with sensors **304** and applications will be discussed in more detail in Figure 2.

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The system **300** can be implemented on a computing device, which typically includes one or more processors, computer-readable media, for example, hard disk and/or floppy disk drives other storage media and memory, and software executable on the one or more processors that cause the processors to implement a programmed function. In some embodiments, the system **300** for processing context data may be implemented on one or more computing devices which may be, but are not limited to, one or more mobile computing devices such as laptop computers or handheld computing devices such as mobile telephones, palm held personal computers (palm PCs), personal digital assistants or wearable computers and the like. In other embodiments, the system **300** may be implemented on personal computers, backend workstations or servers supporting an organisation. In addition, the system **300** can be, but is not limited to, implementation on the same computing device as the sources **302**, sensors **304** and applications, and as will be shown, the system **300** will communicate or operate with sources **302**, sensors **304** and applications remotely located to the computing device that includes the system **300**.

The primary sources **302** that are used in the system **300** are location providers such as GPS receivers or mobile location beacons and the like. Other sources **302** may, to name a few, provide time, identity information/data, system events, and the input/output of touch-screen graphical user interfaces (GUIs). The sources **302** provide context data to the sensors **304**. That is, for each source **302**, a sensor **304** is implemented to retrieve the required context data from at least one source **302**. That is, the sensors **304** can translate the context data provided by the sources **302** into a suitable format to provide the context data to the system **300**.

Alternatively, sensors **304** may be incorporated as a component/or a portion of the sources **302**, allowing the source **302** to interface with the system **300**. The collection of context data is performed by sensors **304**, which send the context data to the communication manager **308**. The collected context data is received by the communication manager **308**, which is then passed onto the event filter **310**.

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The sensors **304** can be implemented as driver programs for the sources **302** or other customised wrapper programs, for example a sensor program implemented using CORBA (Common Object Request Broker Architecture) may be used as a wrapper program to interface with a source **302**. In other realisations, a sensor **304** could be implemented as a wrapper program around a source **302** using CORBA. In these cases, the passing of collected context data from the CORBA-based sensor **304** to the system **300** can be performed via the IIOP (Internet Inter-ORB Protocol).

In a specific realisation, a sensor **304** is implemented as a software agent (sensor agent) that monitors a source **302**. The necessary context data is retrieved and sent/communicated to the system **300** via an ACL (Agent Communication Language, a standard message format defined by FIPA (Foundation for Intelligent Physical Agents), an international standard organization for multi-agent systems). The collaboration with multiple sensor agents or objects across multiple computing devices enables the collection context data from the sources **302**.

As another example of a sensor **304**, the source **302** may be an operating system (OS) of a computing device on which the system **300** has been installed. A sensor **304** can be implemented as a sensor agent, which may collect context data or interesting events (like system events) from the OS. These system events can be, for example, the use of specific application systems, the state of the battery of the computing device, the state or type of current network connection, the list of currently active application systems on the computing device and so on.

Some of the events that occur are the arrival of context data where the system **300** receives context data from the sensors **304**. The received context data is in a particular format according to the particular sensor **304** used. Thus, the event filter **310** filters these events, received context data, into fact data that is stored in the context repository **312**. The fact data is based on the retrieved context data, where the event filter **310** needs to validate and filter the context data into a specific format that depends on the implementation of the rule engine **314**.

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The context repository **312** may be a database, data files, a filing system, or computer-readable media, for example, hard disk drive other storage devices and media, memory or other software system suitable for the storage and retrieval of the fact data.

In order to filter the received context data, the event filter **310** refers to the ontology registry **318**. The ontology registry **318** is a registry of each source's **302** and/or sensor's **304** structure of context data and/or rules related to the received context data, which are referred to as context data definitions. The context data definitions enable the event filter **310** to filter the received context data into fact data. These definitions and rules for filtering the context data are implemented in the system **300** as a portion of the overall rule-set, and determine how the event filter **310** will filter the received context data to evaluate the specially formatted fact data.

However, if the context data definitions are not already defined in the registry then the system **300** cannot validate or filter the received context data. To overcome this issue, the system's **300** ontology registry **318** and requisite portion of the rule-set can be dynamically updated in real-time. In order to do this, the sources **302** and/or the sensors **304** will specify (act as a rule-source) to register their context data definitions and requisite rules with the system **300** using the ontology registry interface **320** that is connected to the ontology registry **318**.

In yet other realisations, the sensor **304** does not necessarily need to stay resident after registering the context data definition of the source **302**. This type or portion of a sensor **304** may simply register on start-up, (of the source **302**), and then uninstall itself, allowing the source **302** to communicate with the system **300**. In addition, this allows the source **302** to be implemented as a thin client on the computing device or other external device.

Furthermore, a source **302** and/or sensor **304** can dynamically be added by, instead, registering its context data definition or service with an application that provides a directory service, such as a directory facilitator or mediator. This application can

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then be instructed by either the source **302** and/or sensor **304** or the system **300** to register the context data definition and/or the associated rules on behalf of the source **302** or sensor **304** either via the ontology register interface **320** or through other means. Alternatively, a system administrator application may enter the required definition using the ontology registry interface **320**.

In addition, if a sensor **304** is installed, the sensor's **304** installation program may interface with the system **300** to provide the context data definition the sensor **304** uses to send context data to the communication manager **308**. The methods in which a sensor **304** and/or source **302** can register a context data definition with the system **300** are not limited to that described above.

Once validation and filtering of the received context data into fact data has been achieved, the fact data is stored in the context repository **312**. This produces a change in the context repository **312** that triggers the rule engine **314** to process the fact data. The fact data is processed by the rule engine **314**, which evaluates the rules related to producing context information from the context data. These rules are stored within a rule registry (not shown) and are also known as rule scripts or production rules which may be in the form of an *IF <condition> THEN <action>* structure.

Initially, there is a predetermined rule-set including a plurality of rules that are stored in the rule registry when the system **300** is installed. This predetermined rule-set may specify the rules relating to and satisfying, at the design/installation time of the system **300**, an organisation's specific requirements for processing context data into context information. If any of the conditions, or predetermined requirements that are represented with logically linked conditions, within the rules are satisfied, then the rule engine **314** will execute the *<action>* portions of the rules.

These *<action>* portions will at times generate mid-level and/or higher-level context information and are further stored in the context repository **312** as additional fact data. The lowest level context information is, in fact based directly on the context

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data. For example, the context data can be based on identity (user number 2), time (30 minutes) and location data (latitude/longitude co-ordinates), and mid-level context information can be, for example, *"user 2 has been at the latitude/longitude co-ordinates for 20 minutes"*, and higher-level context information can be, for example, *"user 2 is late"* or *"user 2 is in danger"*. An application may make a request for any level of context information i.e. either low/mid or higher-level context information.

Recently generated mid/higher-level or stored low-level context information can influence other rules and, as a result, the rule engine **314** will need to re-process the fact data (which may now include the generated mid/higher-level context information and low-level context information such as context data) by re-evaluating the rules.

The rules of the rule-set related to the rule engine **314** are stored and registered in a rule registry (not shown). The receipt/registration of these rules is achieved via the rule registry interface **322**. However, among other rule-sources, applications may also register additional rules that are specific to the context information required by that application. The rule engine **314** executes the rules stored in the rule registry based on the collected fact data to generate the mid/higher-level context information.

Any changes made to the fact data of the context repository **312** will result in the execution (or firing) of rules that notify the change to the interest registry **316**. The interest registry **316**, then sends announcement messages, or if a context information request is satisfied, messages containing the context information to applications that have stored their request for context information with the interest registry **316**. In this embodiment, the messages are sent to applications and other systems via the communication manager **308**.

Alternatively, the rule-engine **314** may contain rules relating to notifying the applications directly when a condition is met. That is, the rule-engine **314** may even

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communicate the context information directly to the requesting application via the communication manager **308**, bypassing the interest registry **316**.

Achieving the notification of context information that is requested by an application requires that an application communicate with the system **300**. The application provides the capability of functioning as a rule-source and sends rules and/or related data relating to requests for context information to the system **300**. This is known as registration, or registering an applications interest or interests in context information. A subscription-based registry (not shown) is used as each request for context information is received. This registry stores information about the request for context information and its sender, i.e. the application that sent it.

In this embodiment, the subscription-based registry is located within the interest registry **316**. Applications can communicate and store requests for context information with the interest registry **316** via the interest registry interface **324**. In this embodiment, the interest registry interface **324** is connected to the communication manager **308**.

The interest registry interface **324** may be used for other forms of communication with applications instead of only receiving context information requests (interests). Such communications can be the communication sometimes required between the communication manager **308** and an application, where the application provides the capability of functioning as a protocol-source. This is described in detail with reference to Figure 2.

Figure 2 illustrates a communication manager **308** for use in the system **300** of Figure 1. The goal of the communication manager **308** is to manage all the communication with the sensors **304** (and/or sources **302**) and applications. The communication manager **308** has a message sender **400**, a message receiver **402**, a protocol registry **404**, and numerous protocol implementations **406**.

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Incoming messages **408** from entities such as sensors **304**, sources **302** and/or applications are received by the corresponding protocol implementation **406**. The incoming messages **408** are passed to the message receiver **402**. Each protocol implementation provides an interface between sources **302**, sensors **304** and/or applications (which possibly have capabilities of functioning as protocol-sources and/or rule-sources) and the message receiver **402**. The protocol implementations **406** can be executable programs, like API's, based on the various communication protocols such as, for example the Linux program *inetd* that uses the TCP/IP protocol. Each protocol implementation **406** occupies a physical or logical port within the computing device that includes the system **300**. The protocol registry **404** stores the various communication protocols and/or the code that performs the implementation of the communication protocols, such as the protocol implementations **406**. The protocol registry **404** stores the identity of sources **302**, sensors **304**, and/or applications that are now known to the system **300**.

New entities such as sources **302** (context data sources), sensors **304**, and/or applications need to have the functionality of specifying the communications protocol they will use (acting as protocol-sources) in order to be added and registered to the system **300**. This is achieved by the provision of a handshaking procedure between the communication manager **308** and the new entities. The handshaking procedure provides for, among other things:- a) requests for registration from the entity to the communication manager **308** (or in principle vice-versa), b) the registration of new entities which will be communicating with known communication protocols with the communication manager **308**, or c) entities with new communication protocols which will be able to specify, by transmitting to the communication manager **308**, the required new communication protocol and register accordingly. This ensures the system **300** can communicate with new sources **302**, sensors **304**, and/or applications in the future and remain operational.

Initially, a common communication protocol is used to initiate communication between the communication manager **308** and the new entity. Typically, this communication will be via a designated communication port that is used for

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registering entities. The entity notifies the communication manager **308** of the new communication protocol that it will use for future communications. The communication manager **308** then searches the protocol registry **404** for a communication protocol that matches. If the communication protocol and code is known to the communication manager **308**, i.e. it is stored in the protocol registry **404** or found in another similar location within system **300**, the communication manager **308** simply registers the entity in the protocol registry **404**.

As the communication manager **308** now has the ability to communicate with the entity, it allocates a specified communications port to the entity for future communication. If necessary, this communications port may possibly be shared among other entities. This keeps the designated communication port free for new entities to register with the communication manager **308**. The communications ports can be, among other things, network ports.

On the other hand, if the communication manager **308** determines that the entities new communication protocol is not already stored within the protocol registry **404** then the communication manager **308** notifies the entity with a request for the transmission of the required new communication protocol information. The new entity will then transmit the new communication protocol information (including new code for implementing the communication protocol) to the communication manager **308**.

Once the transmitted new communication protocol information is stored in the protocol registry **404** the communication manager **308**, then registers the entity, i.e. identification information etc., with the protocol registry **404** or another similar location within system **300**. A communications port is then allocated to the protocol-source for future communication as discussed above.

In addition, the protocol registry **404** provides a secure storage facility for communication protocol information received by the communication manager **308**, for example, the protocol registry **404** may be located within a central server. This

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provides added security ensuring the system **300** has access to legitimate entities such as sources **302**, sensors **304**, applications. As an example, if an entity or a third party application such as a directory service, cannot fulfil the transmission of the new communication protocol information or the identity of the entity etc., then the communication manager **308** will not register that entity or store its communication protocol information.

The code that performs an implementation of the new communication protocol may be given in a platform independent format, such as byte-code format or interpreter based formats like XML. This allows the system **300** to be hardware, operating system, and programming language independent and provides the capability of future maintenance and evolution without costly redevelopment of the system **300**.

It should be noted, that after the registration of a new entity such as a new source **302** and/or a sensor **304** that provides new context data, the format of the received context data may be unknown, i.e. the context data definition may also be new to the system **300**. As a result, the event filter **310** and ontology registry **318** may require updating as was described previously with reference to Figure 1. That is, referring back to Figure 1, the new sources **302** and/or sensors **304** will need to provide the capability of functioning as a rule-source. Alternatively, a third party rule-source, such as a directory service, could act on their behalf. The new source's **302** and/or sensor's **304** context data definitions and requisite rules may be stored and registered with the system **300** using the ontology registry interface **320** that is connected to the ontology registry **318**.

Referring back to Figure 2, each protocol implementation **406** receives an incoming message **408** that follows a particular protocol. These incoming messages are converted by the protocol implementation **406** into messages that can be understood by the system **300**.

Firstly, each incoming message **408** is received via one of the protocol implementations **406**. The incoming message **408** contains at least two types of

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information:- the sender of the message (that is, for example, the source **302**, sensor **304**, and or application that sent the message) and the message content. As an example, if the sender of the message is a sensor **304**, and/or the message content relates to context data, then the message receiver **402** will forward the converted message to the event filter **310** for validation and filtering into fact data.

Alternatively, if the sender of the message is an application, and/or the message content relates to a request for context information, then the message receiver **402** will forward it to the interest registry **316**, where the sender of the message's request is registered in the subscription registry.

An example of an ACL message that may be received by a protocol implementation **406** from a source **302** or a sensor **304** is shown below.

```
(Inform
:sender (agent-identifier :name gps@pda.com :address
iiop://pda.bt.com/acc)
:receiver (agent-identifier :name context_engine@pda.com :address
iiop://pda.bt.com/md)
:language FIPA-SL0
:protocol FIPA-Inform
:ontology Context-Management
:content
    (contextchanged
(data
    (ontology TravelManagement)
    (Location (x-coordinate 2093093)(y-coordinate 3087239)))))
```

In this example, the protocol implementation **406** communicates with a FIPA agent and the message may have the form shown above. On receiving the message, the protocol implementation **406** will remove the ACL message content. As can be seen in this example, the predicate name of the content is *"ContextChanged"*, and the protocol implementation **406** can identify that this content is aimed for event filter **310**.

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With reference to Figure 1, the content of the ACL message is sent to the event filter **310**, where it is filtered into fact data before being inserted into the context repository **312**. The event filter **310** will need to look up the rules and context data definitions within the ontology registry **318** to validate the received data. This ensures that only legitimate data is inserted into the context repository **312**. On successful validation and filtering, the event filter **310** enters the fact-data into the context repository **312** using an API provided by the context repository **312**.

The context handling logic within the system **300** consists of two parts: the context data definition part and context handling rules or rules related to the rule-engine **314**. The context data definition part is registered in the ontology registry **320** via provided APIs or ontology interfaces **320**. The context handling rules are registered in the rule engine's **314** rule registry (not shown) via the rule registry interface **322**.

A language syntax that defines context data definitions and handling logic is dependent on the specific implementation of the rule engine **314** used. Any type of rule engine **314** may be used in system **202**. In this symbolic embodiment, the rule engine **314** that is used is the JESS (Java Expert System Shell, http://herzberg.ca.sandia.gov/jess/) engine. In this case, the portion of the rule-set related to the rule engine **314** are rules in the JESS format (written as rule scripts) which are provided by either rule-sources, such as applications versed in the JESS syntax, or the predetermined rules entered by the system developer during design time.

An example of a context data definition that can form an entry in the ontology registry **318** is shown below.

```
<Ontology name=TravelManagement>
  <Entity>
    <Name>Location</Name>
    <Slot>
      <Name>x-coordinate</Name>
      <Type>NUMBER</Type>
    </Slot>
    <Slot>
```

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```
      <Name>y-coordinate</Name>
      <Type>NUMBER</Type>
    </Slot>
  </Entity>
  <Entity>
    <Name>Job</Name>
    <Slot>
      <Name>Id</Name>
      <Type>STRING</Type>
    </Slot>
    <Slot>
      <Name>Status</Name>
      <Type>STRING</Type>
    </Slot>
  </Entity>
</Ontology>
```

Another example of the above context data definition is shown below in JESS syntax. The name of the entry in the ontology registry **318** can be the name of the JESS file to allow easy loading of the context data definition by the event filter **310**.

```
TravelManagement.clp
(deftemplate Location
(slot x-coordinate (type STRING))
(slot y-coordinate (type STRING))
)
(deftemplate Job
(slot id (type STRING))
(slot status (type STRING))
)
...
```

The context handling rules, i.e. the portion of the rule-set related to the rule engine **314**, takes the form of *IF-THEN* production rules. Such production rules consist of two parts: 1) the condition part and 2) the action part. The condition part is used to define a condition that specifies the designated state of some fact data (derived from received context data). If the condition is satisfied, then the action part is executed.

An exemplary production rule for the JESS rule engine **314** is illustrated in the production rule fragment below.

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```
(defrule from-activated-to-executing
(salience 70)
(Job (id ?jid)(status Ongoing))
(Customer (location ?cl)(job_id ?jid))
(CurrentLocation (location ?ccl))
 (around ?cl ?ccl)
=>
(update (Job (id ?jid)(status Completed)))
```

Typically, the action part would comprise functions that modify the progress of a job status or mid-level context information or fact data. In general, a large number of rules will be defined to specify the fact data processing logic for each organisation and/or application. There are two types of generic production rules, 1) a mid-level context rule and 2) a higher-level context rule. A mid-level context rule produces (or updates) mid-level context information based on the change of fact data (i.e. the change in context data collected from the sources/sensors **302/304**). Higher-level context rules will produce (or update) higher-level context information based upon mid-level context information and/or fact data.

The context data is the data that is collected by a sensor **304** or sent by a source **302** (if no sensor **304** is available, or the sensor **304** and source **302** are combined) while context information is generated by processing the fact data (which is based on context data) and/or context information (stored as fact data).

As an example, the location and time data obtained from a GPS system is context data, while *"the user stayed at the same location for 30 minutes"* is mid-level context information, whereby higher-level context information derived from the mid-level context information may be *"the user will be late"* or *"the user is in danger"*, or some other statement.

Figure 3 illustrates an interest registry **316** for use in the system **300** of Figure 1. The interest registry **316** is the mechanism with which rule-sources, for example applications with the capabilities of functioning as rule-sources, can register their predetermine requirements, rules and/or related data relating to context information and requests for context information, an interest registration entry. The rule-sources

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that register are called registrants and all registrants of the interest registry **316** will receive notification messages if context information is available that satisfies the conditions imposed by their predetermined requirements, rules and/or related data.

As shown in Figure 3, the interest registry **316** has a registry reception **500** that communicates with the communication manager **308**. The registry reception **500** either receives an interest registration entry (e.g. predetermined requirements, rules and/or related data relating to requests for context information) from a rule-source or sends a notification message (e.g. message containing context information) to the corresponding rule-source, for example an application.

On receiving a rule or related data relating to a request for context information, the registry reception **500** will retrieve the content of the request for context information and insert it into permanent storage in a registry database (DB) **502**. Registry reception **500** then invokes a rule-translator **504** that produces an invocation rule, represented by line **506**. This invocation rule can be input into the rule registry of the rule engine **314**. The invocation rule will then trigger the rule engine **314** into notifying the interest registry **316** to send notification message back to the registrant when its predetermined requirement or rule is met. Alternatively, the invocation rule can trigger the rule engine **314** into notifying rule-source by sending a notification message back to the registrant when its predetermined requirement or rule is satisfied.

A request for context information sent by a rule-source, e.g. an application with context aware features, to the interest registry, (i.e. an interest registration entry or rule and/or related data relating to a context information request) is shown below.

```
<InterestRegistry>
  <Registrant>
    <Type>FIPA-AGENT</Type>
    <Name> personalagent-
10023043@mpower.com.bt</Name>
    <Address>iiop://mpower.com.bt/acc</Address>
  </Registrant>
  <ContextInformation>
```

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```
<Ontology>TravelManagement<Ontology>
<Entity>Job</Entity>
<Slot>
  <Name>Status</Name>
  <UpdateType>REACHED</UpdateType>
  <Value>Completed</Value>
</Slot>
</ContextInformation>
</InterestRegistry>
```

This request consists of two main parts: the recipient part and the context information part. The recipient part contains information regarding the registrant, (i.e. the application), and the protocol implementation it wants to use to communicate with, which may be an agent or any other component such as CORBA, Component Object Model, or Enterprise Java Beans, for example. The context information part defines the context information that interests the registrant.

In the above request for context information, the registrant is an application that uses a FIPA compliant software agent that is running in the address of *iiop://mpower.com.bt/acc*. The agent, *personalagent-10023043@mpower.com.bt*, is interested in the status slot value of all Job objects defined in the *TravelManagement* ontology, given by the previous ontology registry entry. In particular, the agent wishes to be notified when the status slot has *"Completed"* as its value.

An example of an invocation rule is shown below which is a portion of the rule-set related to notifying the rule-source of requested context-information.

```
(defrule notify-external-application
(Job (Id ?jid)(Status COMPLETED))
=>
(Notify personalagent-10023043@mpower.com.bt ?jid))
```

In this invocation rule definition, *'Notify'* is a system function that will call an API provided by registry reception **500** to send a notification message to the recipient/registrant by providing the specified arguments: recipient and context information.

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Referring back to Figure 2, the communication with rule-sources, e.g. applications, is performed via the communication manager **308**. This works by having the rule-source send a rule and/or related data or an interest registry subscription message relating to a request for context information. This message is received by message receiver **402** and then passed to the interest registry **314**. When the context information request is fulfilled, a notification message containing the recipient and the context information is passed to message sender **400** and is sent out to the designated rule-source, e.g. application that had registered its request to the context information.

Before sending, the message sender **400** first checks the required protocol to send/communicate the message to the recipient by querying the protocol registry **404**. The protocol registry **404** returns an object reference of the installed protocol implementation **406** if the protocol implementation **406** has been registered. The message sender **400** will then use the object reference to invoke the required protocol implementation **406**. The method of invocation is done via a predefined interface definition that defines all the methods that should be implemented by any protocol implementation **406**.

An example of an interface that would be implemented by the corresponding protocol implementation **406** is shown in the following code fragment.

```
Interface ProtocolImplementation {
        Boolean sendMessage(Message msg);}
```

Referring to Figure 4, an illustration of a preferred embodiment of a network for processing context data is shown. This is used in conjunction with an organisation's work management system **100**. The system **300** for processing context data (called system, and not shown in this Figure) is provided as a program on each portable device (PD) **102a** to **102e**, (for more details refer back to Figure 1).

The PDs **102a** to **102e** are carried by the organisation's workforce **104a** to **104e** and will have access to a common communication infrastructure **106** via various

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interfaces/communication elements like mobile terminal antennae **108**, infrared antennae/connections **110**, or a wireless LAN interfaces **112**, to name a few. Networked to the common communication infrastructure **106** are various communication elements like mobile base-stations **114**, or wireless LAN transceivers **116**. These are only examples of what interfaces/elements could be used to provide access to the common communication infrastructure **106**, as well, wired interfaces/elements may also used.

The work management system **100** is located onsite within the organisation, for example, within an organisation's offices or management centres. The work management system **100** also has access to the common communication infrastructure **106**. The worker's locations **120a** to **120e** are either offsite or onsite. As an example, the workers **104a** to **104e** can work offsite, such as service engineers working in the field, or alternatively, the worker's locations **120a** to **120e** can also be onsite in and around the organisation's offices.

Context data is collected by sensors **122b**, **122c**, **122d**, or **122e** from various external sources (not shown) that are located in and around the worker's location. As has been discussed with reference to Figures 1, 2 and 3, the sensors **122b**, **122c**, **122d**, or **122e** can have the capability of functioning as protocol-sources. In addition to providing context data, these protocol-sources also provide the system for processing context data with the required communication protocols and code for performing an implementation of the communication protocol, and other related information, enabling the system for processing context data to communicate with the respective sensor **122b**, **122c**, **122d**, or **122e**. Other sensors or sources can be located internally on the PDs **102a** to **102e**, of which some examples are shown in Figure 5.

The work management system **100** communicates with the worker **104a** in location **120a** via the PD **102a**. The work management system **100** can be an application that has the capabilities and functions of a rule-source. Alternatively, the work management system **100** can be set-up to communicate automatically or directly with the PD **102a** itself without the worker's **104a** assistance.

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In this case, the PD **102a** is in communication with the work management system **100** via base-station **114** of the common communication infrastructure **106**. The system for processing context data on PD **102a** will receive a rule and/or related data relating to a request for context information, conveyed by signal **124a**, from the work management system **100**. This will update the rule-set contained within the system for processing context data on PD **102a**. The context information requested may be the location of the worker **104a**, the number of jobs/tasks completed, or some other organisation specific information, for example, information required for organising/optimising the worker's job schedule.

The rule and/or related data relating to the request for context information is conveyed by signal **124a** and processed by the system for processing context information on PD **102a**. If the system on PD **102a** has received and processed the relevant context data received from any available sensor (not shown) then the system will notify and send the context information, in a required format, to the work management system **100**, as conveyed by signal **126a**. The work management system **100** receives and processes this information and takes action depending on the organisation's requirements. For example, it may send the worker **104a** to a different location to perform another job.

The worker **104b** in location **120b** shows an example where a sensor **122b** communicates context data, conveyed by signal **128b**, to the PD **102b**. The sensor **122b** sends any collected context data in a specific format to the PD **102b**. In this case, the system on PD **102b** either already knew the specific format the context data was being sent in and the communication protocol that the sensor **122b** uses for communication, or this information (the sensor's **122b** context data formats and protocol information) has previously been communicated to the system via the initial handshake procedure as described in Figure 2.

The PD **102c** of the worker **104c** at location **120c** is currently sending context information, conveyed by signal **126c**, to the work management system **100** via the

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common communication infrastructure **106**. In addition, PD **102c** is in communication with sensor **122c**, i.e. the sensor **122c** has the capabilities of also functioning as a protocol-source. In this case, the system within PD **102c** is performing a handshake operation represented by signals **130c** with sensor **122c** which communicates/or registers with the system additional instructions and/or rules and related data relating to the specific format of the context data that sensor **122c** collects, as described previously with reference to Figures 1 to 3. After the handshake operation, sensor **122c** will then be able to send context data collected from its sources (not shown) to the system in PD **102c** for processing.

In a similar manner as described above, the system of PD **102d** of worker **104d** in location **120d** receives a rule and/or related data relating to a request for context information, conveyed by signal **124d**, from the work management system **100** via the common communications infrastructure **106**. As well, the system of PD **102d** receives signals from a GPS satellite system **130** for the calculation of location context data within a GPS receiver located on PD **102d** for collection by an onboard sensor (not shown). This sensor is located within PD **102d,** and can send location information to the system on PD **102d**.

In addition, there is peer-to-peer communication between PDs **102c** and **102d**, conveyed by signals **132c** and **132d**, where the PDs **102c** and **102d** are requesting and/or receiving context-data and/or context information from each other. In this case, PD **102c** makes a request for context information, conveyed by signal **132c**, from PD **102d**, whereby PD **102d** having already processed the request, via its own system for processing context data, provides the context information, conveyed by signal **132d**. The PDs **102a** to **102e** themselves may act as rule-sources or protocol-sources, i.e. applications, sources, or sensors with respect to each other and/or the work management system **100**.

At location **120e**, the system on PD **102e** is performing a similar handshaking operation with the sensor **122e** that collects context data from its respective source as has similarly been described that of PD **102c** above.

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Examples of PDs **102a** to **102e** that may be used are any portable device such as a mobile phone, personal digital assistant (PDA), or laptop computer. In addition, should a PD not be capable of running or storing a system for processing context data, then the system may instead be installed on another device, i.e. located externally to the PD, yet still having the capability of interacting (i.e. receiving context data and requests for context information and sending context-information) to rule-sources via the PD or otherwise.

Figure 5 illustrates a preferred embodiment of a portable device (PD) **102** for use in the network for processing context data of Figure 4. A Personal Agent software program **204** controls the interaction between the system **300** for processing context data and the different sources **206a** to **206d** and rule-sources **100, 208b** and **208c**, e.g. the applications, shown in this Figure. The sensors (not shown) that collect context data from the sources **206a** to **206d** are implemented as software programs that are installed on the PD **102**. Furthermore, PD **102** contains communication hardware such as a mobile terminal antenna **108**, an infrared communication device **110**, and a wireless LAN communication device **112** for communication with external entities, protocol-sources and rule-sources, such as external sources, sensors and applications like the work management system **100**. The communication hardware is not limited to only wireless communication hardware, i.e. wired communication hardware can also be used to connect/access the communications infrastructure (not shown).

The sources **206a** to **206d** that are shown in Figure 5 are located internally/or on the PD **102**. These sources **206a** to **206d** could be a GPS satellite receiver **206b** for providing location data, or other context data sources such as a touch screen graphical user interface **206b**, a track pad **206c**, and other programs/devices that generate system events **206d**, to name a few. These sources **206a** to **206d**, communicate with their respective sensors, which are registered with the system **300**.

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The sensors will typically interact with the operating system administration software **208c**, which in turn directs these interactions to the Personal Agent **204**. The Personal Agent **204** can in fact act like a aggregate protocol-source or rule-source with system **300**. That is, when required the Personal Agent **204** directs the appropriate entities, protocol-source and/or rule-source interactions, i.e. a sensor's or application's **100, 208b** and **208c** interactions (namely the collected context data, context data definitions, communication protocol information, rules and/or related data relating to requests for context information), to system **300** for processing context data into context information.

The rule-sources (applications) **100, 208b** and **208c** that are shown in Figure 5 are a work management system **100**, an email program **208b**, and the operating system administration **208c**. Note, in addition to being an application (rule-source), the operating system administration **208c** may also have sources installed or embedded, in this example there are sources called system events **206d**. The rule-sources (applications) **100, 208b** and **208c** send rules and/or related data relating to requests for context information to the system **300** via the Personal Agent **204**. When the context information has been evaluated by the system **300**, the system **300** sends the context information, in an appropriate format, to the respective rule-source (application) **100, 208b** and **208c** that requested the context information.

Other configurations of the Personal Agent **204** and system **300** are possible. As an example, the system **300** may be embedded within the Personal Agent **204**, whereby the Personal Agent **204** may provide several functionalities that are provided by sources, sensors and/or applications (i.e. protocol-sources and rule-sources). The Personal Agent **204** could also receive context data from sources and/or sensors external to the Personal Agent **204** for, among other things, re-direction to the system **300**. Similarly, the Personal Agent **204** may receive requests for context information from rule-sources, e.g. applications, external to it for, among other things, re-direction to the system **300** and as a result send the requested context information when available to the external rule-sources, e.g. applications requesting context information.

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Furthermore, if a portable device (PD) **102** does not have enough processing power or memory storage for the Personal Agent **204** and/or a system **300,** then the Personal Agent **204** and/or a system **300** may be implemented on a computing device external to PD **102.** In this case, PD **102** may interface/communicate with the external computing device to have access to the Personal Agent **204** and/or a system **300**.

In other embodiments, with reference to Figure 2, the functionalities of new entities such as sources **302**, sensors **304** and/or applications, (protocol-source components) do not necessarily need to stay resident after the handshake procedure, when the new communication protocol has been registered and stored in the protocol registry **404.** This type of functionality of the entity may simply perform the handshake procedure on start-up, (i.e. start-up of a source **302**, sensor **304** or application), and then the functionality uninstalls itself, allowing, for example, a source **302** to communicate with the system **300**. In addition, this allows, for example, the source **302** to be implemented as a thin client on the computing device or other external device allowing the sharing of computing resources.

Furthermore, as briefly described above, a new entity (source **302**, sensor **304**, or application) can dynamically be added by, instead, storing its communication protocol and the code for implementing it, with an application providing, for example, a directory service such as a directory facilitator or mediator. This application can then be instructed by the respective source **302** and/or sensor **304** or the system **300** to transmit the new communication protocol and/or code for implementing it, on behalf of the source **302** or sensor **304** or application for storage in the protocol registry **404** and registration with the system **300**. Alternatively, a system administrator application may enter the required communication protocol and code that performs the implementation of the communication protocol via a similar mechanism.

In addition, if a new sensor **304**, for example, is installed, the sensor's **304** installation program may interface with the system **300** to provide the new

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communication protocol that the sensor **304** uses to send context data to the communication manager **308**. The methods in which a new sensor **304** and/or source **302** can store/register its identity and new communication protocol with the system **300** are not limited to that described above.

It will be understood that the present invention extends to methods and/or apparatus substantially as herein described with reference to the accompanying drawings. Any feature in one aspect of the invention may be applied to other aspects of the invention, in any appropriate combination. In particular, method aspects may be applied to apparatus aspects, and vice versa.

In addition, the present invention has been described above purely by way of example, and modifications of detail can be made within the scope of the invention.

Each feature disclosed in the description, and (where appropriate) the claims and drawings may be provided independently or in any appropriate combination.

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CLAIMS

1. A system for processing context data comprising means for receiving context data (304,308,402,404,406) from a plurality of sources (302); means for producing context information (310,312,314,316) from the received context data according to a predetermined rule-set including a plurality of rules; and means for communicating the context information (308,316,400,404,406) to at least one application, characterised in that

the system (300) includes means for permitting at least one protocol-source (302,304,404) to specify a new communication protocol for future communication between the protocol-source and the system, thereby updating the means for receiving (304,308,402,404,406) and/or communicating (308,316,400,404,406).

2. The system according to claim 1 wherein the protocol-source is at least one context data source (302).

3. The system according to claim 1 or claim 2 wherein the protocol-source is at least one of the applications.

4. The system according to any preceding claim wherein the protocol-source is at least one directory service.

5. The system according to any preceding claim which includes a protocol registry (404) for storing the new communication protocol.

6. The system according to claim 5 wherein the protocol-source transmits code to perform an implementation of the communication protocol (406) to the protocol registry (404).

7. A system for processing context data comprising means for receiving context data (310,312,314,316) from a plurality of sources; means for producing context information (310,312,314,316) from the received context data according to a predetermined rule-set including a plurality of rules; and means for communicating

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the context information (308,316,400,404,406) to at least one application, characterised in that

the system (300) includes means for permitting at least one rule-source (320,324,322) to specify at least one rule thereby updating the rule-set, wherein the rule-source specifies rules for filtering and/or formatting the context data.

8. The system according to claim 7 wherein the rules determined by the rule-source further include rules for producing context information from context data.

9. The system according to claim 7 or claim 8 wherein the rule-source is at least one context data source (302).

10. The system according to any of claims 7 to 9 wherein the rule-source is at least one of the applications.

11. The system according to any of claims 7 to 10 wherein the rule-set can be updated dynamically.

12. The system according to any of claims 7 to 11 further comprising at least one registry (318,316) for storing rules specified by the rule-source.

13. The system according to claim 12 which includes a first registry (318) for storing rules for filtering and/or formatting context data and a second registry for storing rules for producing context information.

14. The system according to any of claims 7 to 13 which includes means for notifying (308,314,316) the application when a predetermined requirement is met.

15. The system according to claim 14 wherein the predetermined requirement is at least partly determined by the rules specified by the rule-source.

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16. The system according to claim 14 or claim 15 which includes an interest registry (316) for storing the rules which determine the predetermined requirements of the application.

17. The system according to any preceding claim which includes means for collecting context data (304).

18. The system according to claim 17 which includes means for translating the context data (304) provided by the sources (302) and providing the context data to the system (300).

19. The system according to claim 17 or claim 18 wherein the collecting means is a sensor (304).

20. An apparatus which includes the system (300) for processing context data according to any preceding claim.

21. The apparatus according to claim 20 which includes a wireless interface (108,110,112).

22. A network for processing context data which includes a system (300) for processing context data according to any of claims 1 to 19, a plurality of data sources (302) for supplying context data to the system (300) for processing context data and a plurality of applications for receiving context information from the system (300) for processing context data.

23. The network according to claim 22 wherein at least one of the systems (300) for processing context data is implemented on the apparatus (102) according to claim 20 or claim 21.

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24. The network according to claim 22 or claim 23 wherein at least one of the applications is implemented on the apparatus (102) according to claim 20 or claim 21.

25. The network according to any of claims 22 to 24 wherein at least one of the data sources (302) is on the apparatus (102) according to claim 20 or claim 21.

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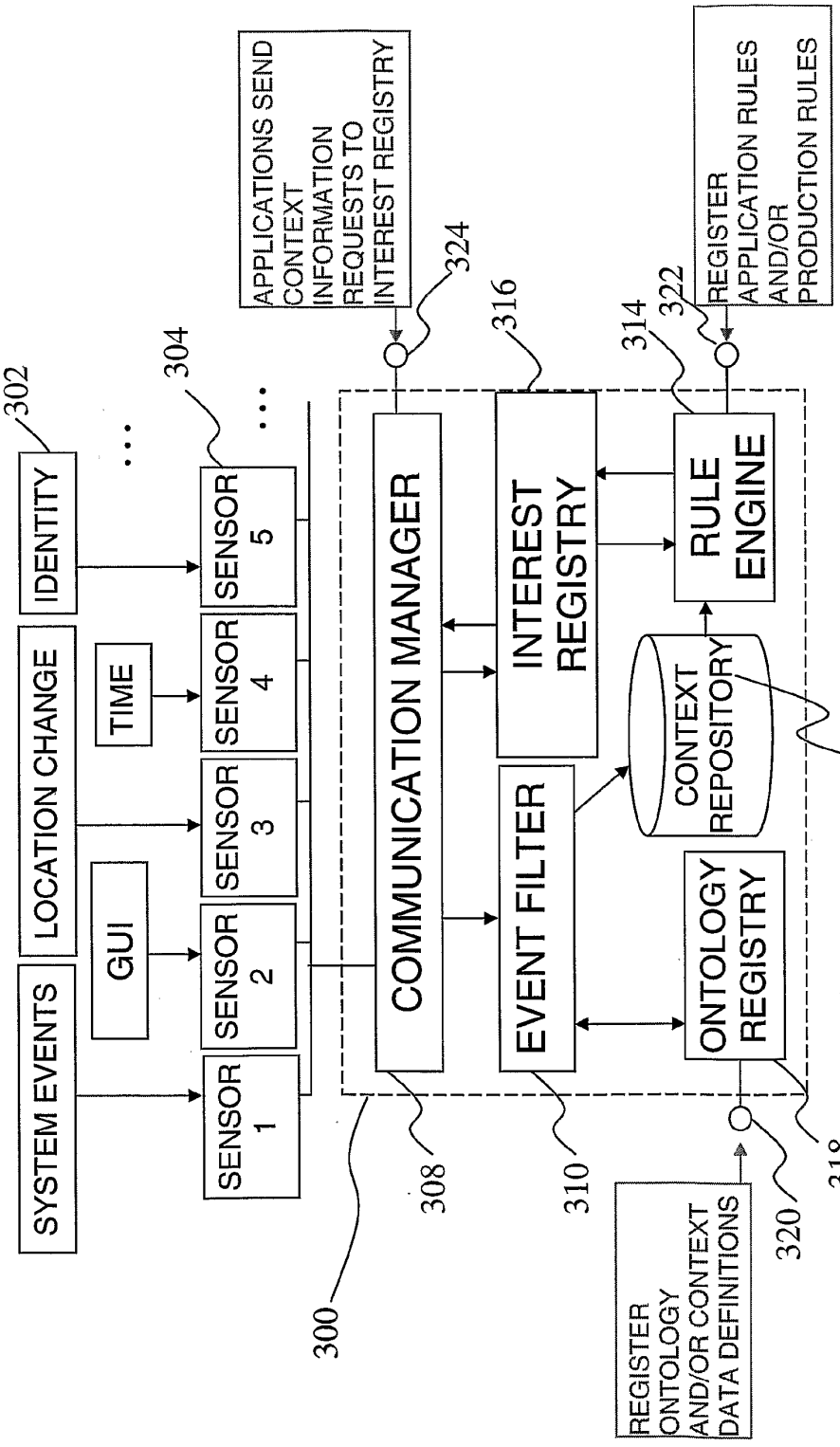


FIG. 1

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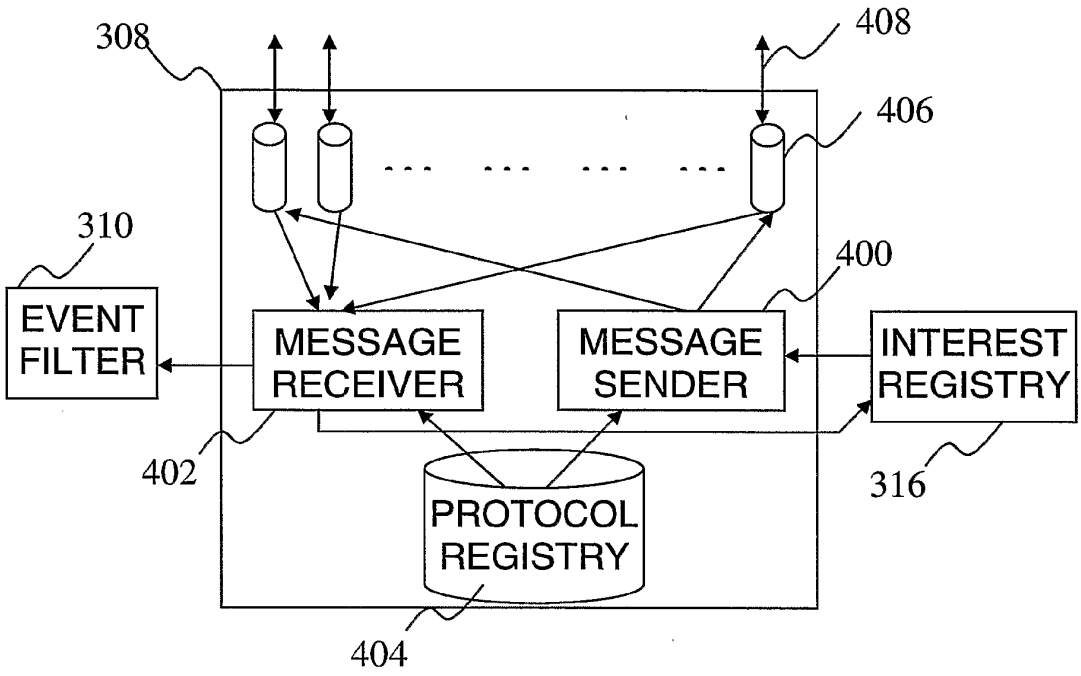


FIG. 2

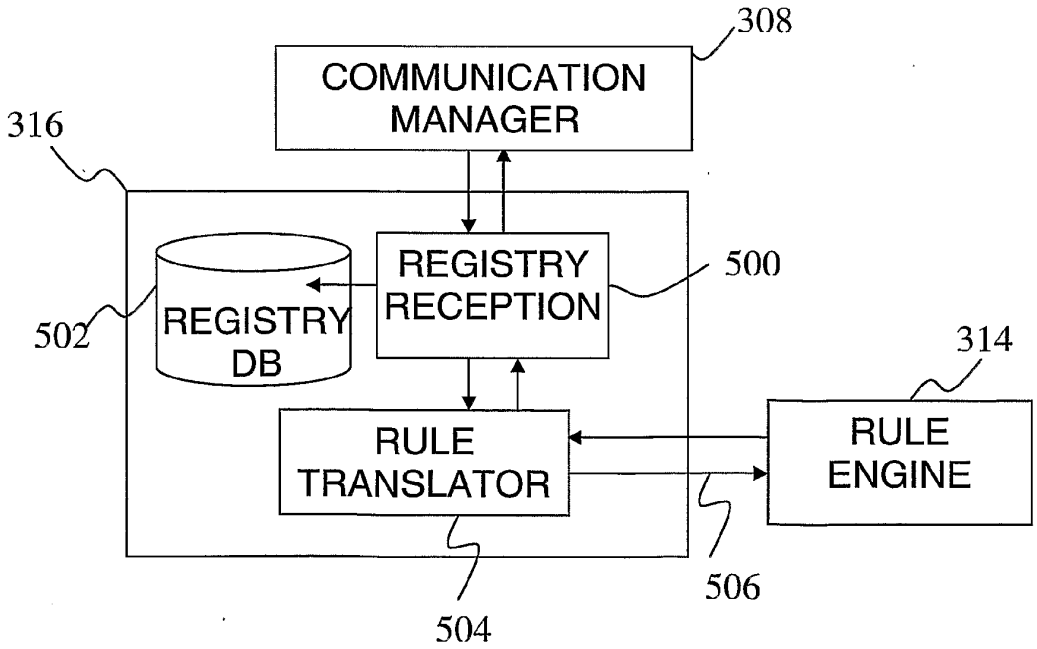


FIG. 3

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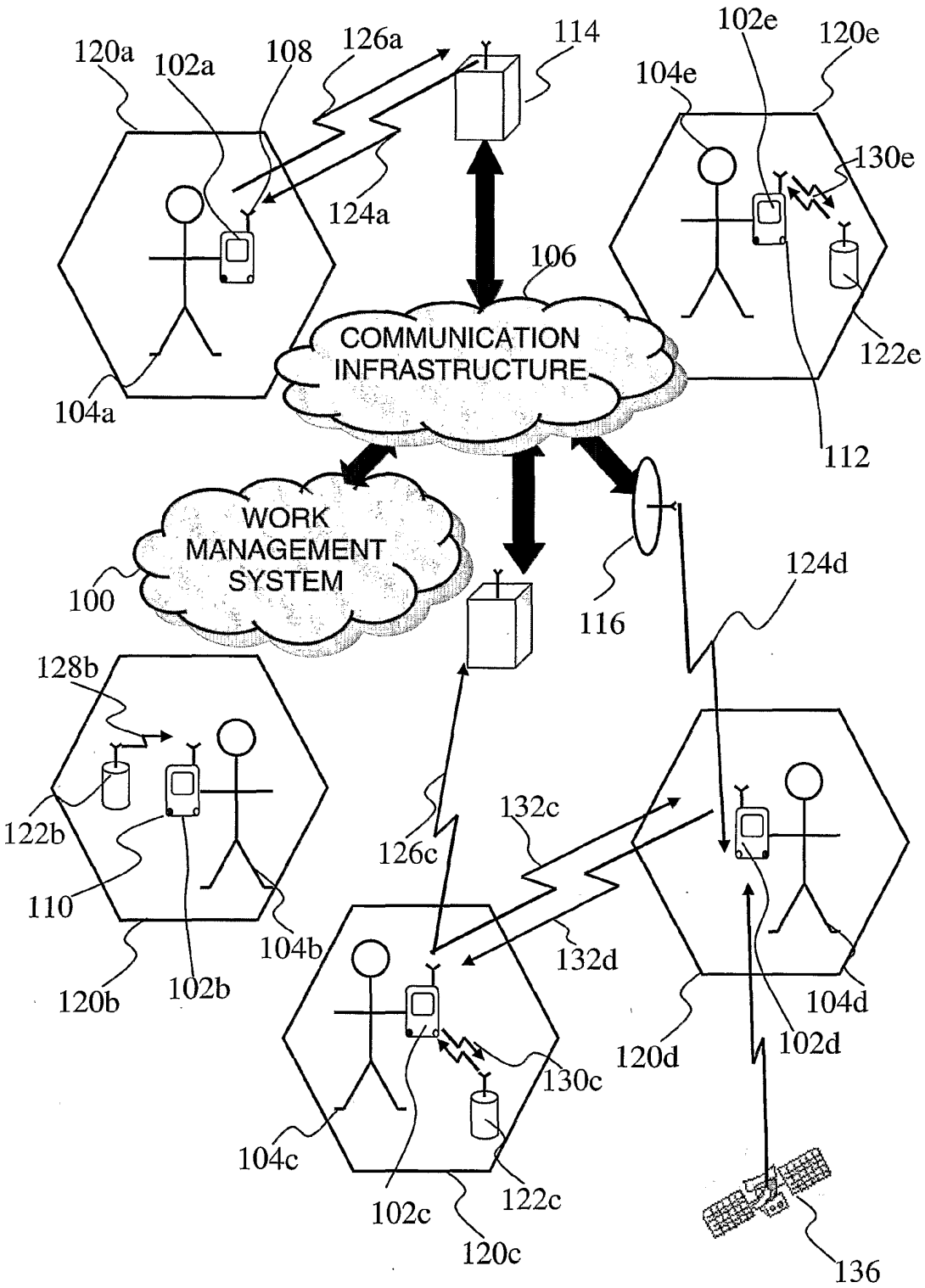


FIG. 4

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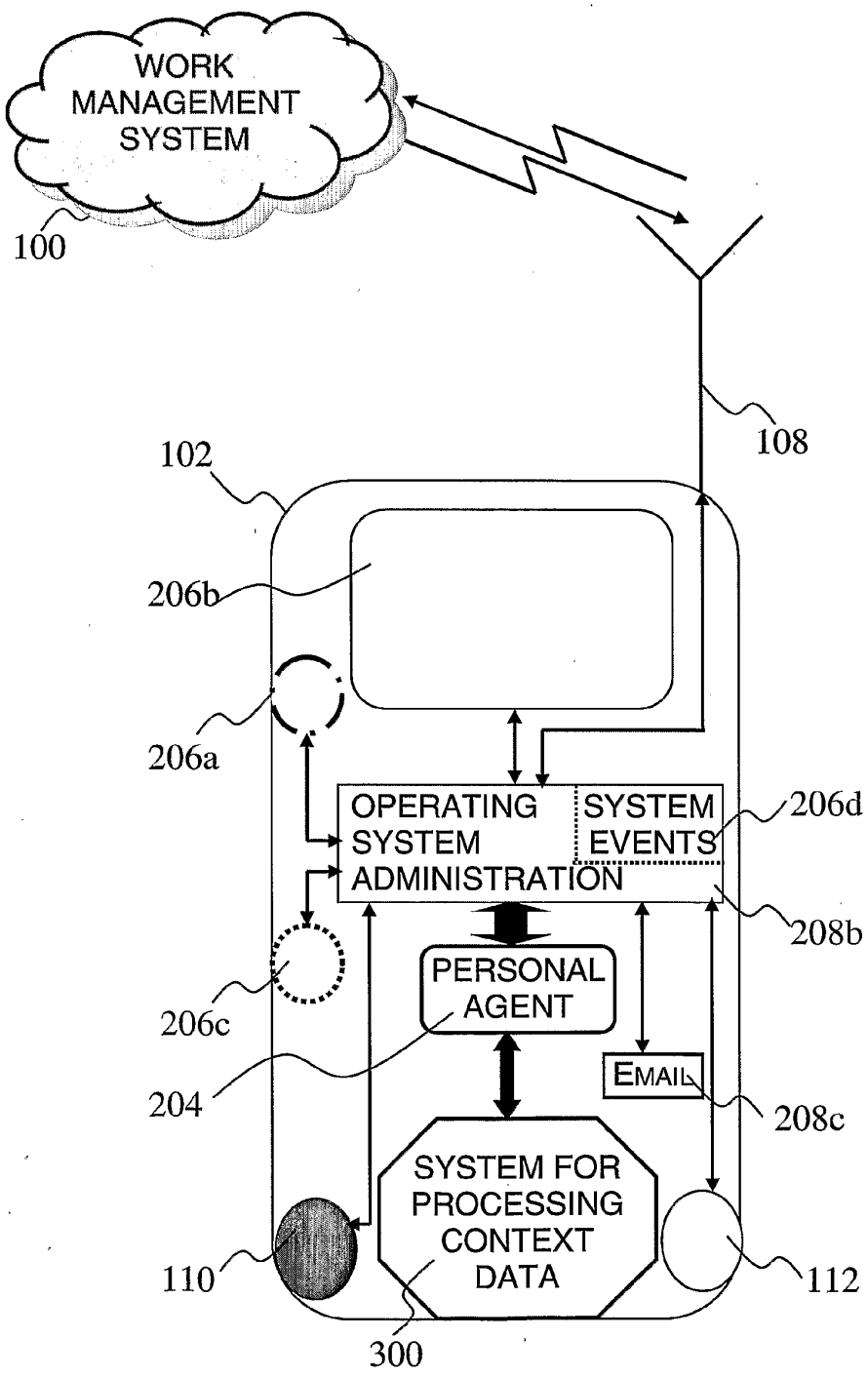


FIG. 5

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/001165

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04L29/06

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)
H04L

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/088666 A1 (ENGEL GLENN R) 8 May 2003 (2003-05-08) abstract figure 1 paragraph [0019]; claim 1	1-25
Y	WO 03/102817 A (TELENOR ASA; DO, THANH, VAN; HARTVIGSEN, ANNE, MARIE) 11 December 2003 (2003-12-11) abstract page 1, line 30 - page 3, line 12 page 4, line 24 - page 5, line 11 page 6, line 1 - page 6, line 4 page 8, line 9 - page 9, line 23	1-25

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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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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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 May 2006	23/05/2006

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Pereira, M

Form PCT/ISA/210 (second sheet) (April 2005)

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/001165

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 1 217 857 A (MICROSOFT CORPORATION) 26 June 2002 (2002-06-26) cited in the application the whole document	1-25
A	US 2004/111397 A1 (CHEN YING ET AL) 10 June 2004 (2004-06-10) cited in the application the whole document	1-25
A	EP 1 199 860 A (SONY INTERNATIONAL GMBH) 24 April 2002 (2002-04-24) the whole document	1-25

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2006/001165

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003088666 A1	08-05-2003	DE 10250581 A1	15-05-2003
		GB 2382413 A	28-05-2003
WO 03102817 A	11-12-2003	AU 2003238732 A1	19-12-2003
		CA 2484802 A1	11-12-2003
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		JP 2005528698 T	22-09-2005
EP 1217857 A	26-06-2002	JP 2002334030 A	22-11-2002
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		US 2005055430 A1	10-03-2005
		US 2005050201 A1	03-03-2005
		US 2005091408 A1	28-04-2005
		US 2005080555 A1	14-04-2005
US 2004111397 A1	10-06-2004	NONE	
EP 1199860 A	24-04-2002	NONE	

Petitioner Samsung Ex-1004, 0176

Electronic Acknowledgement Receipt

EFS ID:	9958806
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett/Darcy Kobylarczyk
Filer Authorized By:	Glen Madison Kellett
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	28-APR-2011
Filing Date:	25-SEP-2009
Time Stamp:	00:06:07
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed (SB/08)	P31880_IDS_04_26_11.pdf	611872 e70ff3d9a12106fc9dce55ce57145eb0ed090431	no	4
Warnings:					
Information:					

2	Foreign Reference	P31880_EP1217857A2.pdf	7229468 d85d3ae70eb6c9a9ba4952f6bc1deb517c821d5b	no	51
Warnings:					
Information:					
3	NPL Documents	P31880_EPSR.pdf	89368 48c16bae07e3473778c9cf4ce5f2bbe0a1852a90	no	3
Warnings:					
Information:					
4	Foreign Reference	P31880_WO2006106303.pdf	5866951 36ecb8365cce7a05e4a1778b44c1888aa6b04b20	no	45
Warnings:					
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			Total Files Size (in bytes):	13797659	

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Kohlenberg, Tobias M.
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Kohlenberg, Tobias M.
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

	1	Office Action Received for European Patent Application No.10251637.4 mailed on March 22, 2011, 7 pages.	☐

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Kohlenberg, Tobias M.
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

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☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/GMK/	Date (YYYY-MM-DD)	2011-05-19
Name/Print	Glen Kellett	Registration Number	60,202

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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Petitioner Samsung Ex-1004, 0182

(19) Europäisches Patentamt
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(11) EP 2 302 886 A1

(12) EUROPEAN PATENT APPLICATION

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H04M 1/725 *(2006.01)*

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Designated Extension States:
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(30) Priority: **25.09.2009 US 567386**

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(72) Inventors:
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(54) Method and device for controlling use of context information of a user

(57) A method and device for controlling use of context information of a user includes establishing a context policy enforcement engine on a mobile computing device. The context policy enforcement engine may be embodied as software and/or hardware components. The context policy enforcement engine retrieves context policy data in response to receiving a request for context information related to a user. The context policy data defines a set of context rules for responding to context requests. The context policy enforcement engine responds to the request based on the set of context rules.

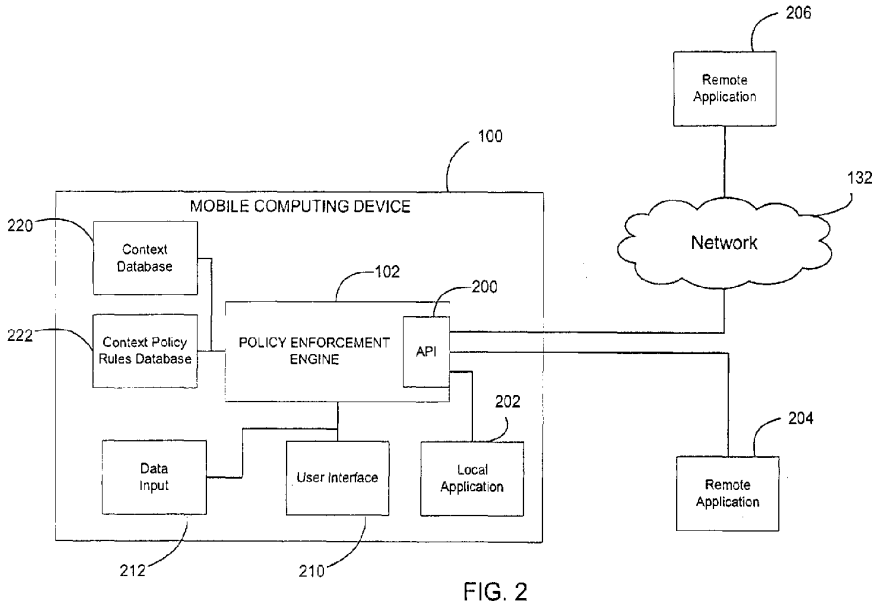


FIG. 2

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Description

BACKGROUND

[0001] Location-aware computing allows computing devices, especially mobile computing devices such as cellular phones and mobile computers, to perform various functions based on the location of the location-aware enabled computing device. Such functions may include, for example, adapting user interfaces, tailoring software applications and/or application data, and publishing data related to or based on the location of the computing device. Additionally, other devices remote from the location-aware enabled computing device may interact with the enabled device to obtain location information and perform remote functions based on such location information such as publishing the location of the user of the device.

[0002] The location of a computing device may be derived from the device itself (e.g., the computing device includes global positioning system (GPS) circuitry) or may be calculated based on functions or use of the device. In typical location-aware computing devices and associated systems, no control of the dissemination of the location information is available. As such, the use of the location information may be publicly available with little control or, in some cases, knowledge by the user of the computing device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] The invention described herein is illustrated by way of example and not by way of limitation in the accompanying figures. For simplicity and clarity of illustration, elements illustrated in the figures are not necessarily drawn to scale. For example, the dimensions of some elements may be exaggerated relative to other elements for clarity. Further, where considered appropriate, reference labels have been repeated among the figures to indicate corresponding or analogous elements.

[0004] FIG. 1 is a simplified block diagram of one embodiment of a mobile computing device for controlling use of context information of a user;

[0005] FIG. 2 is a simplified block diagram of a software environment of the mobile computing device of FIG. 1;

[0006] FIG. 3 is a simplified data structure of one embodiment of a context database;

[0007] FIG. 4 is a simplified data structure of one embodiment of a context policy database; and

[0008] FIG. 5 is a simplified flow diagram of one embodiment of a method for controlling use of context information of a user executed by the mobile computing device of FIG. 1.

DETAILED DESCRIPTION OF THE DRAWINGS

[0009] While the concepts of the present disclosure are susceptible to various modifications and alternative forms, specific exemplary embodiments thereof have been shown by way of example in the drawings and will herein be described in detail. It should be understood, however, that there is no intent to limit the concepts of the present disclosure to the particular forms disclosed, but on the contrary, the intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the invention as defined by the appended claims.

[0010] In the following description, numerous specific details such as logic implementations, opcodes, means to specify operands, resource partitioning/sharing/duplication implementations, types and interrelationships of system components, and logic partitioning/integration choices are set forth in order to provide a more thorough understanding of the present disclosure. It will be appreciated, however, by one skilled in the art that embodiments of the disclosure may be practiced without such specific details. In other instances, control structures, gate level circuits and full software instruction sequences have not been shown in detail in order not to obscure the invention. Those of ordinary skill in the art, with the included descriptions, will be able to implement appropriate functionality without undue experimentation.

[0011] References in the specification to "one embodiment", "an embodiment", "an example embodiment", etc., indicate that the embodiment described may include a particular feature, structure, or characteristic, but every embodiment may not necessarily include the particular feature, structure, or characteristic. Moreover, such phrases are not necessarily referring to the same embodiment. Further, when a particular feature, structure, or characteristic is described in connection with an embodiment, it is submitted that it is within the knowledge of one skilled in the art to effect such feature, structure, or characteristic in connection with other embodiments whether or not explicitly described.

[0012] Embodiments of the invention may be implemented in hardware, firmware, software, or any combination thereof. Embodiments of the invention implemented in a computer system may include one or more bus-based interconnects between components and/or one or more point-to-point interconnects between components. Embodiments of the invention may also be implemented as instructions stored on a machine-readable medium, which may be read and executed by one or more processors. A machine-readable medium may include any mechanism for storing or transmitting information in a form readable by a machine (e.g., a computing device). For example, a machine-readable medium may include read only memory (ROM); random access memory (RAM); magnetic disk storage media; optical storage media; flash memory devices; and others.

[0013] Referring now to FIG. 1, a mobile computing device 100 configured to control use of context data related to a user of the device 100 includes a context policy enforcement engine 102, a processor 104, a chipset 106, and memory 108. The computing device 100 may be embodied as any type of portable computing device ca-

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pable of performing the functions described herein. For example, in some embodiments, the computing device 100 is embodied a cellular phone, a personal data assistant, a laptop computer, a mobile internet device, or other computer-based mobile device.

[0014] The context policy enforcement engine 102 may be embodied as a plurality of components including hardware components, firmware components, and software components that interact cooperatively to provide amount of privacy and control over context data related to a user of the device 100 as described in more detail herein. As such, the context policy enforcement engine 102 may include a dedicated hardware processor and/or other circuitry separate from the processor 104 of the device 100. Additionally, the policy enforcement engine may include firmware instructions configured to initialize or otherwise "boot" the policy enforcement engine in a secured environment. In some embodiments, the policy enforcement engine 102 may include or otherwise be communicatively coupled to memory (not shown) separate from the main memory 108 for increased security.

[0015] The processor 104 is illustratively embodied as a single core processor having a processor core 110. However, in other embodiments, the processor 104 may be embodied as a multi-core processor having multiple processor cores 110. Additionally, the computing device 100 may include additional processors 104 having one or more processor cores 110. The processor 104 is communicatively coupled to the chipset 1106 via a number of signal paths 112. The signal paths 112 may be embodied as any type of signal paths capable of facilitating communication between the processor 104 and the chipset 106. For example, the signal paths 112 may be embodied as any number of wires, printed circuit board traces, via, bus, intervening devices, and/or the like. The chipset 106 may include a memory controller hub (MCH) or northbridge, an input/output controller hub (ICH) or southbridge, and a firmware device. In such embodiments, the firmware device may be embodied as a memory storage device for storing Basic Input/Output System (BIOS) data and/or instructions and/or other information.

[0016] The chipset 106 is communicatively coupled to the memory 108 via a number of signal paths 114. Similar to the signal paths 112, the signal paths 114 may be embodied as any type of signal paths capable of facilitating communication between the chipset 111222 and the memory device 108 such as, for example, any number of wires, printed circuit board traces, via, bus, intervening devices, and/or the like. The memory 108 may be embodied as one or more memory devices or data storage locations including, for example, dynamic random access memory devices (DRAM), synchronous dynamic random access memory devices (SDRAM), double-data rate dynamic random access memory device (DDR SDRAM), and/or other volatile memory devices. Additionally, although only a single memory device 108 is illustrated in FIG. 1, in other embodiments, the mobile computing device 100 may include additional memory devices.

[0017] In some embodiments, the computing device 100 may include a data storage device(s) 118, one or more peripheral devices 120, and communication circuitry 124. In such embodiments, the chipset 106 is also communicatively coupled to the data storage device(s) 118 peripheral devices 120, communication circuitry 124, and the context policy enforcement engine 102 via signal paths 116. Again, similar to the signal paths 112, 114, the signal paths 116 may be embodied as any type of signal paths capable of facilitating communication between the chipset 112 and the data storage device(s) 118 peripheral devices 120, communication circuitry 124, and the context policy enforcement engine 102 such as, for example, any number of wires, printed circuit board traces, via, bus, intervening devices, and/or the like.

[0018] The data storage device(s) 118 may be embodied as any type of device configured for the short-term or long-term storage data such as, for example, memory devices and circuits, memory card, hard disk drives, solid-state drive, or other data storage device. The peripheral devices 120 may include any number of peripheral devices including input devices, output devices, and other interface devices. For example, the peripheral devices 120 may include a display screen and keyboard of the computing device 100. The particular devices included in the peripheral devices 120 may depend upon, for example, the intended use of the computing device. The communication circuitry

[0019] The communication circuitry 124 may be embodied as any number of devices and circuitry for enabling communications between the mobile computing device 100 and one or more remote devices. For example, the communication circuitry 124 may include one or more wired or wireless network interfaces to facilitate wired or wireless communications with the remote devices 130, 140. In some embodiments, a remote device 130 may communicate with the mobile computing device 100 over a communication path 132, which may be wired and/or wireless. Additionally or alternatively, a remote device 140 may communicate with the mobile computing device 100 over a communication path 142, which may be wired and/or wireless, via a network 1344.

[0020] The network 144 may be embodied as any type of wired and/or wireless network such as a local area network, a wide area network, a publicly available global network (e.g., the Internet), or other network. Additionally, the network 144 may include any number of additional devices to facilitate the communication between the mobile computing device 100 and the remote device 140 such as routers, switches, intervening computers, and the like. The remote devices 130, 140 may be embodied as any type of computing devices separate from the computing device 100. For example, the remote devices 130, 140 may be embodied as one or more computers, mobile devices such as laptops, cell phones, and mobile internet devices, or other computing devices configured to communicate with the mobile computing device 100.

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[0021] In some embodiments, the mobile computing device 100 may also include one or more sensors 150 communicatively coupled to the context policy enforcement engine 102 via signal paths 152. Similar to the signal paths 112, 114, 116, the signal paths 152 may be embodied as any type of signal paths capable of facilitating communication between the sensors 150 and the policy enforcement engine 102. The sensors 150 may be embodied as any type of sensor or sensor network configured to determine one or more parameters of the context of a user. For example, the sensors 150 may be embodied as any number of location sensors for determining the location of the user, biometric sensors for determining biometric data of the user, temperature sensors, altitude sensors, radio frequency identification (RFID) transmitters and/or receivers, data scanners or readers, and/or other sensors and/or devices for configured to sense or otherwise gather data indicative of a parameter of the context of the user. Further, it should be appreciated that the computing device 100 may include other components, sub-components, and devices not illustrated in FIG. 1 for clarity of the description.

[0022] As discussed above, the computing device 100 is configured to facilitate control of the use of context information of the user. For example, the computing device 100 may control the use of context information requested by the remote devices 130, 140 and/or otherwise provided by the mobile computing device 100 and/or other devices and/or sensors. The context information may include any information or data that defines the context of the user such as, for example, the location, activity, or environment of the user. For example, in some embodiments, the context of the user may be defined by a plurality of context parameters that each defines a particular aspect of the context of the user at a particular point in time. Such context parameters may include, for example, the location of the user, the current activity of the user, environmental data of the environment in which the user is located, biometric data of the user, and the like. Additionally, each context parameter may have one or more characteristics associated therewith that define the level of specificity of the context parameter. Such characteristics may include, for example, the granularity of the context parameter data (e.g., what city is the user located in , what building is the user located in, what are the GPS coordinates of the user, etc.), the confidence of the context parameter (e.g., what is the likelihood that the context parameter data is accurate, what data collection methods were used, etc.), and the currency of the context parameter data (e.g., when was the data collected, how old is the data, when is the next context update, etc.). Of course, it should be appreciated that the context of the user may be defined other context schemas, data structures, and data in other embodiments.

[0023] Referring now to FIG. 2, in use, the mobile computing device 100 includes a plurality of software modules, applications, and/or programs to facilitate control of the use of context information of the user. As discussed above, the context policy enforcement engine 102 may be embodied as hardware, firmware, and/or software modules and devices. In the illustrative embodiment, the context policy enforcement engine 102 includes an application program interface 200 to facilitate interaction between the context policy enforcement engine 102 and local applications 202 and/or remote applications 204, 206. The local applications 202 may be embodied as any software or firmware applications executed on the mobile computing device 100 that request context information related to the user of the device 100. Similarly, the remote applications 204, 206 may be embodied as any software or firmware applications executed on the remote devices 130, 140 that request context information related to the user of the device 100. The remote application 204 may request such context information from the mobile computing device 100 over the communication path 132 and the remote application 206 may request the context information from the device 100 over the communication path 142.

[0024] The mobile computing device 100 also includes a context database 220 and a context policy database 222. The databases 220, 222 may be embodied as data stored in a suitable data structure and location such as, for example, a relational database, a flat file database, or data stored in the memory 108 and/or data storage 118. In some embodiments, the context database 220 and/or the context policy database 222 may be encrypted or otherwise include some form of security.

[0025] The context data may be stored in the context database 220 in any suitable data form or schema. For example, one embodiment of a data structure or schema 300 for storing the context data related to the user is shown in FIG. 3. As discussed above, in some embodiments, the context of the user may be defined by a plurality of context parameters (e.g., location, activity, environmental aspects, etc.), each having an associated characteristic (e.g., granularity, confidence, currency, etc.). For each parameter-characteristic combination, context data of varying levels of specificity may be stored or otherwise determined such that requests for context data may be responded to with context data having a selected level of specificity as desired by the user. For example, in one embodiment, the context data structure 300 may include context data 302 that defines three levels of specificity for the granularity characteristic of the location context parameter. As shown, the location granularity includes a high granularity level indicating that the user is at a particular GPS coordinate location, a middle granularity level indicating that the user is inside a particular building at work, and a low granularity level indicating that the user is simply at work. As discussed in more detail below, the user and/or policy enforcement engine 102 may select the level of specificity of the context data to provide the requesting application or entity based on the context policy rule data. As such, the user may decide to provide only low level of granularity of the location of the user to, for example, publicly available

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applications (e.g., a Twitter® application). Alternatively, the user or computing device 100 may decide to provide a high level of granularity of the location of the user if the requesting application is an application at work or from a family member as discussed in more detail below.

[0026] The illustrative context data structure 300 also includes a context data 304 that defines three levels of specificity for the confidence characteristic of the location context parameter. The illustrative confidence characteristic includes a high granularity level indicating the user swiped his RFID tag at an entry door to a particular room, which provides a high degree of confidence that the user is actually within the room or at a GPS coordinate within the room. The illustrative confidence characteristic also includes a middle granularity level indicating that the user swiped his RFID inside at an entry door to a particular building at work, which provides a degree of confidence that the user is within that particular building. Additionally, the illustrative confidence characteristic includes a low confidence level indicating the user accessed a wireless access point that includes the building (but may include other buildings within the work campus area).

[0027] The illustrative context data structure 300 additionally includes a context data 306 that defines three levels of specificity for the currency of the location context parameter. The illustrative currency characteristic includes a high currency level indicating that a room entry door RFID scanner was activated recently, a middle currency level indicating that a wireless access point was accessed a particular time prior to the high currency level event, and a low currency level indicating that the user activated the entry door RFID scanner to the building earlier that morning.

[0028] The illustrative context data structure 300 may include additional data related to additional context parameters the define the context of the user of the mobile computing device 100. For example, as shown in FIG. 3, the context data structure may include context data 308 defining the granularity characteristic of the activity context parameter, a context data 310 defining the confidence characteristic of the activity context parameter, a context data 320 defining the currency characteristic of the activity context parameter, and any other context data used to define the current or historical context of the user. It should be appreciated, however, that the context data structure 300 is just one of several data schema that may be used to store the context data related to the user. In other embodiments, other data structures or schema may be used. For example, in some embodiments, the context data may be stored with more or less levels of specificity for each context parameter, without use of context parameter characteristics (e.g., the context location parameter is defined simply as the GPS coordinates the user, the building in which the user is currently located, etc.), or using some other data stricture or schema depending on the particular application and implementation of the mobile computing device 100. Additionally, in some embodiments, the context data of the user may not be stored, but rather collected on an "as needed" basis. For example, the location of the user of the mobile computing device may be determined upon receipt of a request for the context data rather than prior thereto.

[0029] The context policy database 220 includes a set of context policy rules that define how the computing device 100 is to respond to requests for context information of the user from, for example, the applications 202, 204, 206. The context policy rules may dictate how to respond to the context request based on any appropriate data such as data related to the requesting entity (e.g., which application is requesting the data, the identity of the requesting entity, etc.), current or historical context data (e.g., the current location or activity of the user), or other data related to the context of the user (e.g., the time of day, day of the week, etc.). As described above, in some embodiments, the context data may include multiple levels of specificity of context data and, in such embodiments, the context policy rules may define which level of specificity (e.g., which level of location granularity) is to be provided to the requesting application or entity.

[0030] The context policy rules may be embodied as any type of rule, collection of rules, and/or the like that define how the computing device 100 should respond to various requests for context data. As discussed above, the rule decisions may be based on various parameters and/or data including, but not limited to, the type of application requesting the context data, the identification of the requesting entity, the location of the requesting entity, the predefined group with which the requesting entity/application is associated, other context data of the user, and/or other environmental or other data that defines the context of the user. Additionally, the structure of the context policy rules may varying depending on the application and implementation of the mobile computing device 100.

[0031] One illustrative embodied of a context policy rule schema or data structure 400 is illustrated in FIG. 4. The illustrative context policy rule schema 400 includes a plurality of context policy rules 402, 404, 406, 408, 410, 412 that define how the computing device 100 should respond to requests for context data (e.g., what content of context data should be delivered to the requesting application or entity). For example, context policy rule 402 defines the level of specificity for each characteristic for the location parameter of the context of the user. In this embodiment, if the requesting entity (e.g., application, company, or individual) belongs to the a group called "work" and if the user of the computing device 100 is current at work, then the context data defined as having a high confidence, high granularity, and high currency may be provided to the requesting application or entity. As discussed above, in some embodiments, the context data stored in the context database 220 may include data entries for each level of specificity. However, in other embodiments, the context data may be determined based on the policy rule 402 in response to the request for context data. That is, the context policy rule 402 de-

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fines the level of specificity of the context parameter that must be determined to respond to the request.

[0032] In some embodiments, the context policy rules 400 may also include binary type rules that allow or disallow access to particular context data, rather than defining the specificity of the data or the data itself. For example, the context policy rule 402 includes a definition for the access characteristic of the activity context parameter that allows applications in the group "work" to have access to the context data related to the activity of the user when the user is located at "work." Additionally, the context policy rules 400 may include other rules such as policy rules 404 and 406 that define how the mobile computing device 100 should respond to requests from entities associated with other groups such as the group "family" and the group "public." Such groups may be defined be predefined, defined by the user, or defined by the requesting application or entity.

[0033] In some embodiments, the context policy rules 400 may also define an action to be taken by the mobile computing device 100 in addition to or in place of context data. For example, the context policy rule 406 defines the confidence characteristic of the location parameter as requiring a token to prove the location of the user. As such, the mobile computing device 100 may be configured to transmit a software token that was previously received as proof of the location of the user to the requesting application/entity (e.g., remote applications 204, 206). Additionally, the context policy rules 400 may use any number of rule qualifiers to define the rule itself. For example, the context policy rule 412 defines context data that should be provided to a requesting application if the requesting person is identified as "spouse", the user's activity is "shopping", and the user is currently located in a location identified as "flower shop." As shown, the context policy rule 412 provides a low granularity for the location parameter such that the requesting entity cannot determine exactly where the user is (e.g., so as not to run a well planned surprise). Although the context policy rules 400 define an illustrative set of context policy rules, it should be appreciated that the context policy rules may include additional or other context policy rules having the same or other rule form may be used. Additionally, in some embodiments, the context database 220 and the context policy database 222 may be combined in a single database in which the context policy rules directly define or identify the context data to be used to respond to a request for context data of the user given the particular qualifiers identified in each context policy rule.

[0034] Referring back to FIG. 2, the mobile computing device 100 may additionally include a user interface 210, which is usable by the user to interact with the policy enforcement engine 102, the context database 220, and/or the context policy database 222. The user interface 210 may be embodied as any suitable user interface, such as a graphical user interface (GUI), that facilitates interaction between the user and the mobile computing device 100. The user interface 210 may be configured, for example, to allow the user to add, delete, update, or otherwise modify the context policy rules included in the context policy rule database. For example, the user may decide to allow access all applications in the "public" group to location context data having high granularity. If so, the user may interact with the user interface to update the associated context policy rule. Additionally, the user may define which requesting applications or entities below to which group or otherwise define groups or associations of applications and entities with which various context policy rules may be created and defined.

[0035] In some embodiments, the policy enforcement engine 102 may allow the user to update context data related to the user and stored in the context database. For example, in certain circumstances, some of the context data may be unavailable through automatic collection means (e.g., location via a GPS sensor). In such cases, the user may supply, update, modify, or correct the context data or otherwise add additional details related to the context data via use of the user interface. For example, if the user is at a particular flower shop, the user may enter the name of the flower shop rather than the generic "flower shop" location tag such that authorized requesting applications have access to more specific or other an increased amount of context data.

[0036] In some embodiments, the mobile computing device 100 may also include a data input 212, which may be embodied as any type of data input the delivers context data to the policy enforcement engine 102. For example, in embodiments wherein the mobile computing device 100 includes sensor(s) 150, the data input 212 may be embodied as the sensor data from such sensors 150. For example, the sensors 150 may provide contextual data related to the user's environment, such as temperature, altitude, or location, to the policy enforcement engine 102. In response, the policy enforcement engine 102 updates the context data stored in the context database 222.

[0037] Referring now to FIG. 5, in use, the mobile computing device 100 may be configured to execute a method 500 for controlling use of context data related to a user of the device 100. The method 500 may be executed by, for example, the policy enforcement engine 102 and/or the processor 104. The method 500 begins with step 502 in which a request for user context is received from an application such as the local application 202 or remote applications 204, 206. In block 504, the computing device 100 may be configured to validate the context request based on the context policy rules stored in the context policy rule database 222. The request for user context may be validated by any suitable mechanism to ensure that the request is for context data of the user of the device 100 and is otherwise authorized to receive context data of some level of specificity. As such, the user of the device 100 may simply ignore or otherwise refuse to respond to requests for context data received from particular requesting applications or entities, during particular time

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periods of the day, on particular days, or based on some other predetermined criteria.

[0038] If the request is not authorized in block 506, the method 500 loops back to block 502. However, if the request for context data is authorized in block 506, the context data is determined in block 508 based on or according to the context policy rules stored in the context policy rule database 222. That is, the context data that is to be provided to the requesting application or entity is determined in block 508. As discussed above, one or more context policy rules of the context policy rule database 222 may be used to determine which and how much of the context data stored in the context database 220 should be provided to the requesting application/entity. For example, referring to the illustrative embodiment of FIGS. 3 and 4, if the requesting application belongs to group "public" and the user is currently in the location defined as "work," the parameter characteristic is defined as LOW and as such the context location that may be provided to the requesting application is identified as "Work" in the context data 300.

[0039] Referring back to FIG. 5, in block 510, the mobile computing device 100 responds to the requesting application or entity with the context data determined in block 508. To do so, the mobile computing device 100 may be configured to transmit the context data to the requesting application in sub-block 512. Additionally or alternatively, if the context policy rule defines an action or restriction of an action, the mobile computing device 100 may be configured to authorize or deny the requested action in 514. For example, in embodiments wherein the mobile computing device 100 is embodied as a cellular telephone and the context policy rules dictate that no ringer should be used when the user's current activity context is defined as "meeting," a local ringer application executed on the device 100 may request authorization to activate the ringer of the cell phone from the policy enforcement engine 102. In response, the policy enforcement engine would authorize or deny the ringer application based on the location of user at the time of the request (i.e., based on the context policy rules and the context data of the user). As such, the mobile computing device 100 is configured to control the user of context information related to the user by establishing a context policy engine 102 that determines the response to such request based on a set of policy rules included in the context policy rule database 222.

[0040] While the disclosure has been illustrated and described in detail in the drawings and foregoing description, such an illustration and description is to be considered as exemplary and not restrictive in character, it being understood that only illustrative embodiments have been shown and described and that all changes and modifications that come within the spirit of the disclosure are desired to be protected.

Claims

1. A method comprising:

   establishing a context policy enforcement engine on a mobile computing device;
   retrieving context policy data with the context policy enforcement engine in response to receiving a request for context information related to a user of the mobile computing device, the context policy data defining a set of rules for responding to context requests; and
   responding to the request for context information based on the context policy data.

2. The method of claim 1, wherein establishing a context policy enforcement engine comprises establishing the context policy enforcement engine either in a secured boot environment or in software.

3. The method of claim 1, wherein retrieving context policy in response to receiving the request for context information comprises retrieving context policy in response to one of receiving the request for context information from a software application, receiving a request for at least one of: a location of the user, an activity of the user, an aspect of the environment in which the user is located, and biometric data related to the user, or receiving a request for (i) the location of the user and (ii) at least one additional context parameter related to the user.

4. The method of claim 1, wherein:

   retrieving context policy in response to receiving the request for context information comprises retrieving context policy in response to receiving the request from a requesting entity; and
   the context policy data defines a context policy rule based on the identification of the requesting entity.

5. The method of claim 4, wherein the context policy data defines a rule based on a predetermined group of requesting entities.

6. The method of claim 1, wherein the context policy data defines a rule based on one of a context parameter associated with the user, the requested context information and a location of the user at the time of receiving the request for context information, the requested context information and the time of day at which the request for context information is received, or the requested context information and an activity of the user.

7. The method of claim 1, wherein responding to the request comprises determining context data based

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on the set of rules of the context policy data.

8. The method of claim 7, wherein responding to the request further comprises retrieving the context data from a context database with the context policy enforcement engine based on the set of rules of the context policy data and transmitting the context data.

9. The method of claim 7, wherein determining the context data comprises selecting context data from a plurality of datum defining a context parameter of the user, the plurality of datum having different levels of specificity defined in the set of rules of the context policy data.

10. The method of claim 7, wherein:

a context of the user is defined by a plurality of context parameters and the context policy data defines the set of rules based on a plurality of parameter characteristics associated with each context parameter, and the method includes a step of :
determining the context data comprises determining the context data for at least one of the parameter characteristics defined in the context policy data.

11. The method of claim 1, further comprising:

receiving user-supplied context policy rule with the mobile computing device, and
updating the context policy data with the user-supplied context policy rule with the context policy enforcement engine.

12. The method of claim 1, further comprising:

receiving user-supplied context data related to the user with the mobile computing device, and
updating a context database stored on the mobile computing device with the user-supplied context data.

13. The method of claim 1, further comprising:

receiving context data related to the user from a source remote to the mobile communication device; and
updating a context database stored on the mobile computing device with the user-supplied context data.

14. A machine readable medium comprising a plurality of instructions, that in response to being executed, result in a computing device performing the method of any claim 1-10.

15. A mobile computing device comprising:

a context policy enforcement engine;
a processor; and
a memory device having stored therein a plurality of instructions, which when executed by the processor, cause the context policy enforcement engine to:
retrieve context policy data in response to receiving a request for context information related to a user of the computing device, the context policy data defining a set of rules for responding to context requests;
determine context data related to a user of the mobile computing device based on the set of rules of the context policy data; and
respond to the request for context information with the determined context data.

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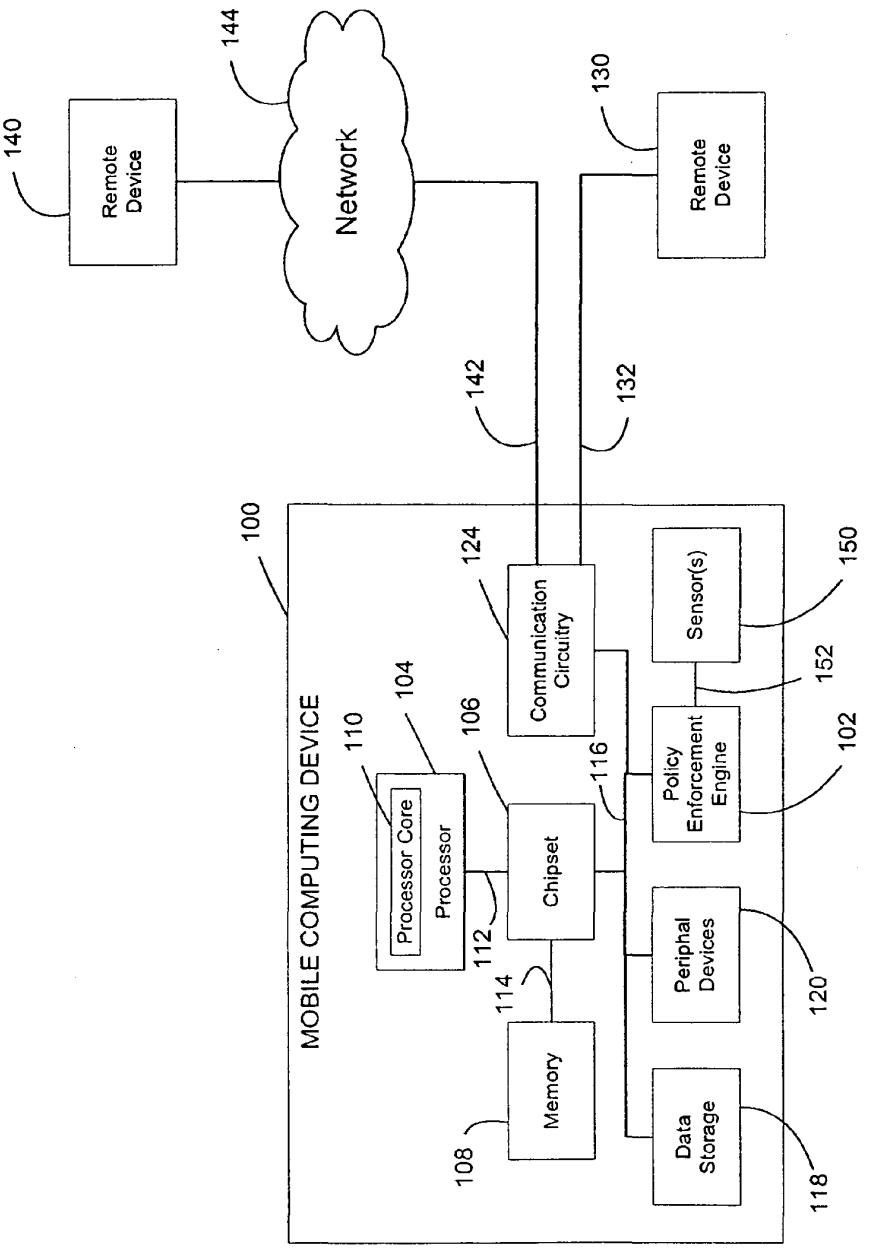


FIG. 1

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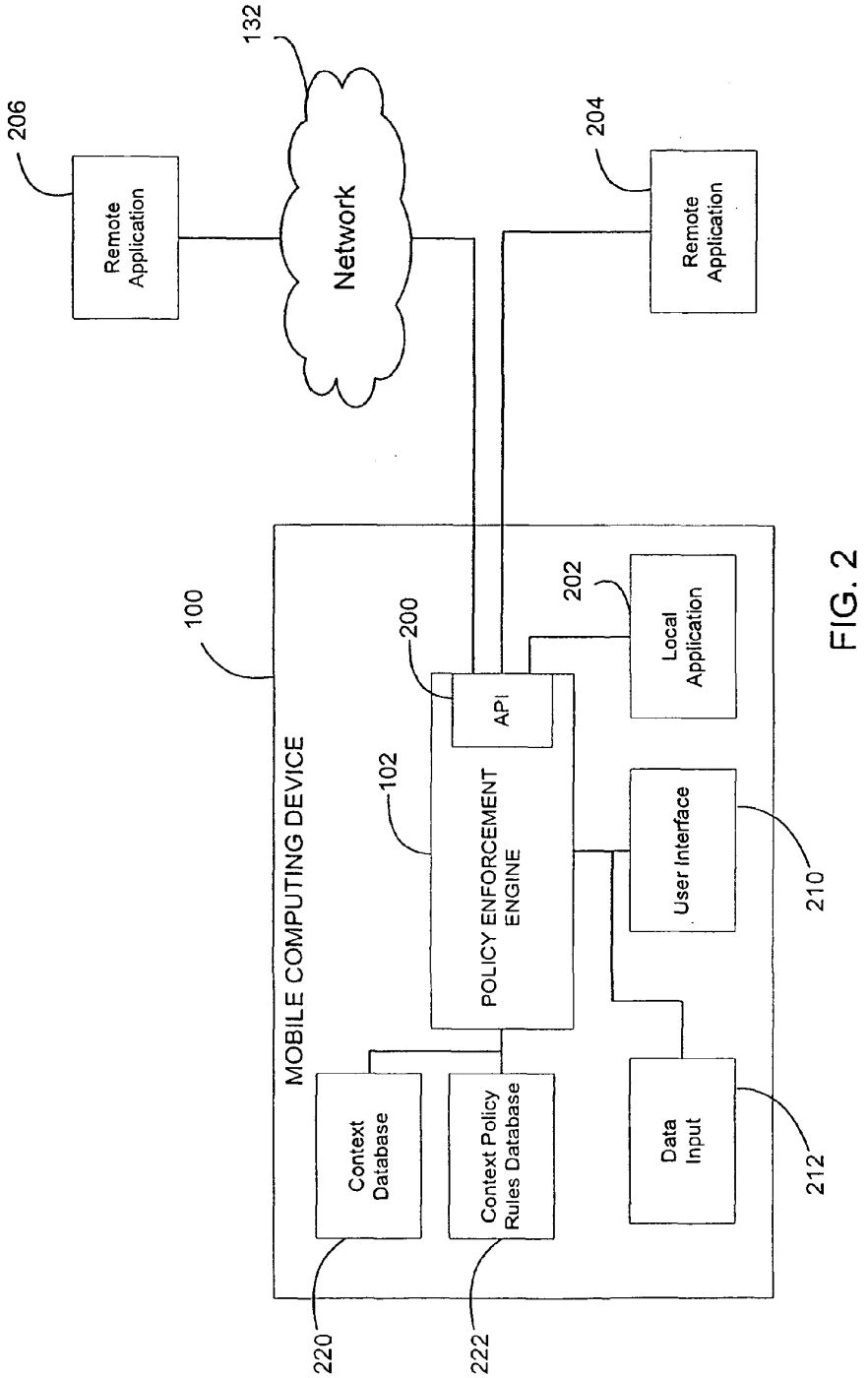


FIG. 2

Petitioner Samsung Ex-1004, 0192

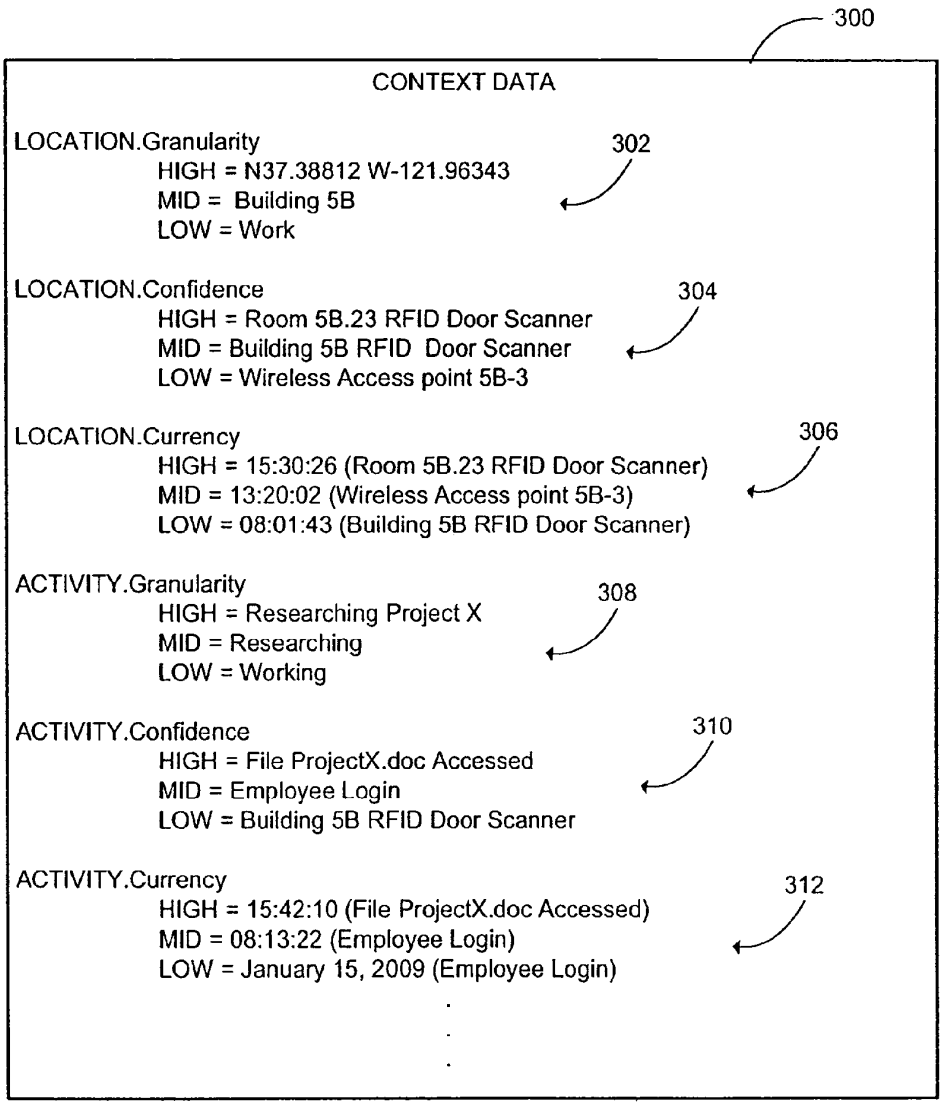


FIG. 3

Petitioner Samsung Ex-1004, 0193

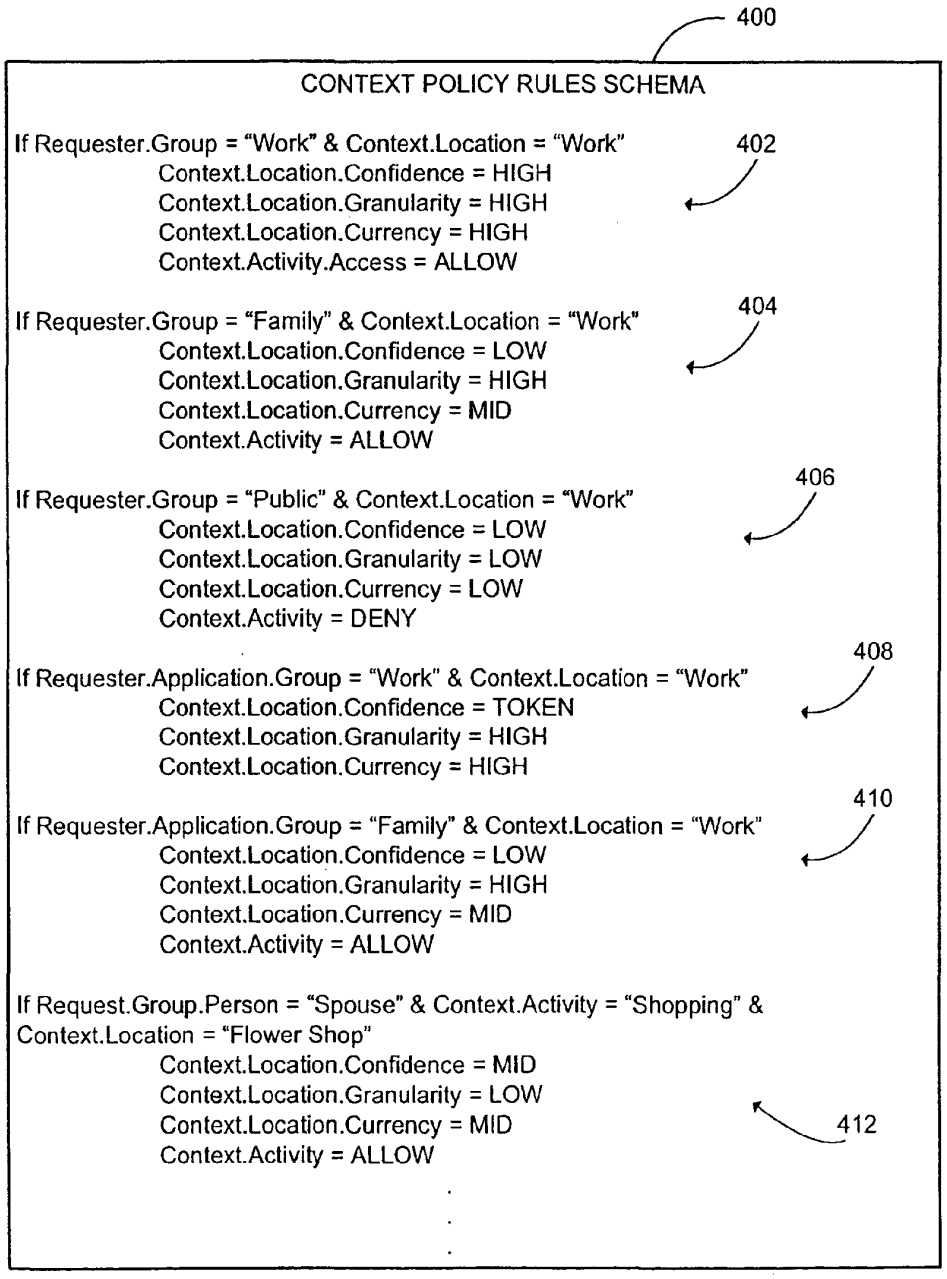


FIG. 4

Petitioner Samsung Ex-1004, 0194

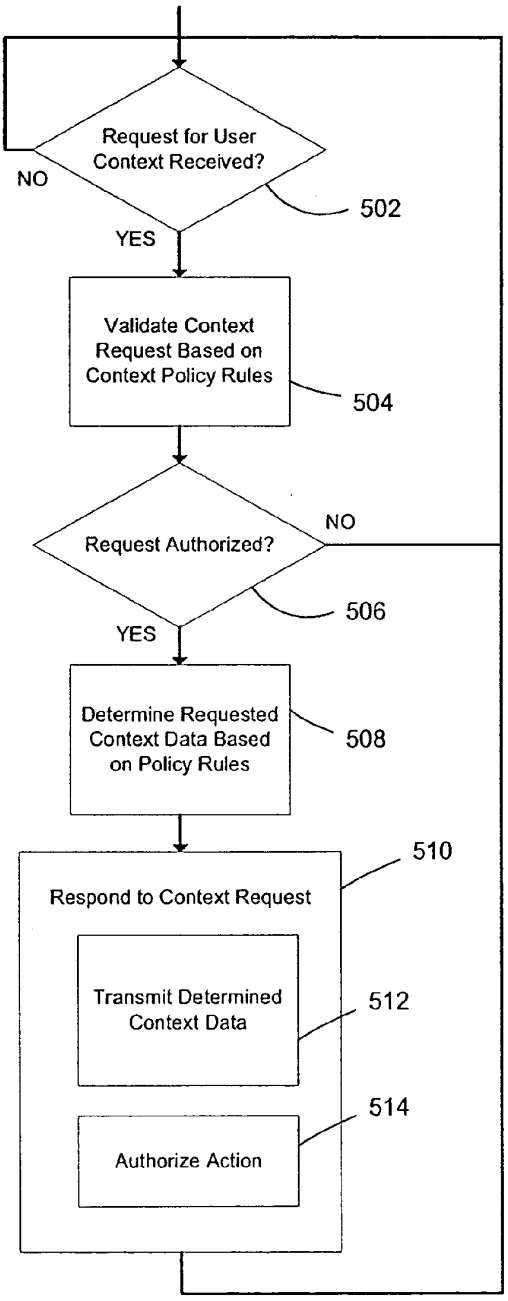


FIG. 5

Petitioner Samsung Ex-1004, 0195

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 10 25 1637

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2006/106303 A1 (BRITISH TELECOMM [GB]; LEE HABIN [GB]) 12 October 2006 (2006-10-12) * page 4, line 5 - page 8, line 8 * * page 9, line 10 - page 11, line 30 * * page 13, line 6 - page 16, line 11 * * page 22, line 32 - page 24, line 4 * * claims 1-13 *	1-15	INV. H04M1/725
X	US 2005/003804 A1 (HUOMO HEIKKI [FI] ET AL) 6 January 2005 (2005-01-06) * paragraph [0010] - paragraph [0011] * * paragraph [0031] - paragraph [0055] *	1-15	
X	EP 1 217 857 A2 (MICROSOFT CORP [US]) 26 June 2002 (2002-06-26) * paragraph [0009] - paragraph [0024] * * paragraph [0096] - paragraph [0103] *	1-15	
X	US 2002/174073 A1 (NORDMAN IAN [FI] ET AL NORDMAN IAN [FI] ET AL) 21 November 2002 (2002-11-21) * abstract * * paragraph [0008] - paragraph [0013] * * paragraph [0055] - paragraph [0056] * * paragraph [0064] - paragraph [0072] * * paragraph [0115] - paragraph [0131] * * paragraph [0180] - paragraph [0184] * * claims 1-20 *	1-15	TECHNICAL FIELDS SEARCHED (IPC) H04M H04L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 February 2011	Maciejewski, Robert

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

Petitioner Samsung Ex-1004, 0196

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 25 1637

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-02-2011

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2006106303 A1	12-10-2006	US 2009234958 A1	17-09-2009
US 2005003804 A1	06-01-2005	NONE	
EP 1217857 A2	26-06-2002	JP 4334796 B2	30-09-2009
		JP 2002334030 A	22-11-2002
		US 2002120370 A1	29-08-2002
		US 2005071489 A1	31-03-2005
		US 2005080902 A1	14-04-2005
		US 2005055430 A1	10-03-2005
		US 2005050201 A1	03-03-2005
		US 2005091408 A1	28-04-2005
		US 2005080555 A1	14-04-2005
US 2002174073 A1	21-11-2002	AU 2002302883 A1	16-12-2002
		EP 1440356 A2	28-07-2004
		EP 1962169 A1	27-08-2008
		WO 02099556 A2	12-12-2002

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

Petitioner Samsung Ex-1004, 0197

Electronic Acknowledgement Receipt

EFS ID:	10132284
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett/Darcy Kobylarczyk
Filer Authorized By:	Glen Madison Kellett
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	19-MAY-2011
Filing Date:	25-SEP-2009
Time Stamp:	22:55:10
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed (SB/08)	P31880_IDS_05_19_11.pdf	611730 a7941f66fa6c3a1ad93235c0c74c1c7dc07a72f0	no	4
Warnings:					
Information:					

A U.S. Patent Number Citation or a U.S. Publication Number Citation is required in the Information Disclosure Statement (IDS) form for autoloading of data into USPTO systems. You may remove the form to add the required data in order to correct the Informational Message if you are citing U.S. References. If you chose not to include U.S. References, the image of the form will be processed and be made available within the Image File Wrapper (IFW) system. However, no data will be extracted from this form. Any additional data such as Foreign Patent Documents or Non Patent Literature will be manually reviewed and keyed into USPTO systems.

2	NPL Documents	P31880EP_OA_3_22_2011.pdf	737850 93fe3c5c73ddeb528a47148d4f150df9a4f15ab0	no	7
Warnings:					
Information:					
3	Foreign Reference	P31880_EP2302886A1.pdf	2113942 aaf717fbb64267eaddb884d4fc6f778f9ef4dd0b	no	15
Warnings:					
Information:					
			Total Files Size (in bytes):	3463522	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

U.S.PATENTS						
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					
If you wish to add additional U.S. Patent citation information please click the Add button.						

U.S.PATENT APPLICATION PUBLICATIONS						
Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050060575	A1	2005-03-17	Trethewey, et al.	
If you wish to add additional U.S. Published Application citation information please click the Add button.						

FOREIGN PATENT DOCUMENTS								
Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐
If you wish to add additional Foreign Patent Document citation information please click the Add button								

NON-PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

Petitioner Samsung Ex-1004, 0200

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Christopher A. Singh/	Date (YYYY-MM-DD)	2011-07-20
Name/Print	Christopher A. Singh	Registration Number	61,236

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Petitioner Samsung Ex-1004, 0203

Electronic Acknowledgement Receipt

EFS ID:	10565700
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Christopher A. Singh/Jenny Mundt
Filer Authorized By:	Christopher A. Singh
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	21-JUL-2011
Filing Date:	25-SEP-2009
Time Stamp:	10:57:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	P31880_IDS.pdf	31265 12c5ba8c62d7be4678e2e00377e71b46af1c1d34	no	4
Warnings:					
Information:					

This is not an USPTO supplied IDS fillable form	
Total Files Size (in bytes):	31265

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480	4223

73486 7590 11/10/2011

Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

EXAMINER	
YALEW, FIKREMARIAM A	
ART UNIT	**PAPER NUMBER**
2436	

MAIL DATE	DELIVERY MODE
11/10/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Petitioner Samsung Ex-1004, 0206

Office Action Summary	Application No.	Applicant(s)	
	12/567,386	KOHLENBERG ET AL.	
	Examiner	Art Unit	
	FIKREMARIAM A. YALEW	2436	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 September 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-25* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-25* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *25 September 2009* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Petitioner Samsung Ex-1004, 0207

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :07/21/2011,05/19/2011,04/282011,10/12/2009.

Petitioner Samsung Ex-1004, 0208

DETAILED ACTION

1. Claims 1-25 are pending and have been examined.

Oath/Declaration

2. The Oath/declaration filed on 11/30/2009 are accepted by the examiner

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 07/22/2011, 05/20/2011, 04/28/2011, 10/13/2009 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawing

4. The drawings filed on 09/25/2009 are accepted by the examiner.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 21-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

7. Claims 21-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Currently, claims 21-24 are drawn to a machine readable medium comprising computer executable instruction. The term “medium" however under broadest interpretation includes a transitory signal for which the office considers to be non-

statutory subject matter. As such the Examiner is suggested to include either in claim language or in the specification subject matter reciting that the medium does not include a signal or to include "non-transitory or computer storage device" in the claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims are 1-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Lin et al (hereinafter referred as Lee) WO 2006/106303.

10. As per claims 1, 21: Lee teaches a method/computing device comprising: establishing a context policy enforcement engine on a mobile computing device(See page 5 lines 23-25 and col.11 lines 1-9(i.e, **producing context information from the received context data according to a predetermined rule-set including a plurality of rules & the system for processing context data may be implemented on one or more computing devices**)); receiving a request for context information related to a user of the mobile computing device, retrieving context policy data with the context policy enforcement engine(See page 7 lines 23-25 and col.11 lines 1-9(i.e. **where the rule-source specifies a rule for the processing of context data to produce the context information, the system can incorporate the additional rules which implement the notification of an application request for context information**)), the context policy data defining a set of rules for responding to context requests(See page 5 lines 23-25(i.e., **a predetermined rule-set including a plurality of rules**)); and responding to the request for

context information based on the context policy data(See page 5 lines 25-26(i.e., **communicating the context information to at least one application**)).

2. As per claim 2: Lee teaches the method wherein establishing a context policy enforcement engine comprises establishing the context policy enforcement engine in a secured boot environment (See page 14 lines 16-20).

3. As per claim 3: Lee teaches the method wherein the establishing the context policy enforcement engine comprises establishing the context policy enforcement engine in software (See page 23 lines 25-30).

4. As per claim 4: Lee teaches the method wherein receiving the request for context information comprises receiving the request for context information from a software application (See page 7 lines 23-25 and page 23 lines 25-30).

5. As per claim 5: Lee teaches the method wherein receiving the request for context information comprises receiving a request for at least one of: a location of the user, an activity of the user, an aspect of the environment in which the user is located, and biometric data related to the user (See page 11 lines 11-24 and col.15 lines 1-7).

6. As per claim 6: Lee teaches the method wherein receiving the request for context information comprises receiving a request for (i) the location of the user and (ii) at least one additional context parameter related to the user(See page 11 lines 11-24 and col.15 lines 1-7).

7. As per claim 7: Lee teaches the method wherein: receiving the request for context information comprises receiving the request from a requesting entity; and the context policy data defines a context policy rule based on the identification of the requesting entity(See page 5 lines 23-30).

8. As per claim 8: Lee teaches the method wherein the context policy data defines a rule based on a predetermined group of requesting entities (See page 5 lines 23-30).

9. As per claim 9: Lee teaches the method wherein the context policy data defines a rule based on a context parameter associated with the user (See page 5 lines 23-30).

10. As per claim 10: Lee teaches the method wherein the context policy data defines a rule based on the requested context information and a location of the user at the time of receiving the request for context information(See page 11 lines 11-24 and col.23 lines 25-35).

11. As per claim 11: Lee teaches the method wherein the context policy data defines a rule based on the requested context information and the time of day at which the request for context information is received(See page 11 lines 11-24 and col.23 lines 25-30).

12. As per claim 12: Lee teaches the method wherein the context policy data defines a rule based on the requested context information and an activity of the user (See page 5 lines 23-25).

13. As per claims 13 and 22: Lee teaches the method wherein responding to the request comprises determining context data based on the set of rules of the context policy data (See page 5 lines 23-30).

14. As per claims 14 and 23: Lee teaches the method wherein responding to the request further comprises retrieving the context data from a context database with the context policy enforcement engine based on the set of rules of the context policy data(See page 5 lines 23-30).

15. As per claim 15: Lee teaches the method wherein responding to the request further comprises transmitting the context data (See page 5 lines 23-30).

16. As per claims 16 and 24: Lee teaches the method wherein determining the context data comprises selecting context data from a plurality of datum defining a context parameter of the user, the plurality of datum having different levels of specificity defined in the set of rules of the context policy data(See page 5 lines 23-30).

17. As per claim 17: Lee teaches the method wherein: a context of the user is defined by a plurality of context parameters and the context policy data defines the set of rules based on a plurality of parameter characteristics associated with each context parameter, determining the context data comprises determining the context data for at least one of the parameter characteristics defined in the context policy data (See page 5 lines 23-30).

18. As per claim 18: Lee teaches the method further comprising: receiving user-supplied context policy rule with the mobile computing device, and updating the context policy data with the user-supplied context policy rule with the context policy enforcement engine(page 5 lines 23-30).

19. As per claim 19: Lee teaches the method further comprising: receiving user-supplied context data related to the user with the mobile computing device, and updating a context database stored on the mobile computing device with the user-supplied context data(See page 7 lines 23-25).

20. As per claim 20: Lee teaches the method further comprising: receiving context data related to the user from a source remote to the mobile communication device (See page 7 lines 23-25 and col.11 lines 1-9); and updating a context database stored on the mobile computing device with the user- supplied context data (See page 7 lines 23-25 and col.11 lines 1-9).

25. As per claim 25: A mobile computing device comprising: a context policy enforcement engine(See page 15-16(**i.e., 314 rule engine**); a processor(See page 11 lines 1-9(i.e., **the system can be implemented on a computing device which typically includes one or more processors**)); and a memory device having stored therein a plurality of instructions(See page 21 lines 12-13 and 314 rule engine register(i.e., **the context handling rules are registered via the rule register interface**)), which when executed by the processor, cause the context policy enforcement engine to: retrieve context policy data in response to receiving a request for context information related to a user of the computing device, the context policy data defining a set of rules for responding to context requests; determine context data related to a user of the mobile computing device based on the set of rules of the context policy data See page 15 lines 19-20(i.e., **the rule engine 314 executes the rules stored in the rule registry based on the collected fact data to generate the mid/higher-level context information)**; and respond to the request for context information with the determined context data(See page 15 lines 30-31(i.e., **the rule-engine 314 may even communicate the context information directly to the request application**)).

Conclusion

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO 892.

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fikremariam Yalew whose telephone number is 5712723852. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Moazzami Nasser, can be reached on 5712738300. The fax phone number for the organization where this application or proceeding is assigned is 571-272-4195.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/FIKREMARIAM A YALEW/

Examiner, Art Unit 2436

11/03/2011

Notice of References Cited	Application/Control No. 12/567,386	Applicant(s)/Patent Under Reexamination KOHLENBERG ET AL.	
	Examiner FIKREMARIAM A. YALEW	Art Unit 2436	Page 1 of 1

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*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,877,781	01-2011	Lim, Keng	726/1
*	B	US-2010/0146583	06-2010	Prehofer et al.	726/1
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
*	N	WO 2006/106303	10-2006	GB	Lee Habin	H04L 29/06
	O					
	P					
	Q					
	R					
	S					
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Petitioner Samsung Ex-1004, 0216

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Kohlenberg, Tobias M.
Art Unit	2432
Examiner Name	Barron, Gilberto Jr.
Attorney Docket Number	P31880

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	1	2302886	EP	A1	2011-03-30	Kohlenberg, et al.		☐

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Receipt date: 05/19/2011	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2009-09-25
	First Named Inventor	Kohlenberg, Tobias M.
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

	1	Office Action Received for European Patent Application No.10251637.4 mailed on March 22, 2011, 7 pages.	☐

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Filing Date	2009-09-25
First Named Inventor	Tobias M. Kohlenberg
Art Unit	2432
Examiner Name	Barron, Gilberto Jr.
Attorney Docket Number	P31880

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	1	20050060575	A1	2005-03-17	Trethewey, et al.	

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Receipt date: 07/21/2011	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Tobias M. Kohlenberg
Art Unit	2432
Examiner Name	Barron Jr., Gilberto
Attorney Docket Number	P31880/45631-209480

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	1	20050003804	A1	2005-01-06	Huomo et al.	
	2	20020174073	A1	2002-11-21	Nordman et al.	

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	1	2006/106303	WO	A1	2006-10-12	British Telecommunications Public Limited Company		☐
	2	1217857	EP	A2	2001-12-19	Microsoft Corporation		☐

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386 12567386 - GAU: 2436
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron Jr., Gilberto
	Attorney Docket Number	P31880/45631-209480

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	1	European Search Report for EP Application No. 10251637.4-2414, February 22, 2011, 3 pages.	☐

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CONFIRMATION NO. 4223

SERIAL NUMBER	FILING or 371(c) DATE / RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/567,386	09/25/2009	726	2436	P31880 / 45631-209480

APPLICANTS

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Selim Aissi, Beaverton, OR;
Dennis M. Morgan, Pine Grove, CA;
Alan D. Ross, Shingle Springs, CA;
Jim S. Baca, Corrales, NM;

**** CONTINUING DATA ***************************

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
10/07/2009

Foreign Priority claimed	☐ Yes ☑ No	☐ Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
35 USC 119(a-d) conditions met	☐ Yes ☑ No					
Verified and Acknowledged	/FIKREMARIAM A YALEW/ Examiner's Signature	FA Initials	OR	5	25	3

ADDRESS

Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402
UNITED STATES

TITLE

METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

FILING FEE RECEIVED	FEES: Authority has been given in Paper	
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Petitioner Samsung Ex-1004, 0223

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12567386	KOHLENBERG ET AL.
	Examiner	Art Unit
	FIKREMARIAM A YALEW	2436

SEARCHED			
Class	Subclass	Date	Examiner
726	1(including with text search)	11/4/2011	FA
726	2(inlcuding with text search)	11/4/2011	FA
713	$(including with text search)	11/4/2011	FA
380	$(including with text search)	11/4/2011	FA

SEARCH NOTES		
Search Notes	Date	Examiner
East search,NPL search(Google, IEEE,ACM Digiatal libarary),Inventor search	11/4/2011	FA

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12567386	KOHLENBERG ET AL.
	Examiner	Art Unit
	FIKREMARIAM A YALEW	2436

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	11/04/2011								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
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	25	✓								

Petitioner Samsung Ex-1004, 0225

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	5106	726/1-2.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:12
S3	221	context with policy near5 context with request	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:14
S4	164	S3 and (mobile or comput$ with device or cellphone or ipad)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:15
S5	71	S4 and set with rules	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:16
S6	2	S5 and (updat$3 or upgrad$3 or renew or refresh$3)with context with policy with data	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:17
S8	32	S5 and location with user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19
S9	15	S8 and "726"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19

Petitioner Samsung Ex-1004, 0226

S10	8	S8 and "713"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19
S11	7	S8 and "380"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19
S12	77	S1 and context with policy with data	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:21
S13	63	S12 and request	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:22
S14	32	S13 and location with user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:22
S15	6	("20050060575" or "20050003804" or "20020174073").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:25
S16	256	request with context with information same (context with (policy or rule))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:32
S17	37	S16 and S1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:32

Petitioner Samsung Ex-1004, 0227

S19	4	("20050003804" or "20020174073").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:33
S20	2997	726/22.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:34
S21	1	S20 and S3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:34
S22	0	Kohlengerg near tobias	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:35
S23	14	Kohlenberg near Tobias	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:35
S24	58	Aissi near Selim	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:35
S25	133	Morgan near Dennis	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S26	240	Ross near Alan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36

Petitioner Samsung Ex-1004, 0228

S27	16	Baca near Jim	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S28	4	S25 and S1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S30	2	S27 and S1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S31	221	context with policy near5 context with request	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S32	164	S31 and (mobile or comput$ with device or cellphone or ipad)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S33	71	S32 and set with rules	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S34	6	S33 and (updat$3 or upgrad$3 or renew or refresh$3)with context with policy	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S35	5106	726/1-2.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:55

Petitioner Samsung Ex-1004, 0229

S36	240	Ross near Alan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:55
S37	7	S36 and S35	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:55
S38	256	request with context with information same (context with (policy or rule))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:56
S39	37	S38 and S35	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:56
S40	17	S39 and location with user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:56

EAST Search History (Interference)

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Petitioner Samsung Ex-1004, 0230

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-09)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Zhao, Li
Art Unit	
Examiner Name	
Attorney Docket Number	P31880/45631-209480

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Receipt date: 10/12/2009	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT	Filing Date	2009-09-25
(Not for submission under 37 CFR 1.99)	First Named Inventor	Zhao, Li
	Art Unit	
	Examiner Name	
	Attorney Docket Number	P31880/45631-209480

	1	"Location Awareness", retrieved from Wikipedia last modified August 20, 2009 from http://en.wikipedia.org/wiki/Location_awareness; 5 pages.	☐
	2	Forrest, Brady, "iPhone's Location-Aware Apps", July 2008, retrieved from http://radar.oreilly.com/2008/07/iphone-location-aware-apps.html; 2 pages.	☐
	3	Zeman, Eric, "Google's 'Mail Goggles' Set To Be Your E-Mail Wingman -Google Blog", October 7, 2008, retrieved from http://www.iinformationweek.com/blog/main/archives/2008/10/googles_mail_go.html	☐

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EXAMINER SIGNATURE

Examiner Signature	/Fikremariam Yalew/	Date Considered	11/04/2011

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2436
	Examiner Name	Yalew, Fikremariam A.
	Attorney Docket Number	P31880/45631-209480

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	1	20020035605	A1	2002-03-21	McDowell et al.	
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Petitioner Samsung Ex-1004, 0233

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2436
	Examiner Name	Yalew, Fikremariam A.
	Attorney Docket Number	P31880/45631-209480

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2436
	Examiner Name	Yalew, Fikremariam A.
	Attorney Docket Number	P31880/45631-209480

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/GLEN M. KELLETT/	Date (YYYY-MM-DD)	2012-02-09
Name/Print	GLEN M. KELLETT	Registration Number	60202

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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Petitioner Samsung Ex-1004, 0236

Electronic Patent Application Fee Transmittal	
Application Number:	12567386
Filing Date:	25-Sep-2009
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Filer:	Glen Madison Kellett/Jenny Mundt
Attorney Docket Number:	P31880 / 45631-209480
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt	
EFS ID:	12034770
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett/Jenny Mundt
Filer Authorized By:	Glen Madison Kellett
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	09-FEB-2012
Filing Date:	25-SEP-2009
Time Stamp:	11:25:01
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	9602
Deposit Account	504238
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	P31880_Updated_IDS.pdf	612172 882015bab5eac9b8aabf5860cfb94c14d216b114	no	4
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30625 cb5d0395242ce15e69b9edaa1d470f9ba3fa8485	no	2
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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BARNES & THORNBURG LLP
11 South Meridian Street
Indianapolis, Indiana 46204

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	12/567,386
Confirmation No.:	4223
Art Unit:	2436
Examiner:	Yalew, Fikremariam A.
Application Title:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION FO A USER
First Named Applicant:	Tobias M. Kohlenberg
Filed:	09/25/2009
Attorney Docket:	P31880/45631-209480

ELECTRONICALLY SUBMITTED ON:

FEBRUARY 10, 2012

RESPONSE TO OFFICE ACTION

MAIL STOP AMENDMENT
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Office Action dated November 10, 2011, please consider the following:

Amendments to the Claims, which begin on page **2**; and

Remarks, which begin on page **9**.

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method comprising:

establishing a context policy enforcement engine on a mobile computing device;

receiving, from a requesting entity, a request for context information related to a user of the mobile computing device,

retrieving context policy data with the context policy enforcement engine, the context policy data defining a set of rules for responding to context requests; ~~and~~

determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of the requesting entity;

retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information; and

responding to the request for context information ~~based on the context policy data~~ with the retrieved context data.

2. (Original) The method of claim 1, wherein establishing a context policy enforcement engine comprises establishing the context policy enforcement engine in a secured boot environment.

3. (Original) The method of claim 1, wherein the establishing the context policy enforcement engine comprises establishing the context policy enforcement engine in software.

Petitioner Samsung Ex-1004, 0242

4. (Original) The method of claim 1, wherein receiving the request for context information comprises receiving the request for context information from a software application.

5. (Original) The method of claim 1, wherein receiving the request for context information comprises receiving a request for at least one of: a location of the user, an activity of the user, an aspect of the environment in which the user is located, and biometric data related to the user.

6. (Original) The method of claim 1, wherein receiving the request for context information comprises receiving a request for (i) the location of the user and (ii) at least one additional context parameter related to the user.

7. (Currently Amended) The method of claim 1, wherein:

~~receiving the request for context information comprises receiving the request from a requesting entity; and~~

the context policy data defines a context policy rule based on the identification of the requesting entity.

8. (Original) The method of claim 7, wherein the context policy data defines a rule based on a predetermined group of requesting entities.

Petitioner Samsung Ex-1004, 0243

9. (Original) The method of claim 1, wherein the context policy data defines a rule based on a context parameter associated with the user.

10. (Original) The method of claim 1, wherein the context policy data defines a rule based on the requested context information and a location of the user at the time of receiving the request for context information.

11. (Original) The method of claim 1, wherein the context policy data defines a rule based on the requested context information and the time of day at which the request for context information is received.

12. (Original) The method of claim 1, wherein the context policy data defines a rule based on the requested context information and an activity of the user.

13. (Original) The method of claim 1, wherein responding to the request comprises determining context data based on the set of rules of the context policy data.

14. (Original) The method of claim 13, wherein responding to the request further comprises retrieving the context data from a context database with the context policy enforcement engine based on the set of rules of the context policy data.

15. (Original) The method of claim 14, wherein responding to the request further comprises transmitting the context data.

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16. (Original) The method of claim 13, wherein determining the context data comprises selecting context data from a plurality of datum defining a context parameter of the user, the plurality of datum having different levels of specificity defined in the set of rules of the context policy data.

17. (Original) The method of claim 13, wherein:

a context of the user is defined by a plurality of context parameters and the context policy data defines the set of rules based on a plurality of parameter characteristics associated with each context parameter,

determining the context data comprises determining the context data for at least one of the parameter characteristics defined in the context policy data.

18. (Original) The method of claim 1, further comprising:

receiving user-supplied context policy rule with the mobile computing device, and

updating the context policy data with the user-supplied context policy rule with the context policy enforcement engine.

19. (Original) The method of claim 1, further comprising:

receiving user-supplied context data related to the user with the mobile computing device, and

updating a context database stored on the mobile computing device with the user-supplied context data.

Petitioner Samsung Ex-1004, 0245

20. (Original) The method of claim 1, further comprising:

receiving context data related to the user from a source remote to the mobile communication device; and

updating a context database stored on the mobile computing device with the user-supplied context data.

21. (Currently Amended) A non-transitory, machine readable medium comprising a plurality of instructions, that in response to being executed, result in a computing device:

establishing a context policy enforcement engine on a mobile computing device;

retrieving context policy data with the context policy enforcement engine in response to receiving a request for context information related to a user of the computing device, the context policy data defining a set of rules for responding to context requests; ~~and~~

determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of a requesting entity that requested the context information;

retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information; and

responding to the request for context information ~~based on the context policy data~~ with the retrieved context data.

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22. (Currently Amended) The non-transitory, machine readable medium of claim 21, wherein responding to the request comprises determining context data based on the set of rules of the context policy data.

23. (Currently Amended) The non-transitory, machine readable medium of claim 22, wherein responding to the request further comprises retrieving the context data from a context database with the context policy enforcement engine based on the set of rules of the context policy data.

24. (Currently Amended) The non-transitory, machine readable medium of claim 22, wherein determining the context data comprises selecting context data from a plurality of datum defining a context parameter of the user, the plurality of datum having different levels of specificity defined in the set of rules of the context policy data.

25. (Currently Amended) A mobile computing device comprising:

a context policy enforcement engine;

a processor; and

a memory device having stored therein a plurality of instructions, which when executed by the processor, cause the context policy enforcement engine to:

retrieve context policy data in response to receiving a request for context information related to a user of the computing device, the context policy data defining a set of rules for responding to context requests;

Petitioner Samsung Ex-1004, 0247

determine a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of a requesting entity that requested the context information;

retrieve context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information; and

~~determine context data related to a user of the mobile computing device based on the set of rules of the context policy data; and~~

respond to the request for context information with the determined retrieved context data.

Petitioner Samsung Ex-1004, 0248

REMARKS

Applicants thank the Examiner for consideration of the present application. Applicants have carefully reviewed the Office Action dated November 10, 2011 (hereinafter "the Office Action"). Claims 1-25 are believed to be pending in this application. Each of pending claims 1-25 stands rejected in the Office Action. In the present response, Applicants have amended each of 1, 7, and 21-25. Applicants respectfully request reconsideration of the present application in light of these amendments and the remarks presented below.

I. CLAIM REJECTIONS UNDER 35 U.S.C. § 101

The Office Action rejected claims 21-24 as being directed to non-statutory subject matter. Each of those claims is directed to a "machine readable medium." With regard to each of claims 27 and 32, the Office Action found that "[t]he term 'medium' however under [the] broadest interpretation includes a transitory signal for which the Office considers to be non-statutory subject matter." Applicants have amended each of claims 21-24 to recite a "non-transitory, machine readable medium" as suggested by the Examiner. In so doing, Applicants respectfully submit that the term "non-transitory" excludes only the subject matter of a transitory signal *per se* in accordance with *In re Nuijten*, 500 F. 3d 1346 (Fed. Cir. 2007), and specifically includes machine readable devices wherein data is stored in a temporary manner, such as volatile memory devices or RAM, as discussed in Para. [0012] of the present application. Applicants believe such amendments overcome the current Section 101 rejections of claims 21-24.

II. CLAIM REJECTIONS UNDER 35 U.S.C. § 102

Each of claims 1-25 stands rejected under 35 U.S.C. § 102(b) as being anticipated by International Application Publication No. WO/2006/106303 to Lee et al. (hereinafter "Lee"). The standard for anticipation under 35 U.S.C. § 102 is well established. MPEP § 2131 provides that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v.*

Petitioner Samsung Ex-1004, 0249

Union Oil Co. of Cal., 814 F.2d 628, 631 (Fed. Cir. 1987). The Federal Circuit has further emphasized that "unless a reference discloses within the four corners of the document not only ***all*** of the limitations claimed but also ***all of the limitations arranged or combined in the same way as recited in the claim***, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102." *Net MoneyIN v. Verisign*, 545 F.3d 1359, 88 USPQ2d 1751, 1759 (Fed. Cir. 2008) (emphasis added). As discussed below, Applicant respectfully submits that Lee fails to meet the standard for anticipation.

A. Independent Claim 1

The Office Action rejected independent claim 1 as being anticipated by Lee. In so doing, the Office Action asserts that Lee discloses each and every feature of independent claim 1. While Applicants respectfully disagree, Applicants have amended independent claim 1 to further clarify the nature in which the context data is determined for the requesting entity. Specifically, independent claim 1 has been amended to recite "determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of the requesting entity" and "retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information." As described in Para. [0022], [0025]-[0028] and illustratively shown in FIG. 3 of the present application:

> [T]he context of the user may be defined by a plurality of context parameters that each defines a particular aspect of the context of the user at a particular point in time. Such context parameters may include, for example, the location of the user, the current activity of the user, environmental data of the environment in which the user is located, biometric data of the user, and the like. Additionally, each context parameter may have one or more characteristics associated therewith that define the level of specificity of the context parameter. Such characteristics may include, for example, the granularity of the context parameter data (e.g., what city is the user located in , what building is the user located in, what are the GPS coordinates of the user, etc.), the confidence of the context parameter (e.g., what is the likelihood that the context parameter data is accurate, what data collection methods were used, etc.), and the currency of the context parameter data (e.g., when was the data collected, how old is the data, when is the next context update, etc.).

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Applicants Specification, Para. [0022]. As such, the context of the user is defined by various context parameters (e.g., location, activity, environment, etc.) that each have corresponding context characteristics (e.g., granularity, confidence, currency, etc.). Each of the context characteristics has a plurality of levels of specificity for the associated context data. For example, as shown in FIG. 3 of Applicants' specification, the illustrative "location" context parameter is defined as having a "granularity" context characteristic having three levels of specificity. Each level of specificity has context data of corresponding varying levels of specificity associated therewith. Access to the various levels of specificity is controlled by a set of rules defined by the context policy data. Accordingly, as recited in amended independent claim 1, the level of specificity of a context characteristic of a context parameter associated with the requested context information is determined based on identity of the requesting entity and the context policy data (which defines which level of specificity of context data to allow access to).

Turning now to Lee, Applicants respectfully submit that Lee fails to disclose, at least, the amended features of independent claim 1. First, while Lee does appear to disclose a set of rules, those rules are not used for determining which data to retrieve and send in response to a request. Rather, the rules disclosed in Lee are used to generate context information based on received context data. For example, Lee teaches:

> In a further aspect of the invention, a system for processing context data is provided which includes means for receiving context data from a plurality of sources; means for **producing context information from the received context data according to a predetermined rule-set including a plurality of rules** . . .

Lee, Page 4, ll. 4-7, emphasis added. Conversely, as recited in amended claim 1, the set of rules of the context policy data are used to determine which level of specificity of the context data should be returned in response to the request based on the identity of the requesting entity.

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Additionally, while Lee discloses that particular context information may have different "levels," such levels of context information are not equivalent to levels of specificity as recited in amended claim 1. Rather, the levels of context information of Lee are simply induced information based on a plurality of low level context data. As such, the context data, itself, does not include multiple levels of specificity. For example, Lee discloses:

> For example, the context data can be based on identity (user number 2), time (30 minutes) and location data (latitude/longitude co-ordinates), and mid-level context information can be, for example, "user 2 has been at the latitude/longitude co-ordinates for 20 minutes," and higher-level context information can be, for example, "user 2 is late" or "user 2 is in danger."

Lee, Page 15, lines 1-5. That is, the "mid-level" context information disclosed in Lee is induced from a plurality of "low level" context information, and the "high-level" information is a further induction of the "mid-level" context information. However, neither the "mid-level" nor the "high-level" context information can be fairly referred to as a different level fo specificity of the underlying context data (i.e., the "low level" context information). For example, in the example discussed in Lee, the fact that "user 2 has been at the latitude/longitude co-ordinates for 20 minutes" is neither a lower or higher level of specificity of the location data or of the user identity. Accordingly, Lee fails to discloses varying levels of specificity of a context characteristic of a context parameter of requested context information as recited in amended independent claim 1.

Further, Lee fails to "determining a level of specificity . . . as a function of the context policy data and an identity of the requesting entity" as recited in amended claim 1. Rather, Lee clearly teaches that the particular context information (i.e., "low level," "mid-level," or "high-level") that is sent in response to the request for context information is simply dictated by the request itself, not by the identity of the requesting entity and a set of rules to determine

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which context information to retrieve. For example, Lee teaches that "[a]n application may make a request for any level of context information i.e. either low/mid or higher-level context information." Lee, Page 15, line 6. As such, the requester, not the device of Lee, determines which context information is selected. Conversely, amended independent claim 1 recites retrieving context data based on the context policy data and the identity of the requesting entity (i.e., the allowed level of specificity of te context data is based on the identity of the requesting entity).

For at least the reasons discussed above, Applicants respectfully submit that Lee fails to disclose each and every feature of amended independent claim 1. As such, Lee fails to anticipate that claim. Accordingly, Applicants respectfully request the withdrawal of the current Section 102 rejection of claim 1.

B. Independent Claim 21

The Office Action rejected independent claim 21 under the same analysis as set forth in the rejection of independent claim 1. Independent claim 21 has been amended in a manner similar to independent claim 1. As such, all of the arguments presented above with regard to independent claim 1 apply with equal force to the rejection of independent claim 21 and are incorporated into this section by reference. Accordingly, for at least those reasons, Lee fails to disclose each and every feature of independent claim 21. As such, Lee fails to anticipate independent claim 21, and Applicants respectfully submit that claim 21 is in condition for allowance.

C. Independent Claim 25

The Office Action rejected independent claim 25 under a similar analysis as set forth in the rejection of independent claim 1. Independent claim 25 has been amended in a manner

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similar to independent claim 1. As such, all of the arguments presented above with regard to independent claim 1 apply with equal force to the rejection of independent claim 25 and are incorporated into this section by reference. Accordingly, for at least those reasons, Lee fails to disclose each and every feature of independent claim 25. As such, Lee fails to anticipate independent claim 25, and Applicants respectfully submit that claim 25 is in condition for allowance.

III. DEPENDENT CLAIMS 2-20 and 22-24

Each of claims 2-20 includes independent claim 1 as a base claim, and each of claims 22-24 includes independent claim 21 as a base claim. As such, all of the arguments presented above with regard to the independent claims 1 and 21 apply with equal force to the corresponding dependent claims. For at least those reasons, each of claims 2-20 and 22-24 is believed to be in condition for allowance and such action is respectfully requested.

IV. CONCLUSION

In view of the foregoing, it is submitted that this application is in a condition for allowance. Action to that end is hereby solicited. If there are any questions or comments that would expedite prosecution of this application, the Examiner is invited to call the undersigned at (317) 261-7959.

It is respectfully requested that, if necessary to effect a timely response, this paper be considered as a Petition for an Extension of Time sufficient to effect a timely response. The Commissioner is hereby authorized to charge the fee for any such Petition, if needed, and any

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shortage of fees, and credit any overpayment of fees, to the Account of Barnes & Thornburg, Deposit Account No. 10-0435 with reference to file 45631-209480.

Respectfully submitted,



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Petitioner Samsung Ex-1004, 0255

Electronic Acknowledgement Receipt

EFS ID:	12055317
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett
Filer Authorized By:	
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	10-FEB-2012
Filing Date:	25-SEP-2009
Time Stamp:	23:49:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	P31880_Response.pdf	166647 35f648f3df1dc4403fb47214b289c9207d990b36	no	15
Warnings:					
Information:					

Total Files Size (in bytes):	166647

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/567,386	09/25/2009	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 02/10/2012	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 25	Minus	** 25	= 0	X $ =		OR	X $60=	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $ =		OR	X $250=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)	OR	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/MARY HOLMES/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480	4223

73486 7590 06/13/2012

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EXAMINER	
YALEW, FIKREMARIAM A	
ART UNIT	**PAPER NUMBER**
2436	
MAIL DATE	**DELIVERY MODE**
06/13/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Petitioner Samsung Ex-1004, 0259

Office Action Summary	Application No.	Applicant(s)	
	12/567,386	KOHLENBERG ET AL.	
	Examiner	Art Unit	
	FIKREMARIAM A. YALEW	2436	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 January 2012*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-25* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-25* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/09/2012*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The office action is in replay to an amendment filed on 02/10/2012.Claims 1, 7 and 21-25 have been amended. Claims 1-25 are pending.

2. The examiner withdraws the 35 USC 101 rejection based on the applicant claim amendment.

Response to Arguments

3. Applicant's arguments with respect to claim 1-25 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1,3-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parupudi et al(hereinafter referred as Parupudi) US Patent No 7,072,956 B2 and further in view of Henry et al (hereinafter referred as Henry) US Pub No 2008/0194233.

6. As per claims 1, 21: Parupudi teaches a method/computing device comprising: establishing a context policy enforcement engine on a mobile computing device (See Fig 6 step 602 and Fig 12 lines 1202,1204 and col.25 line 51 through col.26 line 21 (i.e., **context service with policy engine on computing device**)); receiving, from requesting entity, a request for context information related to a user of the mobile computing device(See col.6 lines 19-42(i.e.,

entities request location(context) information of mobile device……)), retrieving context policy data with the context policy enforcement engine, the context policy data defining a set of rules for responding to context requests(See Fig 15 step 1502,1504 and col.25 line 51 through col.26 line 21(i.e., **determine context of a computing device and based on the determined context , evaluates policy collection to provide a resultant set of policies**)); respond to the request for context information with the determined context data(See Fig 8 step 816,Fig 10 step 1012 and col.16 lines 9-25, col.24 lines 4-47 (i.e**., determine context based upon context information & return context information associated with a node that has a corresponding privacy leve**l)).

Parupudi does not explicitly teach determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of the requesting entity; retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information.

However Henry teaches determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of the requesting entity(See 0027-0029(i.e., **upon request of request context analysis module determine the context of request**...**the context information that can be obtained context analysis module can be include not limited location or information of user, credit card information of user, device type being using**)); retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information(See 0043 and claim 12(i.e., **policy**

module retrieves subscription profile in a step one or more contexts for service request are determined).

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to employ the teaching method of Henry et al within Parupudi et al method in order to determine plurality of context for service request via context aware service subscription management(See Henry 0006). .

7. As per claim 3: the combination of Parupudi and Henry teach the method wherein the establishing the context policy enforcement engine comprises establishing the context policy enforcement engine in software (See Parupudi Fig 6 step 602,608 and col.2 lines 19-39, col.6 lines 21-40(i.e., **context aware module provide for application and enforcement of various policies as a function of context**)).

8. As per claim 4: the combination of Parupudi and Henry teach wherein receiving the request for context information comprises receiving the request for context information from a software application (See Parupudi Fig 6 step 602,608 and col.2 lines 19-39, col.6 lines 21-40(i.e., **context aware module provide for application and enforcement of various policies as a function of context**).

9. As per claim 5: the combination of Parupudi and Henry teach the method wherein receiving the request for context information comprises receiving a request for at least one of: a location of the user, an activity of the user, an aspect of the environment in which the user is located, and biometric data related to the user (See Henry 0027, 0039(i.e., **context information contain by context analysis module include but are not limited to location or presence information of the user**)).

10. As per claim 6: the combination of Parupudi and Henry teach the method wherein receiving the request for context information comprises receiving a request for (i) the location of the user and (ii) at least one additional context parameter related to the user (See Henry 0027, 0039(i.e., **context information contain by context analysis module include but are not limited to location or presence information of the user, recent user activity on the network, device type being used…etc**)).

11. As per claim 7: the combination of Parupudi and Henry teach the method wherein: receiving the request for context information comprises receiving the request from a requesting entity(See Parupudi col.6 lines 19-42(i.e., **entities request location(context) information of mobile device……**)); and the context policy data defines a context policy rule based on the identification of the requesting entity(See Henry 0025-0030 & Fig 12 steps 1204,1214,1216(i.e., **policy engine with user identity & attributes.....device identity & attributes**)).

12. As per claim 8: the combination of Parupudi and Henry teach the method wherein the context policy data defines a rule based on a predetermined group of requesting entities (See Parupudi col.6 lines 19-43 and abstract (i.e., **assign a privacy levels to entities that might request location information….& provided context aware that provide for enforcement of various policies as a function of context**).

13. As per claim 9: the combination of Parupudi and Henry teach the method wherein the context policy data defines a rule based on a context parameter associated with the user (See Henry 0027, 0039(i.e., **context information contain by context analysis module include but are not limited to location or presence information of the user, recent user activity on the network, device type being used…etc**).

14. As per claim 10: the combination of Parupudi and Henry teach the method wherein the context policy data defines a rule based on the requested context information and a location of the user at the time of receiving the request for context information (See Henry 0025-0030 and 0039(i.e**., context information contain by context analysis module include but are not limited to location or presence information of the user, recent user activity on the network, device type being used…etc & context can be function of time of day, day of the week or other parameter**)).

15. As per claim 11: the combination of Parupudi and Henry teach the method wherein the context policy data defines a rule based on the requested context information and the time of day at which the request for context information is received (See Henry 0025-0029 and 0039(i.e., **context information contain by context analysis module include but are not limited to location or presence information of the user, recent user activity on the network, device type being used…etc & context can be function of time of day, day of the week or other parameter**)).

16. As per claim 12: the combination of Parupudi and Henry teach the method wherein the context policy data defines a rule based on the requested context information and an activity of the user (See Henry 0025-0029 and 0039(i.e., **context information contain by context analysis module include but are not limited to location or presence information of the user, recent user activity on the network, device type being used…etc**)).

17. As per claims 13 and 22: the combination of Parupudi and Henry teach the method the method wherein the request comprises determining context data based on the set of rules of the

context policy data (See Parupudi Fig 15 step 1502, 1504 and col.2 lines 21-40, col.5 lines 20-40(i.e., **determine context of a computing device and based on the determined context , evaluates policy collection to provide a resultant set of policies) &** See Henry 0027-0029(i.e., **upon request of request context analysis module determine the context of request...the context information that can be obtained context analysis module can be include not limited location or information of user, credit card information of user, device type being using**).

18. As per claims 14 and 23: the combination of Parupudi and Henry teach the method wherein responding to the request further comprises retrieving the context data from a context database with the context policy enforcement engine based on the set of rules of the context policy data (See Henry 0004 0043 and claim 12(i.e., **policy module retrieves subscription profile in a step one or more contexts for service request are determined……requiring that subscription profile and service preference database be predefined**)& See Parupudi Fig 8 step 816,Fig 10 step 1012(i.e**., determine context based upon context information & return context information associated with a node that has a corresponding privacy leve**l).

19. As per claim 15: the combination of Parupudi and Henry teach the method wherein responding to the request further comprises transmitting the context data (See Parupudi col.5 lines 20-44(i.e., **determine the device current context information and provide the current context at some level to one or more applications that can use the device's context**)).

20. As per claims 16 and 24: the combination of Parupudi and Henry teach the method wherein determining the context data comprises selecting context data from a plurality of datum

defining a context parameter of the user, the plurality of datum having different levels of specificity defined in the set of rules of the context policy data (See Henry 0006-0007,0027 and Fig 13(i.e., **the policy rules module provides policy rules which set forth rules to determine conditions upon which a service will be delivered.....the policy decision module uses the contextual information to in effect temporarily override a subscription profile based on the context of a service request by the user**)).

21. As per claim 17: the combination of Parupudi and Henry teach the method wherein: a context of the user is defined by a plurality of context parameters and the context policy data defines the set of rules based on a plurality of parameter characteristics associated with each context parameter, determining the context data comprises determining the context data for at least one of the parameter characteristics defined in the context policy data (See Henry 0027-0029(i.e., **upon request of request context analysis module determine the context of request**...**the context information that can be obtained context analysis module can be include not limited location or information of user, credit card information of user, device type being using**).

22. As per claim 18: the combination of Parupudi and Henry teach the method further comprising: receiving user-supplied context policy rule with the mobile computing device, and updating the context policy data with the user-supplied context policy rule with the context policy enforcement engine (See Parupudi col.19 lines 14-41 (i.e., **user define specific times when the location (context) information should be updated….the location information might be updated only when a device's location changes**)).

23. As per claim 19: the combination of Parupudi and Henry teach the method further

comprising: receiving user-supplied context data related to the user with the mobile computing device, and updating a context database stored on the mobile computing device with the user-supplied context data (See Parupudi col.19 lines 14-41 and Fig 7 step 606 (i.e., **user define specific times when the location (context) information should be updated….the location information might be updated only when a device's location changes & a cache can be updated with the current location including time stamp**).

24. As per claim 20: the combination of Parupudi and Henry teach the method further comprising: receiving context data related to the user from a source remote to the mobile communication device (See Parupudi Fig 7 step 606 and See col.19 lines 14-41 (i.e., **user define specific times when the location (context) information should be updated….the location information might be updated only when a device's location changes & a cache can be updated with the current location including time stamp**); and updating a context database stored on the mobile computing device with the user- supplied context data (See Parupudi col.19 lines 14-41 and Fig 7 step 606 (i.e., **user define specific times when the location (context) information should be updated….the location information might be updated only when a device's location changes & a cache can be updated with the current location including time stamp**).

25. As per claim 25: Parupudi teaches a mobile computing device comprising: a context policy enforcement engine(See Fig 12 steps 1202,1204(i.e**., policy engine**)); a processor(See col.7 lines 13-67(i.e. Processor))); and a memory device having stored therein a plurality of instructions, which when executed by the processor(See col.7 lines 13-67(i.e., **computer readable media and software executing on the one or more processors**), cause the context

policy enforcement engine to: retrieve context policy data in response to receiving a request for context information related to a user of the computing device, the context policy data defining a set of rules for responding to context requests; determine context data related to a user of the mobile computing device based on the set of rules of the context policy data (See Fig 15 step 1502,1504 and col.25 line 51 through col.26 line 21(i.e., **determine context of a computing device and based on the determined context , evaluates policy collection to provide a resultant set of policies**); and respond to the request for context information with the determined context data(See Fig 8 step 816,Fig 10 step 1012 and col.16 lines 9-25, col.24 lines 4-47 (i.e**., determine context based upon context information & return context information associated with a node that has a corresponding privacy leve**l)).

Parupudi does not explicitly teach determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of the requesting entity; retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information and responding to the request for context information with the retrieved context data.

However Henry teaches determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of the requesting entity(See 0027-0029(i.e., **upon request of request context analysis module determine the context of request...the context information that can be obtained context analysis module can be include not limited location or information of user, credit card information of user, device type being using…..etc & temporarily**

overrides user profile based on the context of service access by user)); retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information and responding to the request for context information with the retrieved context data(See 0043 and claim 12(i.e., **policy module retrieves subscription profile in a step one or more contexts for service request are determined**).

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to employ the teaching method of Henry et al within Lee et al method in order to determine the context of the service request via context aware service subscription management(See Henry 0006).

26. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parupudi et al(hereinafter referred as Parupudi) US Patent No 7,072,956 B2 and further in view of Henry et al (hereinafter referred as Henry) US Pub No 2008/0194233 and further in view of Smith et al(hereinafter referred as Smith) US Pub No 2009/0319806 A1.

27. As per claim 2: the combination of Parupudi and Henry teach claim 1 as recited above. The combination of Parupudi and Henry teach the method wherein establishing a context policy enforcement engine comprises establishing the context policy enforcement engine in a secured boot environment.

However Smith teaches the method wherein establishing a context policy enforcement engine comprises establishing the context policy enforcement engine in a secured boot environment (See 0006, 0026-0029(i.e., context with secured boot environment)).

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to employ the teaching method of Smith et al within the combination of Parupudi and Henry et al method in order to enable a platform to provide an extensible pre-boot authentication that can interact with security enhancements (See Smith 0027).

Conclusion

28. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

29. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays should be clearly labeled "Comments on statement of Reasons for allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fikremariam Yalew whose telephone number is 5712723852.

The examiner can normally be reached on 9-5. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Chea, can be reached on 5712723951. The fax phone number for the organization where this application or proceeding is assigned is 571-272-4195.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/FIKREMARIAM A YALEW/

Examiner, Art Unit 2436

05/31/2012

Notice of References Cited	Application/Control No. 12/567,386	Applicant(s)/Patent Under Reexamination KOHLENBERG ET AL.	
	Examiner FIKREMARIAM A. YALEW	Art Unit 2436	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-7,072,956	07-2006	Parupudi et al.	709/223
*	B	US-2008/0194233	08-2008	Henry, Pascal	455/411
*	C	US-2009/0319806	12-2009	Smith et al.	713/193
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	5106	726/1-2.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:12
S3	221	context with policy near5 context with request	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:14
S4	164	S3 and (mobile or comput$ with device or cellphone or ipad)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:15
S5	71	S4 and set with rules	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:16
S6	2	S5 and (updat$3 or upgrad$3 or renew or refresh$3)with context with policy with data	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:17
S8	32	S5 and location with user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19
S9	15	S8 and "726"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19
S10	8	S8 and "713"/$.ccls.	US-PGPUB;	OR	OFF	2011/11/04

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			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			17:19
S11	7	S8 and "380"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19
S12	77	S1 and context with policy with data	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:21
S13	63	S12 and request	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:22
S14	32	S13 and location with user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:22
S15	6	("20050060575" or "20050003804" or "20020174073").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:25
S16	256	request with context with information same (context with (policy or rule))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:32
S17	37	S16 and S1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:32
S19	4	("20050003804" or "20020174073").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2011/11/04 17:33

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			IBM_TDB			
S20	2997	726/22.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:34
S21	1	S20 and S3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:34
S22	0	Kohlengerg near tobias	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:35
S23	14	Kohlenberg near Tobias	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:35
S24	58	Aissi near Selim	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:35
S25	133	Morgan near Dennis	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S26	240	Ross near Alan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S27	16	Baca near Jim	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S28	4	S25 and S1	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2011/11/04 17:36

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			EPO; JPO; DERWENT; IBM_TDB			
S30	2	S27 and S1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S31	221	context with policy near5 context with request	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S32	164	S31 and (mobile or comput$ with device or cellphone or ipad)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S33	71	S32 and set with rules	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S34	6	S33 and (updat$3 or upgrad$3 or renew or refresh$3)with context with policy	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S35	5106	726/1-2.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:55
S36	240	Ross near Alan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:55
S37	7	S36 and S35	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:55
S38	256	request with context with information same (context with (policy or rule))	US-PGPUB; USPAT;	OR	OFF	2011/11/04 17:56

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			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S39	37	S38 and S35	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:56
S40	17	S39 and location with user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:56
S41	4	"20020035605"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:39
S42	0	reteriev$3 near5 (context adj data) same ((device with id) or (entity adj id))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:46
S43	0	reteriev$3 near5 (context adj data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:46
S44	435	retriev$3 near5 (context adj data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:46
S45	0	retriev$3 near5 (context adj data)same ((context with policy) and (device with id) or (entity with id))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:48
S46	17	retriev$3 near5 (context adj data)and ((context with policy) and (device with id) or (entity with id))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:48

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S47	25	S44 and "713"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:49
S48	3	S44 and "380"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:49
S49	32	S44 and "726"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:49
S50	14	S44 and "455"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:49
S57	12	("20090083768" or "20110113471" or "20080016580" or "20090271383" or "20090228953" or "20090271383" or "20080194233")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 18:54
S59	26	context adj parameter near5 context with information	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 19:03
S60	2	S59 and "726"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 19:04
S62	3	S59 and "709"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 19:04
S64	4	"20020035605"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2012/05/23 19:52

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S69	2	"20080194233"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/24 16:53
S70	0	"20090319806"	USPAT	OR	OFF	2012/05/29 17:10
S71	2	"20090319806"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/29 17:10
S72	2	"6750883".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/29 17:11
S73	85	("4845744" | "5224150" | "5230048" | "5230072" | "5295261" | "5479476" | "5499032" | "5539922" | "5644740" | "5752243" | "5774540" | "5794142" | "5806017" | "5917911" | "5937164" | "5945985" | "5948040" | "5953722" | "5991756" | "6018570" | "6028551" | "6057845" | "6078826" | "6088717" | "6091956" | "6128759" | "6151601" | "6185569" | "6216087" | "6233448" | "6279007" | "6281896" | "6292833" | "6300936" | "6307573" | "6313791" | "6327535" | "6343291" | "6359892" | "6389288" | "6401051" | "6411899" | "6421072" | "6421544" | "6421716"	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/29 17:16

Petitioner Samsung Ex-1004, 0280

		"6442620" | "6470344" | "6522875" | "6581062" | "6625615").PN. OR ("6750883").URPN.				
S74	103	("20020029291" | "20020081984" | "20020083025" | "20020111715" | "20020119788" | "20020120370" | "20020122055" | "20020156870" | "20050091223" | "4845744" | "5224100" | "5224150" | "5230048" | "5230072" | "5285261" | "5295261" | "5319775" | "5321815" | "5442805" | "5479476" | "5499032" | "5539922" | "5611050" | "5635940" | "5644740" | "5717387" | "5752243" | "5774540" | "5794142" | "5806017" | "5870751" | "5917911" | "5937164" | "5945985" | "5948040" | "5953722" | "5991756" | "6011973" | "6018570" | "6028551" | "6031545" | "6054989" | "6057845" | "6078826" | "6088717" | "6091956" | "6104344" | "6104980" | "6125446" | "6127947" | "6128759" | "6148261" | "6151601" | "6160553" | "6166738" | "6182136" | "6185569" | "6188405" | "6201973" | "6216087" | "6233448" | "6243093" | "6249252" | "6279007" | "6281896" | "6292833" | "6300936" | "6307573" | "6313791" | "6321092" | "6327535" | "6336138" | "6343291" | "6359892" | "6374177" | "6389288" | "6401051" | "6405020" | "6411220" | "6411899" | "6418533" | "6421072" | "6421544" | "6421716" | "6442620" | "6462706" | "6466918" | "6470344" | "6470354" | "6513059" | "6522875" | "6525768" | "6553310" | "6581062" | "6594666" | "6625615" | "6628928" | "6748225" | "6750883" | "6823354" | "6918537").PN. OR ("7072956").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/29 17:39

6/1/2012 12:14:01 PM
C:\Users\fyalew\Documents\EAST\Workspaces\12567386.wsp

Petitioner Samsung Ex-1004, 0281

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12567386	KOHLENBERG ET AL.
	Examiner	Art Unit
	FIKREMARIAM A YALEW	2436

SEARCHED			
Class	Subclass	Date	Examiner
726	1(including with text search)	6/1/2012	FA
726	2(inlcuding with text search)	6/1/2012	FA
713	$(including with text search)	6/1/2012	FA
380	$(including with text search)	6/1/2012	FA
455	$.ccls.(including with text search)	6/1/2012	FA
709	$.ccls.(including with text search)	6/1/2012	FA

SEARCH NOTES		
Search Notes	Date	Examiner
Updated East search,NPL search(Google, patent, google scholar),Inventor search	6/1/2012	FA

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Tobias M. Kohlenberg
Art Unit	2436
Examiner Name	Yalew, Fikremariam A.
Attorney Docket Number	P31880/45631-209480

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	1	20020035605	A1	2002-03-21	McDowell et al.	

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Receipt date: 02/09/2012	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2436
	Examiner Name	Yalew, Fikremariam A.
	Attorney Docket Number	P31880/45631-209480

	1		☐

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EXAMINER SIGNATURE

Examiner Signature	/Fikremariam Yalew/	Date Considered	06/01/2012

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

Receipt date: 02/09/2012	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2436
	Examiner Name	Yalew, Fikremariam A.
	Attorney Docket Number	P31880/45631-209480

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/GLEN M. KELLETT/	Date (YYYY-MM-DD)	2012-02-09
Name/Print	GLEN M. KELLETT	Registration Number	60202

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12567386	KOHLENBERG ET AL.
	Examiner	Art Unit
	FIKREMARIAM A YALEW	2436

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	06/01/2012								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
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	25	✓								

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.:	12/567,386
Confirmation No.:	4223
Art Unit:	2436
Examiner:	Yalew, Fikremariam A.
Application Title:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Applicant:	Tobias M. Kohlenberg
Filed:	September 25, 2009
Attorney Docket:	P31880/45631-209480

ELECTRONICALLY SUBMITTED ON:

JULY 23, 2012

RESPONSE TO FINAL OFFICE ACTION

Mail Stop AF
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the Final Office Action dated June 13, 2012, please consider the following:

Claim Listing, which begins on page **2** of this paper; and

Remarks, which begin on page **9** of this paper.

CLAIM LISTING

The Applicants submit the following claim listing in compliance with 37 C.F.R. § 1.121(c).

1. (Previously Presented) A method comprising:

establishing a context policy enforcement engine on a mobile computing device;

receiving, from a requesting entity, a request for context information related to a user of the mobile computing device,

retrieving context policy data with the context policy enforcement engine, the context policy data defining a set of rules for responding to context requests;

determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of the requesting entity;

retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information; and

responding to the request for context information with the retrieved context data.

2. (Original) The method of claim 1, wherein establishing a context policy enforcement engine comprises establishing the context policy enforcement engine in a secured boot environment.

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3. (Original) The method of claim 1, wherein the establishing the context policy enforcement engine comprises establishing the context policy enforcement engine in software.

4. (Original) The method of claim 1, wherein receiving the request for context information comprises receiving the request for context information from a software application.

5. (Original) The method of claim 1, wherein receiving the request for context information comprises receiving a request for at least one of: a location of the user, an activity of the user, an aspect of the environment in which the user is located, and biometric data related to the user.

6. (Original) The method of claim 1, wherein receiving the request for context information comprises receiving a request for (i) the location of the user and (ii) at least one additional context parameter related to the user.

7. (Previously Presented) The method of claim 1, wherein:

the context policy data defines a context policy rule based on the identification of the requesting entity.

8. (Original) The method of claim 7, wherein the context policy data defines a rule based on a predetermined group of requesting entities.

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9. (Original) The method of claim 1, wherein the context policy data defines a rule based on a context parameter associated with the user.

10. (Original) The method of claim 1, wherein the context policy data defines a rule based on the requested context information and a location of the user at the time of receiving the request for context information.

11. (Original) The method of claim 1, wherein the context policy data defines a rule based on the requested context information and the time of day at which the request for context information is received.

12. (Original) The method of claim 1, wherein the context policy data defines a rule based on the requested context information and an activity of the user.

13. (Original) The method of claim 1, wherein responding to the request comprises determining context data based on the set of rules of the context policy data.

14. (Original) The method of claim 13, wherein responding to the request further comprises retrieving the context data from a context database with the context policy enforcement engine based on the set of rules of the context policy data.

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15. (Original) The method of claim 14, wherein responding to the request further comprises transmitting the context data.

16. (Original) The method of claim 13, wherein determining the context data comprises selecting context data from a plurality of datum defining a context parameter of the user, the plurality of datum having different levels of specificity defined in the set of rules of the context policy data.

17. (Original) The method of claim 13, wherein:

a context of the user is defined by a plurality of context parameters and the context policy data defines the set of rules based on a plurality of parameter characteristics associated with each context parameter,

determining the context data comprises determining the context data for at least one of the parameter characteristics defined in the context policy data.

18. (Original) The method of claim 1, further comprising:

receiving user-supplied context policy rule with the mobile computing device, and

updating the context policy data with the user-supplied context policy rule with the context policy enforcement engine.

19. (Original) The method of claim 1, further comprising:

receiving user-supplied context data related to the user with the mobile computing device, and

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updating a context database stored on the mobile computing device with the user-supplied context data.

20. (Original) The method of claim 1, further comprising:

receiving context data related to the user from a source remote to the mobile communication device; and

updating a context database stored on the mobile computing device with the user-supplied context data.

21. (Previously Presented) A non-transitory, machine readable medium comprising a plurality of instructions, that in response to being executed, result in a computing device:

establishing a context policy enforcement engine on a mobile computing device;

retrieving context policy data with the context policy enforcement engine in response to receiving a request for context information related to a user of the computing device, the context policy data defining a set of rules for responding to context requests;

determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of a requesting entity that requested the context information;

retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information; and

responding to the request for context information with the retrieved context data.

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22. (Previously Presented) The non-transitory, machine readable medium of claim 21, wherein responding to the request comprises determining context data based on the set of rules of the context policy data.

23. (Previously Presented) The non-transitory, machine readable medium of claim 22, wherein responding to the request further comprises retrieving the context data from a context database with the context policy enforcement engine based on the set of rules of the context policy data.

24. (Previously Presented) The non-transitory, machine readable medium of claim 22, wherein determining the context data comprises selecting context data from a plurality of datum defining a context parameter of the user, the plurality of datum having different levels of specificity defined in the set of rules of the context policy data.

25. (Previously Presented) A mobile computing device comprising:

a context policy enforcement engine;

a processor; and

a memory device having stored therein a plurality of instructions, which when executed by the processor, cause the context policy enforcement engine to:

retrieve context policy data in response to receiving a request for context information related to a user of the computing device, the context policy data defining a set of rules for responding to context requests;

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determine a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of a requesting entity that requested the context information;

retrieve context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information; and

respond to the request for context information with the determined retrieved context data.

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REMARKS

The Applicants thank the Examiner for consideration of the present application. The present response is submitted in response to, and within two months of the mailing date of, the Final Office Action dated June 13, 2012 (hereinafter "the Office Action"). The Applicants have carefully reviewed the Office Action. Prior to this Response, claims 1-25 are believed to be pending in this application. Each of pending claims 1-25 stands rejected in the Office Action. The Applicants respectfully request reconsideration of the present application in light of the remarks presented below.

I. CLAIM LISTING

Although no claims have been amended in this response, the Applicants submit the attached claim listing for the convenience of the Examiner.

II. 35 U.S.C. § 103(a) REJECTIONS

Claims 1 and 3-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 7,072,956 to Parupudi et al. (hereinafter "Parupudi") in view of U.S. Patent Application Pub. No. 2008/0194233 to Henry (hereinafter "Henry"). Additionally, claim 2 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Parupudi in view of Henry and further in view of U.S. Patent Application Pub. No. 2009/0319806 to Smith et al. (hereinafter "Smith"). It is well settled that the analysis required under 35 U.S.C. § 103(a) must be resolved on the basis of the factual inquiries outlined in *Graham v. John Deere, Co.*, 383 U.S. 1, 148 USPQ 459 (1966); *see KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740 (2007). The *Graham* Court stated that as part of any analysis under Section 103,

> the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.

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148 USPQ at 467. The analysis of obviousness therefore requires an inquiry into the scope and content of the prior art and, more particularly, an inquiry into whether the prior art discloses all of the elements of the claimed invention. For at least the following reasons, the Applicants respectfully submit that the cited references fail to disclose all of the elements of the claimed invention and thus fail to render independent claims 1, 21, and 25 unpatentable under Section 103.

A. Independent Claim 1

The Office Action rejected claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Parupudi in view of Henry. The Applicants respectfully disagree, because the cited references fail to disclose, at least, retrieving context policy data and context information having multiple levels of specificity.

Specifically, the Office Action at page 3 asserts that Parupudi discloses "retrieving context policy data with the context policy enforcement engine, the context policy data defining a set of rules for responding to context requests." The Applicants respectfully disagree, because Parupudi does not disclose *context* policy data as recited in claim 1.

Parupudi fails to disclose retrieving *context* policy for responding to policy requests, instead appearing to disclose retrieving *enterprise* policy based on context. As disclosed by Parupudi at col. 25, line 63 to col. 26, line 5, enterprise policy defines access and usage rules relative to the enterprise's computing devices:

> Enterprise policy can be considered as a collection of rules established by the enterprise and enforceable, relative to the enterprise's computing devices, to define various parameters of the computing environment. Considerations such as who or which devices have access to which resources, how resources are to be used, how the computing device is to be used, where the computing device is to be used and not to be used and the like, can all be impacted, in some way, by the policies that the enterprise system administrators define.

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Parupudi further discloses at col. 26, lines 27-31, "methods and systems . . . for establishing and enforcing *enterprise policy* that take into account not only the context of the computing device but, advantageously, changes in the device's context." (Emphasis added.) Thus, Parupudi appears to disclose retrieving different *enterprise* policies based on *context*.

In contrast, claim 1 of the instant application recites "*context policy* data defining a set of rules for responding to context requests." (Emphasis added.) As further disclosed at Applicants' specification paragraph [0030], "The context policy rules may be embodied as any type of rule, collection of rules, and/or the like that define *how the computing device 100 should respond to various requests for context data*." (Emphasis added.) The *enterprise* policies disclosed by Parupudi do not provide any rules for responding to requests for context data. The Applicants submit that retrieving *enterprise* policies *based on* context as disclosed in Parupudi is different from retrieving *context* policies determining how to respond to context requests as recited in claim 1.

Further, the Office Action concedes at page 3 that Parupudi does not disclose "determining a level of specificity of a context characteristic for a context parameter associated with the requested context information as a function of the context policy data and an identity of the requesting entity" and "retrieving context data identified by the determined level of specificity of the context characteristic for the context parameter associated with the requested context information." To remedy such deficiency in Parupudi, the Office Action relies on Henry for these features. The Applicants respectfully disagree, because Henry does not disclose multiple levels of specificity for context information.

The present application discloses multi-dimensional content information with multiple levels of specificity. Claim 1 of the present application recites context data with multiple potential levels of specificity: "context data identified by the determined *level of specificity* of the *context characteristic* for the *context parameter* associated with the requested context

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information." (Emphasis added.) As further disclosed in Applicant's specification at paragraph [0022]:

> [I]n some embodiments the context of the user may be defined by a plurality of context parameters that each defines a particular aspect of the context of the user at a particular point in time. Such context parameters may include, for example, the location of the user, the current activity of the user, environmental data of the environment in which the user is located, biometric data of the user, and the like. Additionally each context parameter may have one or more characteristics associated therewith that define the level of specificity of the context parameter. Such characteristics may include, for example, the granularity of the context parameter data (e.g., what city is the user located in, what building is the user located in, what are the GPS coordinates of the user, etc.), the confidence of the context parameter (e.g., what is the likelihood that the context parameter data is accurate, what data collection methods were used, etc.), and the currency of the context parameter data (e.g., when was the data collected, how old is the data, when is the next context update, etc.).

As further disclosed at paragraph [0025], each context parameter-characteristic combination may have data at multiple levels of specificity:

> [T]he context of the user may be defined by a plurality of context parameters (e.g., location, activity, environmental aspects, etc.), each having an associated characteristic (e.g. granularity, confidence, currency, etc.). For each parameter-characteristic combination, *context data of varying levels of specificity* may be stored or otherwise determined such that requests for context data may be responded to with context data having a selected level of specificity as desired by the user.

(Emphasis added.)

In contrast, Henry does not appear to disclose content information having multiple levels of specificity. Henry discloses at paragraph [0027], "Contextual information that . . . includes, but is not limited to, location or presence information of the user, credit information regarding the user, recent user activity on the network, device type being used . . . , network load . . . , external factors . . . and whether the user opted in for an ad-subsidized mode during a session or

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transaction." Thus, Henry appears to disclose multiple *parameters* of the context information, but fails to disclose multiple *levels of specificity* for each parameter (e.g., Henry fails to disclose providing location information at the room, building, and campus levels of specificity).

Therefore, for at least those reasons, the Applicants submit that the proposed combination of Parupudi and Henry fails to disclose all of the features of claim 1. Thus, the Applicants submit that the cited references do not render claim 1 unpatentable under Section 103, and therefore, request that this rejection be withdrawn.

B. Independent Claim 21

The Office Action at pages 2-4 rejects claim 21 for the same reasons given for claim 1. Again, the Applicants respectfully disagree because the cited references fail to disclose retrieving context policy data and fail to disclose context information with multiple levels of specificity. Therefore, for at least the reasons discussed above in regard to independent claim 1, the Applicants respectfully submit that the proposed combination of Parupudi and Henry fails to disclose all of the features recited in claim 21. As such, the Applicants believe that the cited references do not render claim 21 unpatentable under Section 103, and therefore, request that this rejection be withdrawn.

C. Independent Claim 25

The Office Action at pages 9-11 rejects claim 25, applying similar reasoning to that given for claims 1 and 21. Again, the Applicants respectfully disagree because the cited references fail to disclose retrieving context policy data and fail to disclose content information with multiple levels of specificity. Therefore, for at least the reasons discussed above in regard to independent claim 1, the Applicants respectfully submit that the proposed combination of Parupudi and Henry fails to disclose all of the features recited in claim 25. As such, the Applicants believe that the cited references do not render claim 25 unpatentable under Section 103, and therefore, request that this rejection be withdrawn.

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D. Dependent Claims 2-20 and 22-24

Each of claims 2-20 includes independent claim 1 as a base claim and each of claims 22-24 includes independent claim 21 as a base claim. As such, the rejection of claims 2-20 and 22-24 should be withdrawn for the reasons hereinbefore discussed. *See In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988) ("Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious."). In light of the reasons for withdrawal of the present rejection of claims 1 and 21, any arguments specific to claims 2-20 and 22-24 are held in abeyance without prejudice or admission to any assertion made in the Office Action in order to expedite prosecution.

III. CONCLUSION

In view of the foregoing, it is submitted that this application is in a condition for allowance. Action to that end is hereby solicited. If there are any questions or comments that would expedite prosecution of this application, the Examiner is invited to call the undersigned at (317) 261-7959.

It is respectfully requested that, if necessary to effect a timely response, this paper be considered as a Petition for an Extension of Time sufficient to effect a timely response. The Commissioner is hereby authorized to charge the fee for such Petition, if needed, and any

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shortage of fees, and credit any overpayment of fees, to the Account of Barnes & Thornburg, Deposit Account No. 10-0435 with reference to file 45631-209480.

Respectfully submitted,

/Glen Kellett/

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Barnes & Thornburg LLP
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Fax: (317) 231-7433

INDS02 1230055v1

Petitioner Samsung Ex-1004, 0302

Electronic Acknowledgement Receipt

EFS ID:	13317405
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett/Stacy Rahman
Filer Authorized By:	Glen Madison Kellett
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	23-JUL-2012
Filing Date:	25-SEP-2009
Time Stamp:	17:11:48
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment After Final	P31880_Response.pdf	63867 b819de79475f80fb6442944d699ddd9ab9ff6e37	no	15
Warnings:					
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/567,386	09/25/2009	

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY ☐ RATE ($)	SMALL ENTITY ☐ FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT 07/23/2012

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDITIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 25	Minus	** 25	= 0	X $ =		OR	X $60=	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $ =		OR	X $250=	0
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))									
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
					TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/PEARLIE A. FENNELL/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

73486 7590 08/03/2012

Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

EXAMINER
YALEW, FIKREMARIAM A

ART UNIT	PAPER NUMBER
2436	

DATE MAILED: 08/03/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480	4223

TITLE OF INVENTION: METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	11/05/2012

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PTOL-85 (Rev. 02/11)

Petitioner Samsung Ex-1004, 0306

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

73486 7590 08/03/2012
Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480	4223

TITLE OF INVENTION: METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	11/05/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
YALEW, FIKREMARIAM A	2436	726-001000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:

❑ Issue Fee
❑ Publication Fee (No small entity discount permitted)
❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

❑ A check is enclosed.
❑ Payment by credit card. Form PTO-2038 is attached.
❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ❑ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Petitioner Samsung Ex-1004, 0307

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480	4223

73486 7590 08/03/2012

Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

EXAMINER	
YALEW, FIKREMARIAM A	

ART UNIT	PAPER NUMBER
2436	

DATE MAILED: 08/03/2012

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 353 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 353 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Petitioner Samsung Ex-1004, 0308

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No.	Applicant(s)	
	12/567,386	KOHLENBERG ET AL.	
	Examiner	Art Unit	
	FIKREMARIAM A. YALEW	2436	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *07/23/2012*.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-25*.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/FIKREMARIAM A YALEW/ Examiner, Art Unit 2436	07/30/2012

Petitioner Samsung Ex-1004, 0310

DETAILED ACTION

1. This correspondence is in response to **AMENDMENTS and REMARKS** filed on 07/23/2012.

2. **Claims 1-25** are pending.

Response to Arguments

3. Applicant's arguments with respect to the rejection of the pending claims over prior arts of record have been fully considered and are persuasive. The rejections of Claims 1-25 have been withdrawn.

Allowable Subject Matter

4. **Claims 1-25** are allowed. No reason for allowance is needed as the record is clear in light of further search conducted, claim amendments and applicant's arguments filed on 07/23/2012.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fikremariam Yalew whose telephone number is 5712723852. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Chea can be reached on 571-272-3951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/FIKREMARIAM A YALEW/

Examiner, Art Unit 2436

07/30/2012

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12567386	KOHLENBERG ET AL.
	Examiner	Art Unit
	FIKREMARIAM A YALEW	2436

SEARCHED

Class	Subclass	Date	Examiner
726	1(including with text search)	7/30/2012	FA
726	2(inlcuding with text search)	7/30/2012	FA
713	$(including with text search)	7/30/2012	FA
380	$(including with text search)	7/30/2012	FA
455	$.ccls.(including with text search)	7/30/2012	FA
709	$.ccls.(including with text search)	7/30/2012	FA

SEARCH NOTES

Search Notes	Date	Examiner
Updated East search,NPL search(Google, patent, google scholar),Inventor search	7/30/2012	FA

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
See	East search above	7/30/2012	FA

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

BIB DATA SHEET

CONFIRMATION NO. 4223

SERIAL NUMBER	FILING or 371(c) DATE RULE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
12/567,386	09/25/2009	726	2436	P31880 / 45631-209480

APPLICANTS

Tobias M. Kohlenberg, Portland, OR;
Selim Aissi, Beaverton, OR;
Dennis M. Morgan, Pine Grove, CA;
Alan D. Ross, Shingle Springs, CA;
Jim S. Baca, Corrales, NM;

**** CONTINUING DATA ***************************

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****
10/07/2009

Foreign Priority claimed ☐ Yes ☑ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /FIKREMARIAM A YALEW/ Examiner's Signature	☐ Met after Allowance FA Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		OR	5	25	3

ADDRESS

Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402
UNITED STATES

TITLE

METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

FILING FEE RECEIVED		
1480	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

Petitioner Samsung Ex-1004, 0314

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12567386	KOHLENBERG ET AL.
	Examiner	Art Unit
	FIKREMARIAM A YALEW	2436

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	07/30/2012								
	1	=								
	2	=								
	3	=								
	4	=								
	5	=								
	6	=								
	7	=								
	8	=								
	9	=								
	10	=								
	11	=								
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	19	=								
	20	=								
	21	=								
	22	=								
	23	=								
	24	=								
	25	=								

Petitioner Samsung Ex-1004, 0315

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	6	(determin$3 or check$3 or verify$3)near5 level with specificity with context	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:52
L2	0	726/1-3.ccls.and determin$3 with context with characheristic	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:53
L3	431	726/1-3.ccls.and determin$3 with context	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:53
L4	37	L3 and determin$3 with level with context	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:53
L5	3	L4 and context with characteristic	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:54
L6	16	(context and context with request and policy and context with parameter).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:56
L8	12	(context and context with request and policy and context with parameter and determin$3).clm.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:56
L12	42	"455"/$.ccls. and (determin$3 or check$3	US-PGPUB;	OR	OFF	2012/07/30

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		or verify$3 or validat$3)with context with policy	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			13:59
L13	198	"709"/$.ccls. and (determin$3 or check$3 or verify$3 or validat$3)with context with policy	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:59
L14	83	"713"/$.ccls. and (determin$3 or check$3 or verify$3 or validat$3)with context with policy	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:59
L15	24	"380"/$.ccls. and (determin$3 or check$3 or verify$3 or validat$3)with context with policy	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 13:59
L16	7	L12 and (context with (characteristic or parameter))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 14:00
L22	534	(determin$3 with context with policy) and ((granularity with context with parameter) or locat$3 or (GPS with coordiat$3))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 14:07
L23	79	L22 and 726/1-3.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 14:07
L26	64	(define with context with character)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 14:09
L27	0	L23 and L26	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT;	OR	OFF	2012/07/30 14:09

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			IBM_TDB			
L28	1	L26 and "726"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/07/30 14:10
S1	5106	726/1-2.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:12
S3	221	context with policy near5 context with request	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:14
S4	164	S3 and (mobile or comput$ with device or cellphone or ipad)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:15
S5	71	S4 and set with rules	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:16
S6	2	S5 and (updat$3 or upgrad$3 or renew or refresh$3)with context with policy with data	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:17
S8	32	S5 and location with user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19
S9	15	S8 and "726"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19
S10	8	S8 and "713"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2011/11/04 17:19

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			EPO; JPO; DERWENT; IBM_TDB			
S11	7	S8 and "380"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:19
S12	77	S1 and context with policy with data	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:21
S13	63	S12 and request	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:22
S14	32	S13 and location with user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:22
S15	6	("20050060575" or "20050003804" or "20020174073").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:25
S16	256	request with context with information same (context with (policy or rule))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:32
S17	37	S16 and S1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:32
S19	4	("20050003804" or "20020174073").pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:33
S20	2997	726/22.ccls.	US-PGPUB; USPAT;	OR	OFF	2011/11/04 17:34

Petitioner Samsung Ex-1004, 0319

			USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			
S21	1	S20 and S3	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:34
S22	0	Kohlengerg near tobias	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:35
S23	14	Kohlenberg near Tobias	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:35
S24	58	Aissi near Selim	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:35
S25	133	Morgan near Dennis	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S26	240	Ross near Alan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S27	16	Baca near Jim	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S28	4	S25 and S1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36

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S30	2	S27 and S1	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:36
S31	221	context with policy near5 context with request	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S32	164	S31 and (mobile or comput$ with device or cellphone or ipad)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S33	71	S32 and set with rules	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S34	6	S33 and (updat$3 or upgrad$3 or renew or refresh$3)with context with policy	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:53
S35	5106	726/1-2.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:55
S36	240	Ross near Alan	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:55
S37	7	S36 and S35	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:55
S38	256	request with context with information same (context with (policy or rule))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO;	OR	OFF	2011/11/04 17:56

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			DERWENT; IBM_TDB			
S39	37	S38 and S35	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:56
S40	17	S39 and location with user	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2011/11/04 17:56
S41	4	"20020035605"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:39
S42	0	reteriev$3 near5 (context adj data) same ((device with id) or (entity adj id))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:46
S43	0	reteriev$3 near5 (context adj data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:46
S44	435	retriev$3 near5 (context adj data)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:46
S45	0	retriev$3 near5 (context adj data)same ((context with policy) and (device with id) or (entity with id))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:48
S46	17	retriev$3 near5 (context adj data)and ((context with policy) and (device with id) or (entity with id))	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:48
S47	25	S44 and "713"/$.ccls.	US-PGPUB; USPAT; USOCR;	OR	OFF	2012/05/23 14:49

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			FPRS; EPO; JPO; DERWENT; IBM_TDB			
S48	3	S44 and "380"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:49
S49	32	S44 and "726"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:49
S50	14	S44 and "455"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 14:49
S57	12	("20090083768" or "20110113471" or "20080016580" or "20090271383" or "20090228953" or "20090271383" or "20080194233")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 18:54
S59	26	context adj parameter near5 context with information	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 19:03
S60	2	S59 and "726"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 19:04
S62	3	S59 and "709"/$.ccls.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 19:04
S64	4	"20020035605"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/23 19:52
S66	2	"20080016580"	US-PGPUB;	OR	OFF	2012/05/24

Petitioner Samsung Ex-1004, 0323

			USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			08:49
S67	12	("20090083768" or "20110113471" or "20080016580" or "20090271383" or "20090228953" or "20090271383" or "20080194233")	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/24 08:52
S68	2	wo-2006106303-$.did.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/24 16:41
S69	2	"20080194233"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/24 16:53
S70	0	"20090319806"	USPAT	OR	OFF	2012/05/29 17:10
S71	2	"20090319806"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/29 17:10
S72	2	"6750883".pn.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2012/05/29 17:11
S73	85	("4845744" | "5224150" | "5230048" | "5230072" | "5295261" | "5479476" | "5499032" | "5539922" | "5644740" | "5752243" | "5774540" | "5794142" | "5806017" | "5917911" | "5937164" | "5945985" | "5948040" | "5953722" | "5991756" | "6018570" | "6028551" | "6057845" | "6078826" | "6088717" | "6091956" | "6128759" | "6151601" | "6185569" | "6216087" | "6233448" | "6279007" | "6281896" | "6292833" | "6300936" | "6307573" | "6313791" | "6327535" | "6343291" | "6359892" | "6389288" | "6401051" | "6411899" | "6421072" | "6421544" | "6421716" | "6442620" | "6470344" | "6522875" | "6581062" | "6625615").PN. OR ("6750883").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/29 17:16

Petitioner Samsung Ex-1004, 0324

S74	103	("20020029291" | "20020081984" | "20020083025" | "20020111715" | "20020119788" | "20020120370" | "20020122055" | "20020156870" | "20050091223" | "4845744" | "5224100" | "5224150" | "5230048" | "5230072" | "5285261" | "5295261" | "5319775" | "5321815" | "5442805" | "5479476" | "5499032" | "5539922" | "5611050" | "5635940" | "5644740" | "5717387" | "5752243" | "5774540" | "5794142" | "5806017" | "5870751" | "5917911" | "5937164" | "5945985" | "5948040" | "5953722" | "5991756" | "6011973" | "6018570" | "6028551" | "6031545" | "6054989" | "6057845" | "6078826" | "6088717" | "6091956" | "6104344" | "6104980" | "6125446" | "6127947" | "6128759" | "6148261" | "6151601" | "6160553" | "6166738" | "6182136" | "6185569" | "6188405" | "6201973" | "6216087" | "6233448" | "6243093" | "6249252" | "6279007" | "6281896" | "6292833" | "6300936" | "6307573" | "6313791" | "6321092" | "6327535" | "6336138" | "6343291" | "6359892" | "6374177" | "6389288" | "6401051" | "6405020" | "6411220" | "6411899" | "6418533" | "6421072" | "6421544" | "6421716" | "6442620" | "6462706" | "6466918" | "6470344" | "6470354" | "6513059" | "6522875" | "6525768" | "6553310" | "6581062" | "6594666" | "6625615" | "6628928" | "6748225" | "6750883" | "6823354" | "6918537").PN. OR ("7072956").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2012/05/29 17:39

7/30/2012 2:11:18 PM
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Petitioner Samsung Ex-1004, 0325

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12567386	KOHLENBERG ET AL.
	Examiner	**Art Unit**
	FIKREMARIAM A YALEW	2436

ORIGINAL		INTERNATIONAL CLASSIFICATION															
CLASS	SUBCLASS	CLAIMED										NON-CLAIMED					
726	1	G	0	6	F	17 / 00 (2006.01.01)											
CROSS REFERENCE(S)																	
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)																
709	223																
455	411																
713	193																

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17												
	2		18												
	3		19												
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	9		25												
	10														
	11														
	12														
	13														
	14														
	15														
	16														

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	25	
/FIKREMARIAM A YALEW/ Examiner.Art Unit 2436	07/30/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Petitioner Samsung Ex-1004, 0326

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Kohlenberg, Tobias M.
Art Unit	2432
Examiner Name	Barron, Gilberto Jr.
Attorney Docket Number	P31880

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	1	2302886	EP	A1	2011-03-30	Kohlenberg, et al.		☐

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Receipt date: 05/19/2011	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2009-09-25
	First Named Inventor	Kohlenberg, Tobias M.
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

	1	Office Action Received for European Patent Application No.10251637.4 mailed on March 22, 2011, 7 pages.	☐

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Tobias M. Kohlenberg
Art Unit	2432
Examiner Name	Barron Jr., Gilberto
Attorney Docket Number	P31880/45631-209480

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	1	20050003804	A1	2005-01-06	Huomo et al.	
	2	20020174073	A1	2002-11-21	Nordman et al.	

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	1	2006/106303	WO	A1	2006-10-12	British Telecommunications Public Limited Company		☐
	2	1217857	EP	A2	2001-12-19	Microsoft Corporation		☐

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

Receipt date: 04/28/2011	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron Jr., Gilberto
	Attorney Docket Number	P31880/45631-209480

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	European Search Report for EP Application No. 10251637.4-2414, February 22, 2011, 3 pages.	☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature	/Fikremariam Yalew/	Date Considered	10/01/2012

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed
PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

U.S.PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S.PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20050060575	A1	2005-03-17	Trethewey, et al.	

If you wish to add additional U.S. Published Application citation information please click the Add button.

FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2]	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

EFS Web 2.1.17

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

Receipt date: 07/21/2011	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2432
	Examiner Name	Barron, Gilberto Jr.
	Attorney Docket Number	P31880

	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature	/Fikremariam Yalew/	Date Considered	10/01/2012

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

73486 7590 08/03/2012

Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480	4223

TITLE OF INVENTION: METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	$1740	$300	$0	$2040	11/05/2012

EXAMINER	ART UNIT	CLASS-SUBCLASS
YALEW, FIKREMARIAM A	2436	726-001000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Barnes & Thornburg LLP
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Intel Corporation

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Santa Clara, CA

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☒ Issue Fee

☒ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

☐ A check is enclosed.

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

☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 504238 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Glen M. Kellett/ Date November 2, 2012

Typed or printed name Glen M. Kellett Registration No. 60,202

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

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Petitioner Samsung Ex-1004, 0333

Electronic Patent Application Fee Transmittal

Application Number:	12567386
Filing Date:	25-Sep-2009
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Filer:	Glen Madison Kellett
Attorney Docket Number:	P31880 / 45631-209480

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl issue fee	1501	1	1770	1770
Publ. Fee- early, voluntary, or normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**2070**

Electronic Acknowledgement Receipt

EFS ID:	14140591
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Glen Madison Kellett
Filer Authorized By:	
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	02-NOV-2012
Filing Date:	25-SEP-2009
Time Stamp:	17:32:16
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2070
RAM confirmation Number	4707
Deposit Account	504238
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Issue Fee Payment (PTO-85B)	FeeTransmittal.pdf	117159 d9d0f4977b61ab7bbb9855addac22e090354260f	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	32025 4f17254f0ba7216291a8f78772679747fec89201	no	2
Warnings:					
Information:					
			Total Files Size (in bytes):	149184	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/567,386	12/04/2012	8327416	P31880 / 45631-209480	4223

73486 7590 11/14/2012

Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 423 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Tobias M. Kohlenberg, Portland, OR;
Selim Aissi, Beaverton, OR;
Dennis M. Morgan, Pine Grove, CA;
Alan D. Ross, Shingle Springs, CA;
Jim S. Baca, Corrales, NM;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

Petitioner Samsung Ex-1004, 0338

PTO/SB/80 (11-09)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 73486

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 73486

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Intel Corporation
2200 Mission College Boulevard
Santa Clara, CA 95054

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	/Heather L. Adamson/	Date	10/19/2011
Name	Heather L. Adamson	Telephone	503-712-5273
Title	Administrator of Patents		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	14241967
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Christopher A. Singh/Richard Beck
Filer Authorized By:	Christopher A. Singh
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	15-NOV-2012
Filing Date:	25-SEP-2009
Time Stamp:	17:56:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		P31880_373b.pdf	588757 bee42bf3331daed424c3ad3f88ceaef0712d7242	yes	2

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Assignee showing of ownership per 37 CFR 3.73.	1	1
	Power of Attorney	2	2

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Information:

Total Files Size (in bytes):	588757

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/96 (07-09)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Tobias M. Kohlenberg

Application No./Patent No.: 12/567,386 Filed/Issue Date: September 25, 2009

Titled: METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

Intel Corporation , a corporation

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 025157, Frame 0332, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/CHRISTOPHER A. SINGH/ November 15, 2012

Signature Date

CHRISTOPHER A. SINGH Attorney

Printed or Typed Name Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Doc code: RCEX
Doc description: Request for Continued Examination (RCE)

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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REQUEST FOR CONTINUED EXAMINATION(RCE)TRANSMITTAL
(Submitted Only via EFS-Web)

Application Number	12567386	Filing Date	2009-09-25	Docket Number (if applicable)	P31880/45631-209480	Art Unit	2436
First Named Inventor	Tobias M. Kohlenberg			Examiner Name	Yalew, Fikremariam A.		

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. The Instruction Sheet for this form is located at WWW.USPTO.GOV

SUBMISSION REQUIRED UNDER 37 CFR 1.114

Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

- ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____
- ☐ Other _____

☒ Enclosed

- ☐ Amendment/Reply
- ☒ Information Disclosure Statement (IDS)
- ☐ Affidavit(s)/ Declaration(s)
- ☐ Other _____

MISCELLANEOUS

☐ Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of months _____
(Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

☐ Other _____

FEES

☒ **The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.**
The Director is hereby authorized to charge any underpayment of fees, or credit any overpayments, to Deposit Account No 504238

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

☒ Patent Practitioner Signature

☐ Applicant Signature

PTO/SB/30EFS (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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Signature of Registered U.S. Patent Practitioner			
Signature	/CHRISTOPHER A. SINGH/	Date (YYYY-MM-DD)	2012-11-15
Name	CHRISTOPHER A. SINGH	Registration Number	61236

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If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Petitioner Samsung Ex-1004, 0345

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Tobias M. Kohlenberg
Art Unit	2436
Examiner Name	Yalew, Fikremariam A.
Attorney Docket Number	P31880/45631-209480

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5960442	A	1999-09-28	Pickering	English equivalent of JP 2001-523074 below.

If you wish to add additional U.S. Patent citation information please click the Add button. Add

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2008-539500	JP	A	2008-11-13	Telefonaktiebolaget LM Ericsson	Japanese equivalent of WO 2006/115442 below.	☒
	2	2006/115442	WO	A1	2006-11-02	Telefonaktiebolaget LM Ericsson	English equivalent of JP 2008-539500 above.	☐
	3	2001-523074	JP	A	2001-11-20	Genesys Telecommunications Laboratories, Inc.	Japanese equivalent of US 5,960,442 above.	☒

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2436
	Examiner Name	Yalew, Fikremariam A.
	Attorney Docket Number	P31880/45631-209480

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	1	Office Action received for Japanese Patent Application No. 2010-206462, mailed October 2, 2012, 3 pages of Japanese Office Action and 4 pages of unofficial English translation.	☒
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EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	12567386
	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2436
	Examiner Name	Yalew, Fikremariam A.
	Attorney Docket Number	P31880/45631-209480

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/CHRISTOPHER A. SINGH/	Date (YYYY-MM-DD)	2012-11-15
Name/Print	CHRISTOPHER A. SINGH	Registration Number	61236

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Petitioner Samsung Ex-1004, 0349

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特表2008-539500
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(51)Int.Cl.		F I			テーマコード（参考）
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		G06F	13/00	358E	

審査請求 未請求　予備審査請求 有　（全 31 頁）

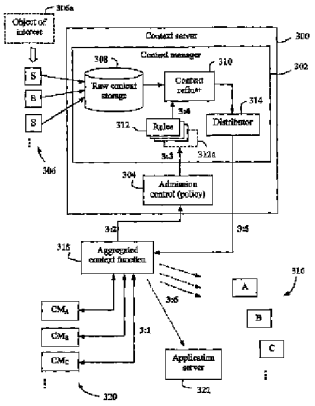
(21)出願番号	特願2008-508789 (P2008-508789)
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(85)翻訳文提出日	平成19年11月13日 (2007.11.13)
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(87)国際公開番号	WO2006/115442
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(71)出願人　598036300
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最終頁に続く

(54)【発明の名称】コンテクスト情報を提供する方法および装置

(57)【要約】
通信ネットワークにおいて、注目オブジェクト（３０６ａ）についてのコンテクストを保持するコンテクストサーバ（３１８）からコンテクスト情報を入手する方法および装置を提供する。コンテクストサーバは、注目オブジェクトに関連付けられたセンサ（３０６）から、生のコンテクストデータを受け取る。注目オブジェクトに関連して精緻化されたコンテクスト情報を求める要求を要求側当事者から受け取る。要求側当事者のうち少なくとも１つの個別エンティティ（３１６）について、個別コンテクストデータが集められる。受け取った個別のコンテクストデータに基づいて、カスタマイズされたルールが作成される。ルールは、注目オブジェクトに関する精緻化されたコンテクスト情報を求める適応された要求の中の条件を定義するが、要求は、カスタマイズされたルールを含めて、注目オブジェクトのコンテクストサーバへ送信される。次いで、カスタマイズされたルールに従って精緻化されたコンテクストデータを、コンテクストサーバから受け取る。



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【特許請求の範囲】
【請求項１】
通信ネットワークにおいて、注目オブジェクト（３０６ａ）に関するコンテクストを保持するコンテクストサーバ（３００，４０６，６１４）からコンテクスト情報を取得する方法であって、前記コンテクストサーバは、前記注目オブジェクトに関連付けられたセンサ（３０６）から生のコンテクストデータを受信し、当該方法は、
前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求める要求を、要求側当事者から受信するステップと、
前記要求側当事者のうちの少なくとも１つの個別エンティティ（３１６，４０４）に関する個別コンテクストデータを収集するステップと、
前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求めるために適応された要求における条件を定義する、カスタマイズされたルールを、前記受信された個別コンテクストデータに基づいて作成するステップと、
前記カスタマイズされたルールを含む前記適応された要求を、前記注目オブジェクトの前記コンテクストサーバへ送信するステップと、
前記ルールに従って精緻化されたコンテクストデータを前記コンテクストサーバから受信するステップと、
を備えることを特徴とする方法。
【請求項２】
前記個別コンテクストデータは、単数又は複数の前記個別エンティティに関するコンテクストを保持する少なくとも１つのコンテクストマネジャから収集されることを特徴とする請求項１に記載の方法。
【請求項３】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記個別コンテクストデータは、各々の前記個別エンティティから収集され、
前記受信された個別コンテクストデータは、グループコンテクストとして集合化され、
前記カスタマイズされたルールは、前記グループコンテクストから作成される
ことを特徴とする請求項１又は２に記載の方法。
【請求項４】
前記個別コンテクストデータを収集するためにコンテクストテンプレート構造が使用され、
前記コンテクストテンプレート構造は、前記要求側当事者の現在のコンテクストデータによって記入される、前記要求側当事者に関連するパラメータのための事前定義されたデータフィールドを含む
ことを特徴とする請求項１乃至３のいずれか１項に記載の方法。
【請求項５】
前記コンテクストテンプレート構造は、ＩＭＳインタフェースによってＳＩＰ／Ｓｉｍｐｌｅプロトコルを使用して通信される、ＸＤＭドキュメントとして提供されることを特徴とする請求項４に記載の方法。
【請求項６】
前記コンテクストテンプレート構造は、要求側当事者を一般的に定義する基本データのための標準フィールドを含む一般テンプレートを、前記コンテクストパラメータのためのフィールドを更に含む応用テンプレートへと拡張することによって生成されることを特徴とする請求項４又は５に記載の方法。
【請求項７】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記一般テンプレートは、グループ識別情報、グループメンバ、および使用されるのであれば任意でグループ管理者、のための標準フィールドを含む
ことを特徴とする請求項６に記載の方法。
【請求項８】

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前記要求側当事者は、複数の個別エンティティのグループであり、
前記応用テンプレートは、各々の前記個別エンティティのためのパラメータフィールドを含む
ことを特徴とする請求項６又は７に記載の方法。
【請求項９】
通信ネットワークにおいて、注目オブジェクト（３０６ａ）に関するコンテクストを保持するコンテクストサーバ（３００，４０６，６１４）からコンテクスト情報を取得する装置であって、前記コンテクストサーバは、前記注目オブジェクトに関連付けられたセンサ（３０６）から生のコンテクストデータを受信し、当該装置は、
前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求める要求を、要求側当事者から受信する手段と、
前記要求側当事者のうちの少なくとも１つの個別エンティティ（３１６，４０４）に関する個別コンテクストデータを収集するコンテクスト収集ユニット（４１０，６０４）と、
前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求めるために適応された要求における条件を定義する、カスタマイズされたルールを、前記受信された個別コンテクストデータに基づいて作成するコンテクスト集合化ユニット（４１２，６０６）と、
前記カスタマイズされたルールを含む前記適応された要求を、前記注目オブジェクトの前記コンテクストサーバへ送信する手段と、
前記ルールに従って精緻化されたコンテクストデータを前記コンテクストサーバから受信する手段と、
を備えることを特徴とする装置。
【請求項１０】
前記コンテクスト収集ユニットは、単数又は複数の前記個別エンティティに関するコンテクストを保持する少なくとも１つのコンテクストマネジャから前記個別コンテクストデータを収集するように更に適合されることを特徴とする請求項９に記載の装置。
【請求項１１】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記コンテクスト収集ユニットは、各々の前記個別エンティティから前記個別コンテクストデータを収集するように更に適合され、
前記コンテクスト集合化ユニットは、前記受信された個別コンテクストデータをグループコンテクストとして集合化し、前記グループコンテクストから前記カスタマイズされたルールを作成するように更に適合される
ことを特徴とする請求項９又は１０に記載の装置。
【請求項１２】
前記コンテクスト収集ユニットは、前記個別コンテクストデータを収集するためにコンテクストテンプレート構造を使用するように更に適合され、
前記コンテクストテンプレート構造は、前記要求側当事者の現在のコンテクストデータによって記入される、前記要求側当事者に関連するパラメータのための事前定義されたデータフィールドを含む
ことを特徴とする請求項９乃至１１のいずれか１項に記載の装置。
【請求項１３】
前記コンテクスト収集ユニットは、前記コンテクストテンプレート構造として、ＩＭＳインタフェースによってＳＩＰ／Ｓｉｍｐｌｅプロトコルを使用して通信されるＸＤＭドキュメントを使用するように更に適合されることを特徴とする請求項１２に記載の装置。
【請求項１４】
前記コンテクスト収集ユニットは、要求側当事者を一般的に定義する基本データのための標準フィールドを含む一般テンプレートを、前記コンテクストパラメータのためのフィールドを更に含む応用テンプレートへと拡張することによって、前記コンテクストテンプ

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レート構造を作成するように更に適合されることを特徴とする請求項１２又は１３に記載の装置。
【請求項１５】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記一般テンプレートは、グループ識別情報、グループメンバ、および使用されるのであれば任意でグループ管理者、のための標準フィールドを含む
ことを特徴とする請求項１４に記載の装置。
【請求項１６】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記応用テンプレートは、各々の前記個別エンティティのためのパラメータフィールドを含む
ことを特徴とする請求項１４又は１５に記載の装置。
【請求項１７】
通信ネットワークにおいて、注目オブジェクトに関するコンテクストを保持するコンテクストサーバ（３００，４０６，６１４）からコンテクスト情報を提供する方法であって、前記コンテクストサーバは、前記注目オブジェクトに関連付けられたセンサ（３０６）から生のコンテクストデータを受信し、当該方法は、
要求側当事者から発生した、前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求めるために適応された要求であって、前記要求側当事者のうちの少なくとも１つの個別エンティティ（３１６，４０４）に関して収集された個別コンテクストデータに基づいて作成された、当該適応された要求における条件を定義するカスタマイズされたルール（３１２ａ，４１４）を含む要求を受信するステップと、
前記受信されたカスタマイズされたルールを適用することによって前記生のコンテクストデータを精緻化するステップと、
前記要求側当事者への配信のために前記精緻化されたコンテクスト情報を提供するステップと、
を備えることを特徴とする方法。
【請求項１８】
前記受信されたカスタマイズされたルールは、グループメンバの複数の個別コンテクストから集合化されたグループコンテクストから導出されることを特徴とする請求項１７に記載の方法。
【請求項１９】
通信ネットワークにおいて、注目オブジェクトに関するコンテクストを保持するコンテクストサーバ（３００，４０６，６１４）からコンテクスト情報を提供する装置であって、前記コンテクストサーバは、前記注目オブジェクトに関連付けられたセンサ（３０６）から生のコンテクストデータを受信し、当該装置は、
要求側当事者から発生した、前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求めるために適応された要求であって、前記要求側当事者のうちの少なくとも１つの個別エンティティ（３１６，４０４）に関して収集された個別コンテクストデータに基づいて作成された、当該適応された要求における条件を定義するカスタマイズされたルール（３１２ａ，４１４）を含む要求を受信する手段と、
前記受信されたカスタマイズされたルールを適用することによって前記生のコンテクストデータを精緻化する手段と、
前記要求側当事者への配信のために前記精緻化されたコンテクスト情報を提供する手段と、
を備えることを特徴とする装置。
【請求項２０】
前記受信されたカスタマイズされたルールは、グループメンバの複数の個別コンテクストから集合化されたグループコンテクストから導出されることを特徴とする請求項１９に記載の装置。

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【発明の詳細な説明】
【技術分野】
【０００１】
本発明は、一般に、通信ネットワークにおいて要求されたコンテクスト情報を提供もしくは取得する方法および装置に関するものである。詳細には、本発明は、要求側当事者からの仕様に従って、コンテクスト情報を提供もしくは取得することに関するものである。
【背景技術】
【０００２】
３Ｇ移動電話の出現で、パケットベースの新たな通信技術が、マルチメディアコンテンツを通信するために開発された。例えば、ＧＰＲＳ（Ｇｅｎｅｒａｌ Ｐａｃｋｅｔ Ｒａｄｉｏ Ｓｅｒｖｉｃｅ：汎用パケット無線サービス）およびＷＣＤＭＡ（Ｗｉｄｅｂａｎｄ Ｃｏｄｅ Ｄｉｖｉｓｉｏｎ Ｍｕｌｔｉｐｌｅ Ａｃｃｅｓｓ：広帯域符号分割多元接続）の技術は、従来の回路交換型音声通話に加えて、画像、テキスト、文書、アニメーション、音声ファイル、ビデオクリップ等を表すデータのパケット交換型通信に関する、無線マルチメディア電話サービスをサポートする。さらに、高解像度カラー・ディスプレイやさまざまなフォーマットのための複数のコーデック（符号器／復号器）を含む、新しいサービスに対応する機能を備えた高性能の新しい移動端末も市場に登場している。これらの端末は、通常、ネットワーク構成およびセルの特性次第で、異なるアクセス技術にも対応できる。
【０００３】
最近、「ＩＰマルチメディア・サブシステム（ＩＭＳ）」と呼ばれるサービス・ネットワーク・アーキテクチャが、第３世代パートナシップ・プロジェクト（３ＧＰＰ）によってオープンスタンダードとして開発され、パケット分野においてモバイル・クライアントのためのマルチメディアサービスを提供している。一般にＩＭＳは、用いられるアクセス技術にはほとんど依存せず、また、基本的に、いかなる一連の限られた特定のサービスにも限定されない、ＩＰトランスポートに基づいたサービスを可能にするプラットフォームである。
【０００４】
「ＳＩＰ」（ＩＥＴＦ ＲＦＣ３２６１標準その他に従う、セッション開始プロトコル）と呼ばれるセッション開始のための仕様がすでに定められているが、これは、パケット交換型の論理上でセッションを制御する（例えば、生成する、修正する、終了する）ための、アプリケーション・レイヤのシグナリング・プロトコルである。ＳＩＰは、一般に、マルチメディアセッションを処理するため、ＩＭＳネットワークによって使用される。また、一部のサービスを扱うため、「Ｓｉｍｐｌｅ」と呼ばれる、基本のＳＩＰプロトコルの拡張部分が用いられることもある。
【０００５】
図１は、ＩＭＳサービスネットワークを用いてマルチメディアサービスを提供するための、非常に単純化された基本的な通信シナリオを、概略的に図解する図である。留意すべきだが、この図は、本発明の背景となる技術を理解するのに役立つネットワーク要素だけを選定して示している。簡単に述べると、発呼側の移動端末Ａが、第１の無線アクセスネットワーク１００に接続され、１つ以上のマルチメディアサービスを含む通信セッションＳにおいて、第２の無線アクセスネットワーク１０２に接続されている着呼側の移動端末Ｂと通信する。あるいは、端末Ａは、固定端末もしくはコンピュータと通信してもよいし、例えば音楽作品や映画やゲームなどの何らかのマルチメディアコンテンツを端末へ配信するコンテンツサーバと通信してもよい。また、端末Ａ、Ｂは、以下に述べるような情報サービスを提供するＩＭＳネットワーク内のサーバと通信してもよい。
【０００６】
ＩＭＳネットワーク１０４が、第１の無線アクセスネットワーク１００に接続され、端末Ａに関するマルチメディアセッションＳを処理していることを示す。従って、ＩＭＳネットワーク１０４は、端末Ａからのサービス要求であれば、いかなるサービス要求であっ

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てもそれを受け取って処理する。同様に、対応するＩＭＳネットワーク１０６は、端末Ｂのためにセッションｓを処理し、そして、２つのＩＭＳネットワーク１０４および１０６は、異なる運用事業者によって制御されてもよい。あるいは、端末ＡおよびＢは、もちろん、同じアクセスネットワークに接続されてもよいし、あるいは、同じＩＭＳネットワークによってサービス提供されてもよいし、その両方であってもよい。

【０００７】

図解されたセッションＳは、大まかにブロック１０８によって示す各種の適切なセッション管理ノードによって、ＳＩＰシグナリングを用いて制御される。一般に、セッション管理ノードタイプには、Ｓ－ＣＳＣＦ（在圏呼セッション制御機能）、Ｉ－ＣＳＣＦ（問い合わせ呼セッション制御機能）、およびＰ－ＣＳＣＦ（プロキシ呼セッション制御機能）がある。呼び出されたマルチメディアサービスは、複数のアプリケーションサーバ１１０によって、起動され、実行される。さらに、主要なデータベース要素であるＨＳＳ（ホーム加入者サーバ）１１２は、加入者データおよび認証データだけでなく、サービス情報、特に、クライアントのためにサービスを実行するためアプリケーションサーバ１１０が取って来ることのできるサービス情報をも格納する。ＩＭＳネットワーク要素である１０８－１１２の各種機能は、本発明を理解するためここでこれ以上記述することが必要なわけではない。もちろん、ＩＭＳネットワーク１０４は、さらに、多くの他のノードや機能を含んでいるが、簡潔にするため、ここでは示していない。

【０００８】

ＩＭＳネットワークによって採用されうるサービスの一例として、いわゆる「プレゼンス」サービスがある。このタイプのサービスにおいて、「プレゼンス」は、基本的に、クライアントの動的かつ可変の状態のプロファイルであり、プレゼンスサービスは、基本的に、他のユーザやアプリケーションがそれを利用できるようにするため、クライアントの「プレゼンスデータ」を公開することを含み、それらがさらに今度は、他のサービスを制御するのに使用されてもよい。プレゼンスデータは、基本的に、いくつかの事前定義された観点における、クライアントおよび彼／彼女の装置の状態もしくは状況を定義する。従って、「プレゼンス」という用語は、ここでは、非常に広い意味を与えられ、そしてプレゼンスデータは、例えば下記の「クライアントの状態」を含んでもよい。

－例えば、応答可能、取り込み中、会議中、休暇中などのクライアントの状態。
－例えば、電源が入っている／入っていない、使用中、圏外などの端末の状態。
－クライアント／端末の地理的位置。
－例えば、ＳＭＳ、ＭＭＳ、チャット、ゲーム、ビデオなどの機能についての、端末の能力および選択。
－例えば、興味、職業、個人的特徴、気分など、上記以外の個人的なクライアント情報。

【０００９】

この情報は、もしくは、ここから選択されたあらゆる部分情報は、クライアントがいかなるものであっても自分のプレゼンスデータを変更する場合にはいつでも、ネットワークもしくはクライアントから受け取ったいわゆる「イベントの発行(publications of events)」に基づいて、ＩＭＳネットワーク内のアプリケーションサーバ内に格納される。また、クライアントは、例えばユーザのリストに従って、１人以上の他のユーザについての選択されたプレゼンスデータに加入(subscribe)してもよい。そのようなプレゼンス加入も、通常、ＩＭＳネットワーク内のアプリケーションサーバによって取り扱われる。次いで、加入しているクライアントは、現在のプレゼンスデータに関して、自動的にもしくは要求に応じて、通知を受け取ることができる。ＳＩＰにおいては、ＩＭＳネットワーク内のアプリケーションサーバに動的データを提供するため、クライアントは「ＳＩＰ　ＰＵＢＬＩＳＨ」と呼ばれるメッセージを使用することができる。さらに、アプリケーションサーバによって処理される、他のクライアントの動的データについて加入するため、クライアントは「ＳＩＰ　ＳＵＢＳＣＲＩＢＥ」と呼ばれる別のメッセージを使用することもできる。

【００１０】

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従来型の通信システムでは、通信チャネルは多かれ少なかれ固定されていて静的であり、ビットレートやプロトコルが予想できる。しかし、新しいアクセス技術を用いた場合、無線ネットワーク内で利用できる通信リソースは極めて多様化し、１つの通話セッションの中でさえ異なるタイプの接続を使用する可能性があるため、ネットワーク環境は、ユーザにとって、より動的で不均一なものとなる。その結果、ビットレートや変調や符号化のスキームが、非常に変動的になる。しかも、ネットワーク内で、そしてネットワークをまたいであちこち移動するユーザは、そのような変化には関係なく、各種のサービスにアクセスでき、利用できることを期待する。従って、現在のユーザの状況およびネットワーク環境に適合しうる、あるいは「合わせ」うる、サービスを開発することが望ましい。

【００１１】

最近、呼び出されたサービスのためのアプリケーションの使用可能性を高めるため、オブジェクトの現在の状況に応じて、オブジェクトに関する精緻化(refine)された情報を提供するという概念が発達してきた。ここでいう「オブジェクト」とは、通常は、人間であるユーザであるが、物理的デバイスもしくは装置、あるいは顧客に商品やサービスを提供している企業であってもよい。本明細書においては、そのようないかなるオブジェクトを表現するのにも、「注目オブジェクト(object of interest)」という用語が用いられるであろう。この新たな概念は、一般に、「コンテクスト」情報の配信と呼ばれ、上記のプレゼンスサービスと同様のメカニズムを用いて実装されてもよい。従って、普及している環境に最適に適合されたサービスを実現するには、「コンテクストを意識する(context-aware)」アプリケーションを開発することが望ましい。

【００１２】

これについては、移動ユーザがナビゲーション補助に関する通信サービスを呼び出した場合の、第１の例によって例示することができる。このとき、この場合の注目オブジェクトである、そのユーザについて、ＩＭＳサーバ内でコンテクストが定義されることになる。コンテクストは、例えば、ユーザがログオンしているかぎり、あるいはユーザがＩＭＳネットワークの加入者であるかぎり、サーバ内で保持されてもよい。次いで、このサービスに用いられるアプリケーションが、ユーザの現在のコンテクストを調査し、そして、コンテクストによって与えられる、例えばユーザの好み、現在位置、および現在の通信接続タイプに応じて、一定の特徴を含むまたは除くように適応された地図をユーザに提供してもよい。この場合、ユーザの状況を反映するコンテクスト情報は、このように、最適な提示形式、すなわち、表示された地図を作成するために使用可能である。

【００１３】

図２は、注目オブジェクトについてのコンテクスト情報を要求側エンティティすなわち「コンテクスト消費者」に提供するための、以前から提案されているサーバ構成を図解する図である。図に示すコンテクストサーバ２００は、「要求側当事者」２０２としてここに一般的に図解された、あらゆる許可されたユーザ、装置、もしくはアプリケーションに対して、コンテクスト情報を提供するように構成されている。留意すべきだが、コンテクスト情報を保持する対象である注目オブジェクトは、人物、デバイス、装置、システム等であってもよい。さらに、要求側当事者２０２は、同様に、人物、例えば上記のプレゼンス加入者であってもよいし、デバイスであってもよい。また、要求側当事者２０２は、例えば上記のナビゲーション補助サービスなどのサービスを可能にするのに用いられるアプリケーションであってもよい。

【００１４】

コンテクストサーバ２００は、以下で説明するが、コンテクストマネジャ２０４、アドバタイザ２０６、および承認管理（アドミッションコントロール）機能２０８を含む。コンテクストマネジャ２０４は、センサＳ（２１０）として示す各種のソースからオブジェクトデータを受け取ることによって、ここで点線のボックス２１０ａとして概略的に図解する注目オブジェクトに関する情報を、連続的に収集する。センサ２１０は、オブジェクト２１０ａの現在の状態、状況または事情を特徴付ける各種の「変数」またはそれに類似したものを測定または記録(register)するように構成される。例えば、センサは、物理的

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特性、例えば温度を測定するように構成されてもよいし、あるいは、現在のオブジェクト状況の一部、例えばプレゼンスサービスについて上で述べたクライアントの状態のうちのいずれかを記録するように構成されてもよい。別の具体的な例として、注目オブジェクトは電源スイッチであってもよく、その場合、１個のセンサが、スイッチがオンになっているかオフになっているかを単に記録するように構成されてもよい。

【００１５】

センサ２１０からの生のコンテクストデータは、コンテクストマネジャ２０４の中のコンテクスト格納ユニット２１２で受け取られ、格納される。次いで、生データから新たな精緻化されたコンテクスト情報を導出または算出するため、所定のルール２１６を生データに適用することによって、格納された生データがコンテクスト精緻化器２１４内で処理され、精緻化されてもよい。所定のルール２１６は、生データから一定のパラメータを算出し、結論を引き出し、あるいは、編集物を作成する、アルゴリズムまたはそれに類似したものを含んでもよい。例えば、上記の電源スイッチの場合、各種の統計的パラメータを導出するようにルールが定義されてもよい。１つのルールが、スイッチがオンの時間とオフの時間それぞれの合計時間を算出してもよい。他のルールが、スイッチがオンであった持続時間とオフであった持続時間について最大持続時間、最小持続時間、および平均持続時間をそれぞれ算出するなどしてもよい。

【００１６】

次いで、精緻化されたコンテクストが、配信器２１８によって、あらゆる要求側当事者に対しても正確に配信されてもよい。要求側当事者２０２は、まず、アドバタイザ２０６からの適切な情報に従って何らかの「公開」メカニズムによって提供された広告または発表をチェックすることによって、どのようなコンテクスト情報がコンテクストサーバから入手できるかを発見することができる。例えば、図に点線で示すように、別個のサーバまたはそれに類似したものによって、利用可能なコンテクスト情報に関する広告または発表が公開されてもよい。次いで、要求側当事者２０２は、コンテクスト情報の要求を行うことができ、この要求は承認管理ユニット２０８によって受け取られる。このユニット２０８は、注目オブジェクトのコンテクスト情報を要求側当事者２０２が受け取ることが許可されているのかどうかを判断するためのポリシーをコンテクスト要求に対して適用するように構成される。ポリシーは基本的に、コンテクストの所有者、例えばネットワーク運用事業者によって定義済みである。もし許可されていれば、要求側当事者２０２に最新のコンテクスト情報を提供するため、承認管理ユニット２０８が配信器２１８をトリガする。また、ポリシーは、利用可能なコンテクスト情報の一部だけを特定の要求側が受け取ることができるよう、指示してもよい。留意されるべきだが、コンテクスト要求は、多かれ少なかれ継続的にコンテクストサーバからコンテクスト情報を受け取るための加入についての要求であってもよい。

【００１７】

通常、コンテクスト情報は、個別のオブジェクト、例えば１人の人物に関係する。しかし、オブジェクトは、メンバ達によって共有される集合的なプロファイルを有する、オブジェクトのグループ、例えば複数の人物、に属していてもよい。グループの会員資格（メンバシップ；会員であること）それ自体が、個別のコンテクストにおけるパラメータとみなされてもよい。例えば、家族のメンバはそれぞれ個別のコンテクストを有してもよいが、他方、家族はそのメンバによって共有される集合的なプロファイルを備えた共通のコンテクストを有してもよい。現在は、個人または装置のグループについての集合的なコンテクストを作成するために利用できるメカニズムが存在しない。

【発明の開示】

【発明が解決しようとする課題】

【００１８】

上述の図２のソリューションを用いれば、精緻化されたコンテクスト情報を作成するルールは事前定義され、確定されており、精緻化されたコンテクスト情報は、許可されたあらゆる要求側当事者に提供されうる。この方法では、要求側当事者はその所定の形式に従

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うコンテクストを受け取れるだけであり、それが必ずしも要求側当事者が必要なものもしくは望むものではないことがあるため、このことは、時に問題となる。しかし、現在、所定の（事前定義された）コンテクストの精緻化だけに限られており、要求側当事者の具体的なニーズを満たす柔軟なソリューションは存在しない。また、要求側当事者は、ポリシーによって制限されることもあるが、たとえ利用可能なコンテクスト情報の一部は必要でないときでも、それをすべて受け取ることになる。

【００１９】

さらに、グループの会員資格は、現在、個別のコンテクスト内のパラメータとして表現されるにすぎない。しかし、グループは、そのメンバがアクティブであるか否かにかかわらず存在しうるものであり、また、そのメンバが実際にはグループを去ったときですら存続することがある。個別のコンテクストにおいてはそのグループのコンテクストの集合的なプロファイルは無視されるので、グループの会員資格が個別のコンテクストにおけるパラメータであるとき、これは問題をひき起こすことがある。

【００２０】

また、時には、ユーザのグループが共同でコンテクスト情報を入手することが望ましいことがあるが、そのメンバ同士は異なるニーズや好みを持っていることがあるため、それは既存のソリューションを用いた場合、面倒な手順ともなりうる。別の実際的な例において、ユーザのグループが、一緒にレストランを訪れようとして、例えばユーザの位置と好みに基づいて、利用可能なレストランおよびそのメニューについて情報を提供する通信サービスを呼び出してもよい。その場合、グループ内の各ユーザが、そのようなサービスを呼び出すと、通常は、位置と好みの違いに応じて、異なる結果を受け取ることになる。その後、結果を調整してグループ内のすべてのユーザを満足させるレストランについて合意するのは、ユーザに任されるが、それは当然困難かつ時間の無駄となりうる。

【００２１】

結論として、コンテクスト情報を提供する場合にはコンテクストサーバがより柔軟になることが望ましいし、また、グループコンテクストをもっと効率的に取り扱うことも望ましい。さらに、メンバからの最小限の協力を要請するだけでグループに対して注目オブジェクトについての関連するコンテクスト情報を提供するための、有用なソリューションが必要である。

【課題を解決するための手段】

【００２２】

本発明の目的は、上記に概説した諸問題を緩和または除去することである。特に、コンテクスト情報をコンテクストサーバから入手する場合に要求側当事者の特定のニーズや要件を満たすためのソリューションを提供することが、本発明の目的である。

【００２３】

この目的およびその他の目的は、主として、通信ネットワーク内で注目オブジェクトについてのコンテクストを保持するコンテクストサーバからコンテクスト情報を入手する方法および装置を提供することによって達成されるが、前記コンテクストサーバは、注目オブジェクトに関連付けられたセンサから生のコンテクストデータを受け取る。

【００２４】

本発明の方法において、前記注目オブジェクトに関する精緻化されたコンテクスト情報を求める要求を、要求側当事者から受け取る。要求側当事者の少なくとも１つの個別エンティティについて個別のコンテクストデータが収集され、受信された個別のコンテクストデータを基に、カスタマイズされたルールが作成される。ルールは、注目オブジェクトに関する精緻化されたコンテクスト情報を求める適応された要求における条件を定義する。次いで、カスタマイズされたルールを含む適応された要求が、注目オブジェクトのコンテクストサーバへ送られる。最後に、ルールに従って精緻化されたコンテクストデータを、コンテクストサーバから受け取る。

【００２５】

個別のコンテクストデータは、単数または複数の前記個別のエンティティについてのコ

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ンテクストを保持する、少なくとも１つのコンテクストマネジャから収集されることが好ましい。要求側当事者が、複数の個別エンティティのグループである場合、個別のコンテクストデータが個別のエンティティの各々について収集され、受け取った個別のコンテクストデータがグループコンテクストへと集合化され、カスタマイズされたルールがグループコンテクストから作成される。

【００２６】

できれば、個別のコンテクストデータを収集するのにコンテクストテンプレート構造が用いられることが望ましい。テンプレートは、要求側当事者に関連するパラメータ用の所定のデータフィールドを含み、そこには要求側当事者の現在のコンテクストデータが記入される。コンテクストテンプレートは、ＳＩＰ／Ｓｉｍｐｌｅプロトコルを用いてＩＭＳインタフェースによって通信されるＳＤＭドキュメント（文書）として提供されてもよい。コンテクストテンプレートは、要求側当事者を一般的に定義する基本的なデータ用の標準的なフィールドを含む一般テンプレートを、コンテクストパラメータ用のフィールドをさらに含む応用テンプレートへと拡張することによって作成されてもよい。要求側当事者が複数の個別エンティティのグループである場合、一般テンプレートは、グループのアイデンティティ（識別情報）用、グループメンバ用、そして、使用されるならば、任意で、グループ管理者用の、標準的フィールドを含んでもよい。また、応用テンプレートは、個別のエンティティの各々についてのパラメータフィールドを含んでもよい。

【００２７】

本発明の装置は、要求側当事者から、前記注目オブジェクトに関する精緻化されたコンテクスト情報を求める要求を受け取る手段を含む。装置は、さらに、要求側当事者の少なくとも１つの個別エンティティについての個別のコンテクストデータを収集するように構成された、コンテクスト収集ユニットを含む。装置は、さらに、受け取った個別コンテクストデータに基づいてカスタマイズされたルールを作成するように構成された、コンテクスト集合化ユニットを含む。ルールは、注目オブジェクトに関して精緻化されたコンテクスト情報を求める適応された要求において、条件を定義する。装置は、さらに、カスタマイズされたルールを含む適応された要求を注目オブジェクトのコンテクストサーバへ送る手段と、そのルールに従って精緻化されたコンテクストデータをコンテクストサーバから受け取る手段とを含む。

【００２８】

コンテクスト収集ユニットは、さらに、単数または複数の前記個別のエンティティについてのコンテクストを保持する少なくとも１つのコンテクストマネジャから、個別のコンテクストデータを収集するように構成されることが好ましい。要求側当事者が複数の個別のエンティティのグループである場合には、コンテクスト収集ユニットは、さらに、個別エンティティの各々についての個別のコンテクストデータを収集するように構成されることが好ましい。コンテクスト集合化ユニットは、さらに、受信した個別のコンテクストデータをグループコンテクストとして集合化し、また、カスタマイズされたルールをグループコンテクストから作成するように構成されることが好ましい。

【００２９】

コンテクスト収集ユニットは、さらに、個別のコンテクストデータを収集するためにコンテクストテンプレート構造を使用するように構成されてもよい。テンプレートは、要求側当事者の現在のコンテクストデータを記入することになる、要求側当事者に関連するパラメータ用に事前定義されたデータフィールドを含む。コンテクスト収集ユニットは、さらに、コンテクストテンプレートとして、ＳＩＰ／Ｓｉｍｐｌｅプロトコルを用いてＩＭＳインタフェースによって通信されるＸＤＭ文書を使用するように構成されることが好ましい。コンテクスト収集ユニットは、さらに、要求側当事者を一般的に定義する基本的なデータ用の標準的なフィールドを含む一般テンプレートを、コンテクストパラメータ用のフィールドをさらに含む応用テンプレートへと拡張することによって、コンテクストテンプレートを作成するように構成されてもよい。要求側当事者が複数の個別のエンティティのグループである場合、一般テンプレートは、グループのアイデンティティ用、グループ

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メンバ用、そして、使用されるならば、任意で、グループ管理者用の、標準的フィールドを含んでもよい。また、応用テンプレートは、個別のエンティティの各々についてのパラメータフィールドを含んでもよい。

【００３０】

本発明は、さらに、通信ネットワーク内で注目オブジェクトについてのコンテクストを保持するコンテクストサーバからコンテクスト情報を提供する方法を包含するが、コンテクストサーバは、注目オブジェクトに関連付けられたセンサから生のコンテクストデータを受け取る。後者の方法によれば、注目オブジェクトに関して精緻化されたコンテクスト情報を求めて要求側当事者から発せられた、適応された要求が、受信される。適応された要求は、要求側当事者の少なくとも１つの個別のエンティティについての収集された個別のコンテクストデータに基づいて作成された、カスタマイズされたルールを含むが、このルールは、適応された要求の中で条件を定義する。生のコンテクストデータは、受信したカスタマイズされたルールを適用することによって精緻化され、そして、最後に、精緻化されたコンテクスト情報が、要求側当事者に配信されるために提供される。受信したカスタマイズされたルールは、グループメンバの複数の個別コンテクストから集合化されたグループコンテクストから導出済みであることが好ましい。

【００３１】

本発明は、さらに、通信ネットワーク内で注目オブジェクトについてのコンテクストを保持するコンテクストサーバからのコンテクスト情報を提供するための、対応する装置を包含するが、コンテクストサーバは、注目オブジェクトに関連付けられたセンサから生のコンテクストデータを受け取る。後者の装置は、注目オブジェクトに関する精緻化されたコンテクスト情報を求めて要求側当事者から発せられた、適応された要求を受け取る手段を含む。適応された要求は、要求側当事者の少なくとも１つの個別エンティティについて収集された個別のコンテクストデータに基づいて作成された、カスタマイズされたルールを含むが、このルールは、適応された要求の中で条件を定義する。後者の装置は、さらに、受信したカスタマイズされたルールを適用することによって生のコンテクストデータを精緻化する手段と、精緻化されたコンテクスト情報を、前記要求側当事者への配信のために提供する手段とを含む。受信したカスタマイズされたルールは、グループメンバの複数の個別コンテクストから集合化された、グループコンテクストから導出されていてもよい。

【００３２】

好適実施形態についての下記の記述から理解されるであろうが、相互関係のある発明の概念を形成するため、コンテクストサーバからのコンテクスト情報を提供する後者の装置は、コンテクストサーバからのコンテクスト情報を入手する前者の装置と共同で動作してもよい。同じことは、コンテクストサーバからのコンテクスト情報を提供する後者の方法と、コンテクストサーバからのコンテクスト情報を入手する前者の方法とにもあてはまる。本発明のさらなる好適な特徴および利点は、下記の詳細な説明から明らかになるであろう。

【００３３】

ここで、好適な実施形態を用いて、また、添付の図面を参照しながら、本発明についてより詳細に説明しよう。

【発明を実施するための最良の形態】

【００３４】

簡単に言えば、本発明は、要求側当事者の特定のニーズが、それに適応された関連するコンテクスト情報を提供すると、満たされうるような、ソリューションを提供する。このソリューションにおいて、具体的な注目オブジェクトに関する自分自身の要件とニーズとに適応された、精緻化されたコンテクスト情報についての条件を定義する「カスタマイズ」されたルールが、要求側当事者のために作成されてもよい。本明細書内で用いられる場合、「ルール」という用語は、生のコンテクストデータから一定のパラメータを算出し、結論を引き出し、あるいは編集物を作成する、いかなるアルゴリズムもしくはそれに類似

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したものを表してもよい。できれば、精緻化されたコンテクスト情報を求める要求を要求側当事者から受け取った後、カスタマイズされたルールが、その要求に従って、要求側当事者に関連するパラメータについての所定のデータフィールドを含む、コンテクストテンプレートによって定義されることが好ましい。次いで、テンプレートの中の空のパラメータフィールドに、要求側当事者の現在のコンテクストデータが記入されてもよい。

【００３５】

次いで、記入されたテンプレートから作成されたようなカスタマイズされたルールを含む、精緻化されたコンテクスト情報を求める適応された要求が、例えば図２に記述されたもののような、注目オブジェクトのコンテクストサーバに提出される。次いで、コンテクストサーバは、コンテクスト情報を所望の形式で要求側当事者に提供する目的で、受け取った生のコンテクストデータを精緻化するため、新たなルールを適用するであろう。それによって、要求側当事者は、事前定義された固定的なコンテクストの精緻化およびルールに限定されることなく、自分自身のニーズと要件とに合わせられたコンテクスト情報を要求できる。本発明は、要求側当事者が、１人の個人である場合にも、共にグループを構成する複数の個人である場合にも、使用可能であり、それについては以下により詳細に記述する。

【００３６】

ここで、所望のコンテクスト情報をコンテクストサーバから入手するための本発明の手順および装置について、典型的な実施形態を用いて、まず図３を参照しながら、説明しよう。この実施形態において、コンテクストサーバ３００は、基本的に、図２に示す先行技術のコンテクストサーバ２００として構成されており、従って、コンテクストマネジャ３０２と事前定義されたポリシーに基づく承認管理機能３０４とを有している。アドバタイザ機能がここにも同様に含まれてもよいが、この図には示されていない。同様に、コンテクストマネジャ３０２は、注目オブジェクト３０６ａに関連付けられたセンサ３０６から来る生のコンテクストデータを受け取って格納する、コンテクスト格納ユニット３０８を含む。次いで、格納された生データは、基本的に図２について記述したのと同様の方法であらゆる許可された要求側当事者に対して配信器３１４によって提供される精緻化されたコンテクスト情報を生成するため、事前定義されたルール３１２に従ってコンテクスト精緻化器３１０において処理される。

【００３７】

この例では、要求側当事者は、ここではエンティティＡ、Ｂ、Ｃ．．．で示す個人のグループ３１６で構成され、そのメンバ達にとって有効なグループコンテクストは、「集合的コンテクスト機能」３１８によって作成されるが、これは例えばＩＭＳネットワークのようなサービスネットワーク内のサーバもしくはそれに類似したものの中に実装されてもよい。しかし、以下に記述するメカニズムは、単独の要求側エンティティについても同様に用いられてもよい。ここに記述した実施形態において、集合的コンテクスト機能は、一般に、ノードと考えられるであろう。

【００３８】

個人であるＡ、Ｂ、Ｃ．．．は各々、順に、関連付けられたコンテクストマネジャであるCM_A、CM_B、CM_C．．．３２０を有するが、それらは、コンテクストサーバ３０２が注目オブジェクト３０６ａの代わりに行うのと基本的に同じ方法で、その関連付けられた個人の代わりにコンテクストを保持する。例えば、個人であるＡ、Ｂ、Ｃ．．．が移動ユーザである場合、本発明はこの点で限定されはしないが、彼らのコンテクストは、彼らの端末の能力、現在の状況、個人の好み、そして現在位置に関する詳細を含んでもよい。故に、各コンテクストマネジャ３２０は、生のコンテクストデータを、各個人３１６に関連付けられた、図示していない、センサから受け取る。

【００３９】

本ソリューションにおいて、集合的コンテクスト機能３１８は、例えば、グループを形成する際にメンバが合意した少なくともいくつかの点で、グループのすべてのメンバ３１６について集合的に有効な、集合化されたグループコンテクストを作成する。あるいは、

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グループの会員資格がすでに固定（確定）されている既存のグループが、インポートされてもよい。ここで、グループは形成済みであり、集合的コンテクスト機能３１８は、コンテクスト情報を求める要求をグループからすでに受け取っていると仮定するが、それについては、後で、下記に、より詳しく述べられるであろう。第１の図解されたステップ３：１において、集合的コンテクスト機能３１８は、個別のコンテクスト情報をコンテクストマネジャCM_A、CM_B、CM_C．．．３２０の各々から収集する。非常に大きいグループの場合、集合的コンテクスト機能３１８の過負荷を回避する目的で、多くのコンテクストの更新をグループの個々人のコンテクストマネジャ３２０から受け取るのに、（図示されていない）プロキシが用いられてもよい。次いで、プロキシが、グループの関心に対して有意義な変更を含む更新のみを選択して転送し、それによってフィルタとして機能してもよい。従って、プロキシは、例えば、一定の限度を超えたユーザ位置の変更のような、行われた要求にとって「重要な」コンテクストの変更だけを転送するように構成されてもよい。

【００４０】

次いで、集合化されたグループコンテクストが、ステップ３：１で受け取った個別コンテクストに基づいて、できれば上述のようにコンテクストテンプレートを用いることによって、集合的コンテクスト機能３１８において作成されることが好ましいが、これについても後で、下記に、より詳しく述べられるであろう。次いで、対応するカスタマイズされたルールが定義され、精緻化されたコンテクスト情報を求める適応された要求として、次のステップ３：２においてコンテクストサーバ３００へ送られる。従って、このルールは、集合化されたグループコンテクストと、要求側当事者から最初に受け取った要求とを、組み合わせた結果である。従って、カスタマイズされたルールは、事実上、グループメンバのコンテクストによって指示された彼らの要件とニーズとに適応された形式の、精緻化されたコンテクスト情報を求める、コンテクストサーバ３００への要求を表す。

【００４１】

このソリューションがＩＭＳネットワーク内に実装される場合、ルール／テンプレートは、ＩＭＳ環境におけるリスト管理のための専門言語である、ＸＤＭ（ＸＭＬ　Ｄａｔａ　Ｍａｎａｇｅｍｅｎｔ）文書として表されることが好ましい。次いで、他の転送手段も可能ではあるが、ＸＤＭで定義されたルールは、ＩＭＳインタフェースによってＳＩＰ／Ｓｉｍｐｌｅプロトコルを用いて、集合的コンテクスト機能３１８とコンテクストサーバ３００との間で通信される。さらに、集合的コンテクスト機能３１８は、ＩＭＳネットワーク用に定義された、プレゼンスおよびグループ管理サーバ（ＰＧＭ）に実装されてもよい。

【００４２】

別の具体的な例では、カスタマイズされたルールは、移動ユーザのグループからのレストランでの適切な食事についての要求の中での条件として定義されてもよい。次いで、ルールは、すべてのグループメンバの、または少なくともできるだけ多くのグループメンバの好みを、満足させるように定義されるべきであり、また、その個別のコンテクストの集合から導出してもよい。例えば、第１のメンバはピーナツのアレルギがあり、第２のメンバは米を好み、第３のメンバは、スパイスのきいた食物は嫌いかもしれない。そうして作成されたルールは、次の「米を含むがピーナツを含まないスパイスのきいていない食事を何か提案する」という条件付の要求を含んでもよい。コストを制現するパラメータに関するさらなる好みは、メンバＡ：最大２００ＳＥＫ、メンバＢ：最大２５０ＳＥＫ、メンバＣ：最大３００ＳＥＫなどを含んでもよい。集合化されたグループコンテクストにおいて、コストパラメータは、ＡからＣまでのすべてのメンバを満足させる、最大２００ＳＥＫとなるであろう。

【００４３】

ルールの中にレストランの位置についての要件をさらに定義するため、例えば、「ある場所から５００メートル以内に位置していて上記の条件を満たすレストランを提案する」というように、個別のメンバに関する位置情報が用いられてもよい。次いで、利用可能な

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レストランやそのメニューに関する情報を提供するコンテクストサーバを用いてサービスが呼び出されると、作成されたルールが、そこへ提出される。次いで、コンテクストサーバからの応答は、カスタマイズされたルールによって設定された条件を満たす、できればメニューを含む、あらゆるレストランのリストを含むことができる。

【００４４】

上記の複数の例から理解されるべきだが、当業者であれば、要求に関連するパラメータに関して、収集された個別のコンテクストを集合化してグループコンテクストおよびカスタマイズされたルールを作る論理（ロジック）を、作り出せるであろう。

【００４５】

図３に戻るが、作成され、カスタマイズされ、ステップ３：２においてコンテクストサーバ３００へ送られたルールは、要求が現行のポリシーに従って許可されているかどうかを判断するため、承認管理ユニット３０４においてチェックされる。許可されていると仮定すれば、ルール３１２ａの中の条件と要件とに従って精緻化されたコンテクスト情報を作り出すため、ステップ３：３において、新しいルール３１２ａが、コンテクストマネジャ３０２内の既存のルール３１２に追加される。こうしてステップ３：４において、ルール３１２ａがコンテクスト精緻化器３１０に適用され、次いでさらなるステップ３：５において、配信器３１４が、ルール３１２ａに従って準備された精緻化されたコンテクストを、集合的コンテクスト機能３１８への応答として提供する。次いで、最後のステップ３：６において、集合的コンテクスト機能３１８は、情報の結果を個別のエンティティ３１６のいずれに対しても、例えば所定のスキームに従って、最終的に渡すことができる。また、結果は、前記結果を入手するためいかなる個人３１６がアクセスしてもよい、別個のアプリケーションサーバ３２２もしくはそれに類似したものに対して、伝達されてもよい。

【００４６】

図４は、図３のシナリオと同様に、精緻化されたコンテクスト情報をコンテクストサーバから入手する手順と装置とを図解する図であり、集合的コンテクスト機能４００がより詳細に図解されている。図３の場合のように、集合的コンテクスト機能４００は、個別エンティティ４０４のグループに関連付けられたコンテクストマネジャ４０２から個別のコンテクストを収集し、カスタマイズされたルールをコンテクストサーバ４０６へ送る。この実施形態において、集合的コンテクスト機能４００は、以下で説明するように、グループマネジャ４０８と、コンテクスト収集ユニット４１０と、コンテクスト集合化ユニット４１２とを含む。

【００４７】

第１のステップ４：１において、個別エンティティのグループ４０４のうちのエンティティＡが、特定のグループを代表して、注目オブジェクトに関するコンテクスト情報を求める要求を、集合的コンテクスト機能４００へ送る。例えば図２について記述したような公開メカニズムから、何が提供されているかに応じて、あるいはグループが一般に何に注目しているのかに応じて、要求が作成されてよい。上述のように、グループは、新しいものでもよいし、インポートされた既存のものでもよい。個人４０４が移動ユーザである場合、そのうちの１人が主導権を握って、何らかの点で共通の関心を持つグループのための、例えば昼食時に一緒に食事をするための、要求を行ってもよい。あるいは、例えば、個別エンティティ４０４が、通信サービス等を可能にする、相互に関連があるアプリケーション群である場合、それ自体はグループメンバであることが意図されていない別個のサービス管理ユニットまたは管理者が、コンテクスト情報要求を送ってもよい。

【００４８】

いずれにしても、グループを定義し、例えばメンバリストもしくはそれに類似したものを含むデータ構造４０８ａの中にグループを保持する、グループマネジャ４０８が、グループへのコンテクスト情報の要求を受け取る。また、例えば現在の状態や好みなど、グループについてのコンテクストを決定するパラメータであればいかなるパラメータであっても、グループマネジャ４０８の中で定義されてもよい。できれば、コンテクスト情報要求

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に関するパラメータだけが定義されることが、好ましい。一実施形態において、コンテクストテンプレート構造が定義されてもよく、これは、現在のコンテクスト情報が記入されることになるこれらのパラメータについてのフィールドを持つ。それについては、後で、以下に、さらに記述するであろう。

【００４９】

次のステップ４：２において、以下に述べるように、コンテクスト情報要求が、後で使用されることになるコンテクスト集合化ユニット４１２へ伝達される。グループマネジャ４０８によってグループが作成されアクティブにされると、次のステップ４：３において、図３のステップ３：１の場合と同様に、コンテクスト収集ユニット４１０が、現在の個別コンテクストデータを、それらの各々の個人４０４に関連付けられたコンテクストマネジャCM_A、CM_B、CM_C、．．．４０２から、収集する。留意すべきだが、ステップ４：２とステップ４：３の順序は逆であってもよいで。

【００５０】

次いで、ステップ４：４において、収集されたコンテクストがコンテクスト集合化ユニット４１２へ伝達され、次いで、コンテクスト集合化ユニット４１２は、個別のコンテクストを共通のグループコンテクストへと集合化する。ステップ４：２において伝達されたコンテクスト情報要求と組み合わせられることで、グループコンテクストは、コンテクストサーバ４０６からの精緻化されたコンテクスト情報を求める、適応された要求の中での条件へと翻訳されうる。これらの条件は、ユニット４１２が作成した、カスタマイズされたルールとして表現されうる。次いで、次のステップ４：５において、コンテクスト集合化ユニット４１２は、ルール４１４をコンテクストサーバ４０６へ要求として送り、ルールは、こうして要求の条件を定義する。基本的に図３のステップ３：４について記述したように、生のコンテクストデータを精緻化した後、コンテクストサーバ４０６は、提出されたルール４１４に従って精緻化されたコンテクスト情報を、ステップ４：６において、グループマネジャ４０８へ返す。最後に、ステップ４：７において図解するように、グループマネジャ４０８が、情報の結果を、例えば何らかの事前定義スキームに従って、個別エンティティ４０４のうちのいずれかへ、あるいは、アクセス可能なアプリケーションサーバもしくはそれに類似したものへ、送ってもよいが、本発明はこの点で制限されない。

【００５１】

図５は、別の実施形態による、グループについての状態図である。グループは、図４に示すグループマネジャによって保持されることが好ましい。第１の状態５００において、グループが、グループ形成トリガ５：１に応じて作成されるが、トリガは、上述のように、ユーザ、指定されたグループ管理者、もしくはサービスアプリケーションマネジャからの、特定のグループについてのコンテクスト情報要求であってもよい。グループの作成には、そのメンバを指定することと、注目パラメータを定義すること等が含まれる。

【００５２】

グループを作成するプロセスが完了したら、矢印５：２で示すように、グループは、現在の個別のコンテクストデータが受け取られ更新されうる、アクティブ状態５０２に入る。また、例えば、メンバがグループから脱退したりグループに加入したりしてグループについての会員構成が変化した場合、あるいは、例えば好みやポリシーに関してそのメンバもしくはグループ管理者によってグループのプロファイルやパラメータが更新された場合等には、矢印５：３によって示すように、グループパラメータは、グループの存続期間中はいつでも、アクティブ状態において修正されてもよい。

【００５３】

グループは、グループの存続期間中はいつでも、非アクティブ化トリガ５：４に応じて、非アクティブ状態５０４に入ってもよい。非アクティブ状態においては、アクティブ化トリガ５：５によって起こされるまでは、コンテクストデータまたは修正を受け取ることはできないし、グループは休眠状態である。非アクティブ化トリガ５：４は、グループメンバもしくは管理者から来てもよいし、所定の期限の満了、例えばグループの制限された総存続時間またはグループが最後に新しいコンテクストデータもしくは修正を受け取って

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からの時間の満了であってもよい。アクティブ化トリガ５：５は、通常、グループメンバもしくは管理者から来る。また、アクティブ化トリガは、事前定義されたコンテクスト条件の実現、例えば、一定数のグループメンバが所定の半径の中に位置した場合等であってもよい。この条件がグループメンバの一部についてだけ実現する場合、これらのメンバのサブグループが、集合的コンテクスト機能においてアクティブであると定義されてもよい。

【００５４】

最終的にグループは、典型的には、グループはもはや不要であると判断したメンバもしくは管理者からの削除トリガ５：６に応じて、解散されてもよい。次いで、最終であるグループ削除状態５０６に入る。あるいは、削除トリガは、上記の非アクティブ化トリガ５：４と同様の、時間切れパラメータであってもよい。主な違いは、非アクティブ状態５０４からアクティブ状態５０２に入ることはできるが、削除状態５０６からは入れないということである。

【００５５】

ここで、図６を参照して、要求側当事者が１人の個人のみである場合、注目オブジェクトに関する精緻化されたコンテクスト情報がそれに関連付けられたコンテクストサーバからどのように入手されうるかを説明する。集合的コンテクスト機能６００が、基本的に図４の機能４００と同じコンポーネント、すなわち、グループマネジャ６０２、コンテクスト収集ユニット６０４、そしてコンテクスト集合化ユニット６０６を含むことを示す。

【００５６】

注目オブジェクトに関して精緻化されたコンテクスト情報を求める要求が、第１のステップ６：１において、１人の個人Ａ（６０８）から受け取られる。この場合にも、コンテクスト情報要求は、図示されない別個のサービス管理ユニットもしくは管理者から受け取られてもよい。１人の個人６０８についてはグループが作成されたり保持されたりすることはないため、グループマネジャ６０２は無視されてもよく、要求は、コンテクスト収集ユニット６０４に直接伝達されてもよい。それに応じて、コンテクスト収集ユニット６０４は、ステップ６：２によって図解されるように、個人６０８に関連付けられたコンテクストマネジャCM_A ６１０から個別コンテクストデータを収集する。

【００５７】

また、コンテクスト情報要求に関連するパラメータも、コンテクスト収集ユニット６０４によって定義されるが、できればステップ６：２で収集されたコンテクストデータを記入したパラメータフィールドを備えたコンテクストテンプレート構造を用いて定義されることが好ましい。典型的なコンテクストテンプレート構造については、以下でより詳細に記述されるであろう。

【００５８】

次のステップ６：３において、収集されたコンテクスト情報は、コンテクスト集合化ユニット６０６へ伝達されるが、できればステップ６：１で受信したコンテクスト情報要求と一緒に、記入済みテンプレートとして提供されることが好ましい。ここでユニット６０６は、受け取った個別コンテクストとコンテクスト情報要求とを集合化することによってルール６１２を作成し、ルール６１２は、コンテクストサーバ６１４からのコンテクスト情報を求める適応された要求として、集合化の結果として得られた条件を含む。次いで、コンテクスト集合化ユニット６０６は、次のステップ６：４において、コンテクストサーバ６１４への要求としてルール６１２を送り、このルールが、このようにして要求の条件を定義する。

【００５９】

受け取ったルール６１２に従って生のコンテクストデータを精緻化した後、ステップ６：５において、コンテクストサーバ６１４は精緻化されたコンテクスト情報をコンテクスト収集ユニット６０４に返す。留意されるべきだが、グループマネジャ６０２は、上記の図４の例と比べて、今度も前と同じように無視されてもよく、また、基本的にグループマネジャ６０２はプロセス全体を通じて透過的である。最後に図解されたステップ６：６に

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おいて、コンテクスト収集ユニット６０４は、情報の結果を個人６０８に、またはアクセス可能なアプリケーションサーバもしくはそれに類似したものに送ることができる。

【００６０】

上述のように、コンテクストテンプレート構造は、受け取ったコンテクスト情報要求に関連するパラメータについてのフィールドで定義されることが好ましい。従って、これらのパラメータフィールドは、作成されたグループのメンバの現在の個別のコンテクストを、あるいは適用可能なら１人の個人のコンテクストを、収集して登録するのに用いることができる。次いでパラメータフィールドに、収集された各コンテクストからの対応するデータが記入される。図７ａおよび図７ｂは、好適実施形態に従ってここではＸＭＬを用いたＸＤＭ文書として示す、一般テンプレート構造と応用テンプレート構造とをそれぞれ図解する。

【００６１】

「一般テンプレート」のデータ構造は、要求側当事者を一般的に定義する基本データについての標準的なフィールドを含む。図７ａに示す一般テンプレート７００は、グループ識別情報（ＩＤ）、グループメンバ（ここではメンバＡ、Ｂ、およびＣとして示す）、そしてもし使われるなら、任意でグループ管理者についてのそのような標準的なフィールドを含む。メンバ及び管理者のためのフィールドは、できれば通信用の適切なＩＤとネットワークアドレスとを収容するべきである。

【００６２】

カスタマイズされたルールが要求側当事者のために作成されることになる場合、上記のようにコンテクストサーバからの精緻化されたコンテクスト情報を入手するために、コンテクスト情報要求に関連するパラメータが定義されることになる。これは、要求に用いられるアプリケーションのためのアプリケーション固有部分７０４を追加することによって、一般テンプレート７００を拡張して図７ｂに示す「応用テンプレート」になるようにすることによって行うことができる。部分７０４は、アプリケーションの名前と、そのアプリケーションと要求とに関する１つ以上の定義済コンテクストパラメータ１、２、３、．．．のためのフィールド７０６とを含む。こうして、応用テンプレート７０２において、空のパラメータフィールド７０６に、コンテクスト収集プロセスの間に各メンバについて収集されたコンテクスト情報が、例えば図４のステップ４：３または図６のステップ６：２で記述されたように、記入されうる。

【００６３】

図８は、図４において４００と表示されたものと同様の、グループマネジャ８０２とコンテクスト収集ユニット８０４とコンテクスト集合化ユニット８０６とを含む集合的コンテクスト機能８００において、そのようなテンプレート構造がどのように使用されうるかについての一例を図解する。第１のステップ８：１において、グループマネジャ８０２は、コンテクスト情報要求を、この場合、複数の個人Ａ、Ｂ、Ｃ、．．．のグループである要求側当事者８０８から受け取るが、そのうちＡが要求を行う。コンテクスト情報要求に関連するパラメータを定義した後、グループマネジャ８０２は、図７ａに示す一般テンプレートを、最初は図示するように空である、各グループメンバの分の定義済パラメータのフィールドを含む応用テンプレート構造８１２を作成するための開始点として採用する。

【００６４】

次いで、ステップ８：２において、応用テンプレート８１２が、コンテクスト収集ユニット８０４へ伝達される。さらに、ステップ８：１で受け取られたコンテクスト情報要求も、ステップ８：３において、コンテクスト集合化ユニット８０６へ伝達される。そこでコンテクスト収集ユニット８０４は、次のステップ８：４において、グループメンバに関連付けられたコンテクストマネジャ８１０から個別のコンテクストを収集する。これを行う際に、応用テンプレートのパラメータフィールドに、各グループメンバについて収集されたコンテクストを記入する。留意されるべきだが、一部の個別エンティティについて、パラメータのすべてが入手可能とはいかないということが起こりうるので、一部のフィールドが情報に関して空のままの場合もある。さらに、一部のパラメータを「必須」、他の

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パラメータを「任意」として定義することも可能である。いずれかのエンティティが必須パラメータについてのコンテクスト情報を提供できない場合、結果としての動作は、状況および用いられるアプリケーションのうちの少なくとも一方に応じて決まってもよい。コンテクスト収集プロセスが完了すると、記入されたテンプレート８１４は、次のステップ８：５において、コンテクスト集合化ユニット８０６へ伝達される。

【００６５】

最後のステップ８：６において、ユニット８０６は、ステップ８：５で受け取ったテンプレート８１４の中のコンテクスト情報とステップ８：３で受け取った要求とに基づいて、カスタマイズされたルール８１６を作成する。次いで、ルール８１６は、基本的に図３について記述された方法で、精緻化されたコンテクスト情報をそこから入手するため、コンテクストサーバへ提出される。

【００６６】

本発明の一態様によって、通信ネットワーク内の注目オブジェクト、例えば３０６ａについてのコンテクストを保持するコンテクストサーバ、例えば３００、４０６、もしくは６１４からコンテクスト情報を入手する方法が提供される。図３、４、６、および８について記述した集合的コンテクストサーバによって行われるこの手順の概略を、これから図９に示すフローチャートを参照しながら説明しよう。コンテクストサーバは、生のコンテクストデータを、注目オブジェクトに関連付けられたセンサ、例えば３０６から、受け取ると仮定する。

【００６７】

第１のステップ９００において、注目オブジェクトに関する精緻化されたコンテクスト情報を求める要求が、１人の個人と複数の個人のグループとのうちいずれか一方に相当する要求側当事者から、受け取られる。

【００６８】

次のステップ９０２において、要求側当事者の少なくとも１つの個別エンティティについて、個別のコンテクストデータが、好ましくは、１人の個人の１台のコンテンツサーバとグループの複数の個人の複数のコンテンツサーバとのうちの一方から、収集される。できれば、要求に従って要求側当事者に関連するパラメータ用に事前定義されたデータフィールドを含む、コンテクストテンプレート構造が使われることが、好ましい。次いで、パラメータフィールドに、要求側当事者の現在のコンテクストデータが、各個人について記入される。

【００６９】

次のステップ９０４において、収集された個別コンテクストデータに基づいて、かつ、ステップ９００で受け取った要求に関連して、カスタマイズされたルールが作成される。上述のように、記入されたテンプレートを用いて、カスタマイズされたルールが作成されてもよい。

【００７０】

次のステップ９０６において、カスタマイズされたルールを含む、注目オブジェクトに関する精緻化されたコンテクスト情報を求める適応された要求が、注目オブジェクトについてのコンテクストを保持するコンテクストサーバへ送られる。

【００７１】

最後のステップ９０８において、前記ルールに従って精緻化されたコンテクストデータが、コンテクストサーバから受け取られ、これが要求側当事者へ配信されることになる。

【００７２】

本発明の別の態様によれば、通信ネットワーク内の注目オブジェクト、例えば３０６ａについてのコンテクストを保持するコンテクストサーバからコンテクスト情報を提供する方法が、提供される。コンテクストサーバ、例えば図３、４、そして６についてそれぞれ記述した３００、４０６、もしくは６１４によって行われるこの手順の概略を、これから図１０に示す第２のフローチャートを参照しながら説明する。コンテクストサーバは、注目オブジェクトに関連付けられたセンサ、例えば３０６から、生のコンテクストデータを

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受け取る。

【００７３】

第１のステップ１０００において、注目オブジェクトに関する精緻化されたコンテクスト情報を求める適応された要求が受け取られるが、その要求は、要求側当事者から発せられる。適応された要求は、前記要求側当事者の少なくとも１つの個別エンティティ（３１６、４０４）について収集された個別コンテクストデータに基づいて作成された、カスタマイズされたルール（３１２ａ、４１４）を含むが、そのルールは、適応された要求の中の条件を定義する。

【００７４】

次のステップ１００２において、受け取られた生のコンテクストデータが、受け取られたカスタマイズされたルールを適用することによって、精緻化される。

【００７５】

最後のステップ１００４において、精緻化されたコンテクスト情報が、前記要求側当事者への配信のために、提供される。上述の実施形態によれば、精緻化されたコンテクスト情報は、集合的コンテクスト機能へ送られ、次いで、集合的コンテクスト機能が、精緻化されたコンテクスト情報を、要求側当事者、例えば、１人以上の個人または別個のアクセス可能なアプリケーションサーバへ配信する。

【００７６】

留意されるべきだが、上述のメカニズムは、応用分野およびその他の因子に応じて、本発明の範囲内で異なる方法で構成されてもよい。別の具体的な例において、要求側当事者は、ＰｏＣ（プッシュ・トゥ・トーク・オーバー・セルラ）として知られる通信サービスを起動することを望んでいる移動ユーザのグループであってもよい。ＰｏＣにおいては、通話する目的でチャネルをオープンするためボタンを押すことによって、複数のユーザが集団で通信できる。この場合、注目オブジェクトは、ＰｏＣ通信を可能にするネットワークリソースを含む。ネットワークリソースは、通常、ネットワーク運用事業者によって所有および／または管理されるが、ネットワーク運用事業者は、また、承認管理のポリシーも含めて、関連付けられたコンテクストサーバを管理する。リソースの使用形態を最適化するため、グループ内でユーザが利用可能な能力は、サービスを呼び出す前に判断されるべきである。次いで、下記の手順Ａ）からＧ）までが、例えば、図３もしくは図４に示す構成を用いて、実行されうる。

【００７７】

Ａ）例えばグループマネジャ４０８において、グループが作成されるか、または、グループコンテクスト機能にインポートされる。

【００７８】

Ｂ）例えばコンテクスト集合化ユニット４１２において、個別コンテクストを集合化することによって、グループコンテクストが作成される。そのサービスにリソースが必要な場合、サービスに関連付けられた特定のグループアプリケーションを求める要求が、コンテクストを収集し、カスタマイズされたルールを作成する手順を呼び出す。

【００７９】

Ｃ）サービス用として認められた通信リソースと、サービスを利用するユーザの能力とを確認するため、カスタマイズされたルールが作成される。従って、ルールの中の条件が、ユーザの状況を反映する。

【００８０】

Ｄ）カスタマイズされたルールが、ネットワークリソースについてのコンテクストを保持するコンテクストサーバへ送られる。

【００８１】

Ｅ）カスタマイズされたルールが、承認管理ポリシー、例えば承認管理３０４によって一旦検証されたならば、コンテクストサーバ、例えばサーバ３００もしくは４０６において、カスタマイズされたルールが処理される。ルールは、生のコンテクストデータ、この場合ネットワーク情報、を精緻化するために適用され、ユーザが確保することを許可され

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るリソースを判断する。

【００８２】

Ｆ）精緻化されたコンテクストを含んだ応答が、コンテクストサーバから、例えば配信器３１４によって、集合的コンテクスト機能へと送られ、さらにグループメンバへ配信される。これは、ネットワークリソースを配分するための既知のネットワークエンティティである、サービスポリシー決定ポイント（ＰＤＰ）のためのリソース確保ルールとして表されてもよい。

【００８３】

Ｇ）最終的にユーザがサービスを呼び出すと、ユーザは所与のサービスについてリソース確保ルールをＰＤＰへ送ることができる。

【００８４】

結論として、本発明は、注目オブジェクトに関するコンテクスト情報をコンテクストサーバから一般的に入手する際に、要求側当事者の特定のニーズや要件を満たすためのソリューションを提供する。さらに、グループコンテクストを効率的に取り扱うためのメカニズムが提供され、グループの集合的なニーズや要件に関連する、関連のコンテクスト情報が入手可能である。

【００８５】

本発明について、特定の典型的な実施形態を参照しながら記述してきたが、この説明は一般に、本発明の概念を例証することだけを意図しており、本発明の範囲を限定するものと考えられるべきではない。本発明の範囲は、添付の請求項によって規定される。

【図面の簡単な説明】

【００８６】

【図１】先行技術による、マルチメディア通信用の基本的なネットワーク構成を示す図である。

【図２】先行技術による、精緻化されたコンテクスト情報を一般的に要求側当事者に提供するコンテクストサーバのブロック図である。

【図３】一実施形態による、精緻化されたコンテクスト情報が個人のグループについてコンテクストサーバから入手される、通信シナリオのブロック図である。

【図４】別の実施形態による、精緻化されたコンテクスト情報が個人のグループについてコンテクストサーバから入手される、通信シナリオのブロック図である。

【図５】さらに別の実施形態による、前記グループについての精緻化されたコンテクスト情報を入手する際にグループマネジャによって処理される、個人のグループについての状態図である。

【図６】さらに別の実施形態による、精緻化されたコンテクスト情報が１人のみの個人のためにコンテクストサーバから入手される、通信シナリオのブロック図である。

【図７ａ】さらに別の実施形態による、精緻化されたコンテクスト情報を入手するためのカスタマイズされたルールを作成するために使用可能な、一般テンプレートを図解する図である。

【図７ｂ】さらに別の実施形態による、精緻化されたコンテクスト情報を入手するためのカスタマイズされたルールを作成するために使用可能な、応用テンプレートを図解する図である。

【図８】さらに別の実施形態による、テンプレートが集合的コンテクスト機能の中でどのように処理されるかを図解する図である。

【図９】集合的コンテクスト機能によって実行される、注目オブジェクトについてのコンテクストを保持するコンテクストサーバから所望のコンテクスト情報を入手する手順を図解するフローチャートである。

【図１０】注目オブジェクトについてのコンテクストを保持するコンテクストサーバによって実行される、所望のコンテクスト情報を提供する手順を図解するフローチャートである。

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【図１】

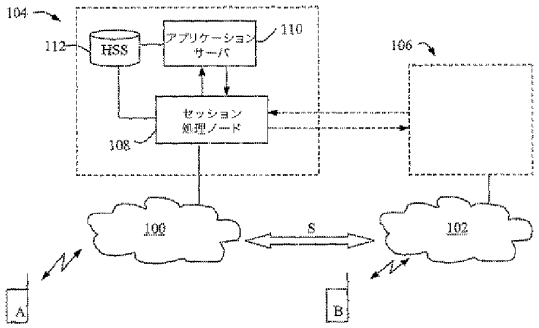


Fig. 1

【図２】

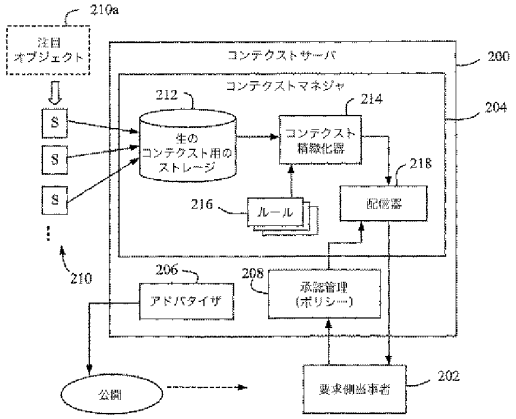


Fig. 2

【図３】

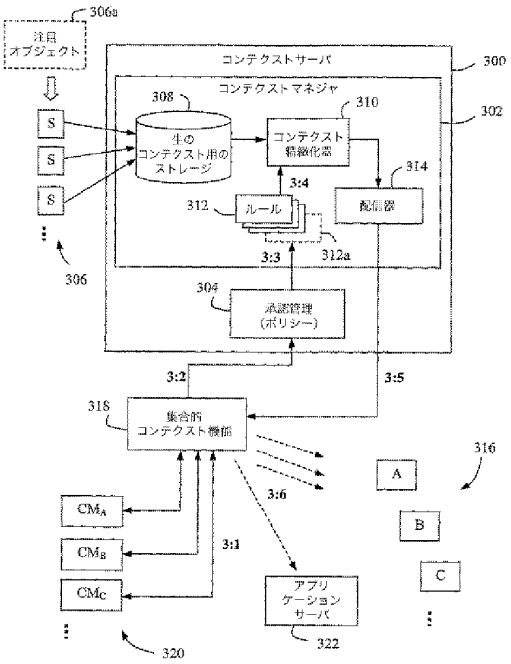


Fig. 3

【図４】

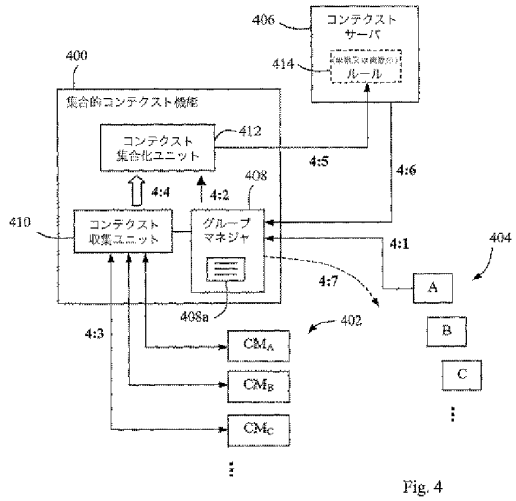


Fig. 4

【図５】

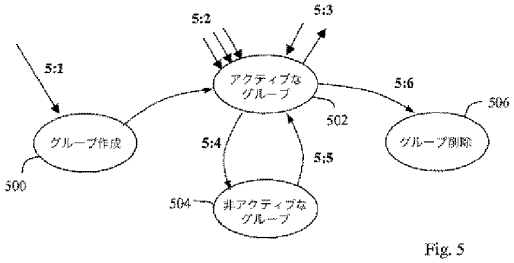


Fig. 5

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【図６】

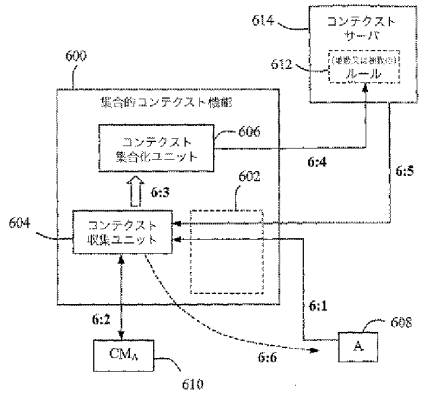


Fig. 6

【図７ａ】

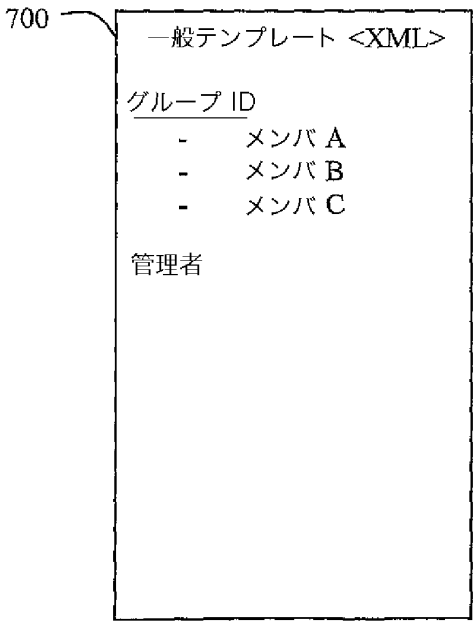


Fig. 7a

【図７ｂ】

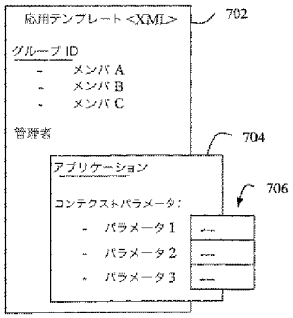


Fig. 7b

【図８】

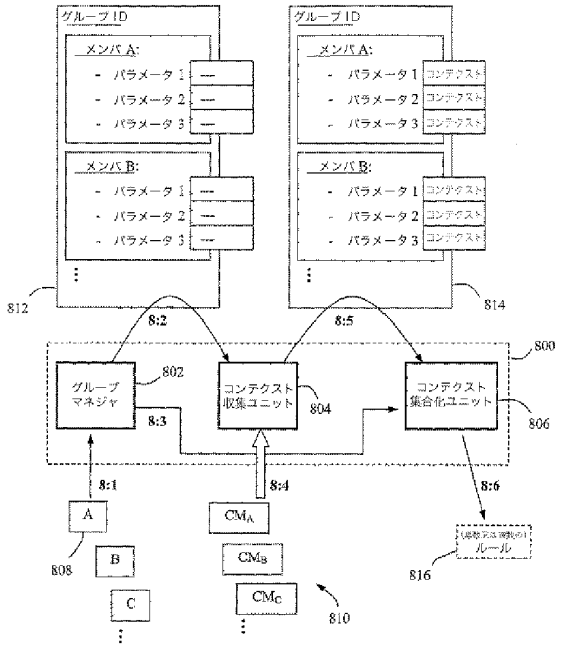


Fig. 8

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【図９】

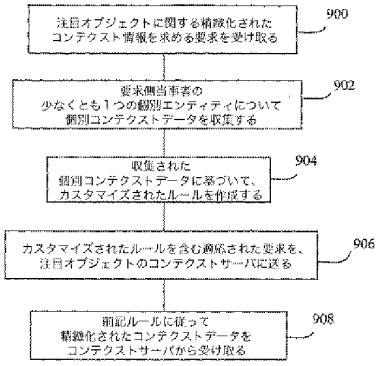


Fig. 9

【図１０】

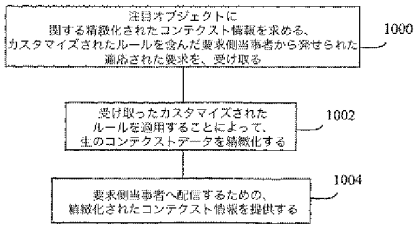


Fig. 10

【手続補正書】
【提出日】平成19年2月22日(2007.2.22)
【手続補正１】
【補正対象書類名】特許請求の範囲
【補正対象項目名】全文
【補正方法】変更
【補正の内容】
【特許請求の範囲】
【請求項１】
通信ネットワークにおいて、注目オブジェクト（３０６ａ）に関するコンテクストを保持するコンテクストサーバ（３００，４０６，６１４）からコンテクスト情報を取得する方法であって、前記コンテクストサーバは、前記注目オブジェクトに関連付けられたセンサ（３０６）から生のコンテクストデータを受信し、コンテクスト精緻化器において、前記生のコンテクストデータから精緻化されたコンテクスト情報を、導出または算出するために、事前定義されたルールに従って前記生のコンテクストデータを処理し、当該方法は、
前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求める要求を、要求側当事者から受信するステップと、
前記要求側当事者のうちの少なくとも１つの個別エンティティ（３１６，４０４）に関する個別コンテクストデータを収集するステップと、
前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求めるために適応された要求における条件を定義する、カスタマイズされたルールを、前記収集された個別コンテクストデータと前記受信されたコンテクスト情報の要求とを集合化することによって前記受信された個別コンテクストデータに基づいて作成するステップと、
前記カスタマイズされたルールを含む前記適応された要求を、前記注目オブジェクトの

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前記コンテクストサーバへ送信するステップと、
を備え、前記コンテクストサーバは、精緻化されたコンテクスト情報を、前記カスタマイズされたルールに従って前記生のコンテクストデータから生成し、
当該方法は、
前記カスタマイズされたルールに従って精緻化されたコンテクスト情報を前記コンテクストサーバから受信するステップ
を更に備えることを特徴とする方法。
【請求項２】
前記個別コンテクストデータは、単数又は複数の前記個別エンティティに関するコンテクストを保持する少なくとも１つのコンテクストマネジャから収集されることを特徴とする請求項１に記載の方法。
【請求項３】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記個別コンテクストデータは、各々の前記個別エンティティから収集され、
前記受信された個別コンテクストデータは、グループコンテクストとして集合化され、
前記カスタマイズされたルールは、前記グループコンテクストから作成される
ことを特徴とする請求項１又は２に記載の方法。
【請求項４】
前記個別コンテクストデータを収集するためにコンテクストテンプレート構造が使用され、
前記コンテクストテンプレート構造は、前記要求側当事者の現在のコンテクストデータによって記入される、前記要求側当事者に関連するパラメータのための事前定義されたデータフィールドを含む
ことを特徴とする請求項１乃至３のいずれか１項に記載の方法。
【請求項５】
前記コンテクストテンプレート構造は、ＩＭＳインタフェースによってＳＩＰ／Ｓｉｍｐｌｅプロトコルを使用して通信される、ＸＤＭドキュメントとして提供されることを特徴とする請求項４に記載の方法。
【請求項６】
前記コンテクストテンプレート構造は、要求側当事者を一般的に定義する基本データのための標準フィールドを含む一般テンプレートを、前記コンテクストパラメータのためのフィールドを更に含む応用テンプレートへと拡張することによって生成されることを特徴とする請求項４又は５に記載の方法。
【請求項７】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記一般テンプレートは、グループ識別情報、グループメンバ、および使用されるのであれば任意でグループ管理者、のための標準フィールドを含む
ことを特徴とする請求項６に記載の方法。
【請求項８】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記応用テンプレートは、各々の前記個別エンティティのためのパラメータフィールドを含む
ことを特徴とする請求項６又は７に記載の方法。
【請求項９】
通信ネットワークにおいて、注目オブジェクト（３０６ａ）に関するコンテクストを保持するコンテクストサーバ（３００，４０６，６１４）からコンテクスト情報を取得する装置であって、前記コンテクストサーバは、前記注目オブジェクトに関連付けられたセンサ（３０６）から生のコンテクストデータを受信し、コンテクスト精緻化器において、前記生のコンテクストデータから精緻化されたコンテクスト情報を、導出または算出するために、事前定義されたルールに従って前記生のコンテクストデータを処理し、当該装置は

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、
前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求める要求を、要求側当事者から受信する手段と、
前記要求側当事者のうちの少なくとも１つの個別エンティティ（３１６，４０４）に関する個別コンテクストデータを収集するコンテクスト収集ユニット（４１０，６０４）と、
前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求めるために適応された要求における条件を定義する、カスタマイズされたルールを、前記収集された個別コンテクストデータと前記受信されたコンテクスト情報の要求とを集合化することによって前記受信された個別コンテクストデータに基づいて作成するコンテクスト集合化ユニット（４１２，６０６）と、
前記カスタマイズされたルールを含む前記適応された要求を、前記注目オブジェクトの前記コンテクストサーバへ送信する手段と、
を備え、前記コンテクストサーバは、精緻化されたコンテクスト情報を、前記カスタマイズされたルールに従って前記生のコンテクストデータから生成し、
前記カスタマイズされたルールに従って精緻化されたコンテクスト情報を前記コンテクストサーバから受信する手段
を更に備えることを特徴とする装置。
【請求項１０】
前記コンテクスト収集ユニットは、単数又は複数の前記個別エンティティに関するコンテクストを保持する少なくとも１つのコンテクストマネジャから前記個別コンテクストデータを収集するように更に適合されることを特徴とする請求項９に記載の装置。
【請求項１１】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記コンテクスト収集ユニットは、各々の前記個別エンティティから前記個別コンテクストデータを収集するように更に適合され、
前記コンテクスト集合化ユニットは、前記受信された個別コンテクストデータをグループコンテクストとして集合化し、前記グループコンテクストから前記カスタマイズされたルールを作成するように更に適合される
ことを特徴とする請求項９又は１０に記載の装置。
【請求項１２】
前記コンテクスト収集ユニットは、前記個別コンテクストデータを収集するためにコンテクストテンプレート構造を使用するように更に適合され、
前記コンテクストテンプレート構造は、前記要求側当事者の現在のコンテクストデータによって記入される、前記要求側当事者に関連するパラメータのための事前定義されたデータフィールドを含む
ことを特徴とする請求項９乃至１１のいずれか１項に記載の装置。
【請求項１３】
前記コンテクスト収集ユニットは、前記コンテクストテンプレート構造として、ＩＭＳインタフェースによってＳＩＰ／Ｓｉｍｐｌｅプロトコルを使用して通信されるＸＤＭドキュメントを使用するように更に適合されることを特徴とする請求項１２に記載の装置。
【請求項１４】
前記コンテクスト収集ユニットは、要求側当事者を一般的に定義する基本データのための標準フィールドを含む一般テンプレートを、前記コンテクストパラメータのためのフィールドを更に含む応用テンプレートへと拡張することによって、前記コンテクストテンプレート構造を作成するように更に適合されることを特徴とする請求項１２又は１３に記載の装置。
【請求項１５】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記一般テンプレートは、グループ識別情報、グループメンバ、および使用されるので

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あれば任意でグループ管理者、のための標準フィールドを含む
ことを特徴とする請求項１４に記載の装置。
【請求項１６】
前記要求側当事者は、複数の個別エンティティのグループであり、
前記応用テンプレートは、各々の前記個別エンティティのためのパラメータフィールドを含む
ことを特徴とする請求項１４又は１５に記載の装置。
【請求項１７】
通信ネットワークにおいて、注目オブジェクトに関するコンテクストを保持するコンテクストサーバ（３００，４０６，６１４）からコンテクスト情報を提供する方法であって、前記コンテクストサーバは、前記注目オブジェクトに関連付けられたセンサ（３０６）から生のコンテクストデータを受信し、コンテクスト精緻化器において、前記生のコンテクストデータから精緻化されたコンテクスト情報を、導出または算出するために、事前定義されたルールに従って前記生のコンテクストデータを処理し、当該方法は、
要求側当事者から発生した、前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求めるために適応された要求であって、前記要求側当事者のうちの少なくとも１つの個別エンティティ（３１６，４０４）に関して収集された個別コンテクストデータに基づいて、前記収集された個別コンテクストデータと前記受信されたコンテクスト情報の要求とを集合化することによって作成された、当該適応された要求における条件を定義するカスタマイズされたルール（３１２ａ，４１４）を含む要求を受信するステップと、
前記受信されたカスタマイズされたルールに従って、精緻化されたコンテクスト情報を前記生のコンテクストデータから生成するステップと、
前記要求側当事者への配信のために、前記カスタマイズされたルールに従って精緻化されたコンテクスト情報を提供するステップと、
を備えることを特徴とする方法。
【請求項１８】
前記受信されたカスタマイズされたルールは、グループメンバの複数の個別コンテクストから集合化されたグループコンテクストから導出されることを特徴とする請求項１７に記載の方法。
【請求項１９】
通信ネットワークにおいて、注目オブジェクトに関するコンテクストを保持するコンテクストサーバ（３００，４０６，６１４）からコンテクスト情報を提供する装置であって、前記コンテクストサーバは、前記注目オブジェクトに関連付けられたセンサ（３０６）から生のコンテクストデータを受信し、コンテクスト精緻化器において、前記生のコンテクストデータから精緻化されたコンテクスト情報を、導出または算出するために、事前定義されたルールに従って前記生のコンテクストデータを処理し、当該装置は、
要求側当事者から発生した、前記注目オブジェクトに関連する精緻化されたコンテクスト情報を求めるために適応された要求であって、前記要求側当事者のうちの少なくとも１つの個別エンティティ（３１６，４０４）に関して収集された個別コンテクストデータに基づいて、前記収集された個別コンテクストデータと前記受信されたコンテクスト情報の要求とを集合化することによって作成された、当該適応された要求における条件を定義するカスタマイズされたルール（３１２ａ，４１４）を含む要求を受信する手段と、
前記受信されたカスタマイズされたルールに従って、精緻化されたコンテクスト情報を前記生のコンテクストデータから生成する手段と、
前記要求側当事者への配信のために、前記カスタマイズされたルールに従って精緻化されたコンテクスト情報を提供する手段と、
を備えることを特徴とする装置。
【請求項２０】
前記受信されたカスタマイズされたルールは、グループメンバの複数の個別コンテクストから集合化されたグループコンテクストから導出されることを特徴とする請求項１９に

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記載の装置。

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【国際調査報告】

INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
H04L29/08

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)
H04L

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2004/122977 A1 (MORAN TIMOTHY L ET AL) 24 June 2004 (2004-06-24) abstract paragraph '0029! - paragraph '0045! paragraph '0057! - paragraph '0076!	1,2,9, 10,17,19 3-8, 11-16, 18,20
Y	WO 01/45342 A (NORTEL NETWORKS LIMITED; DAVIES, ELWYN, B) 21 June 2001 (2001-06-21) abstract page 14, line 9 - page 18, line 23 page 21, line 18 - page 24, line 18	3,11,18, 20
	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

* Special categories of cited documents :

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"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)

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"P" document published prior to the international filing date but later than the priority date claimed

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Date of the actual completion of the international search	Date of mailing of the international search report
12 January 2006	19/01/2006

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax (+31-70) 340-3016	Peeters, D

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/SE2005/001461

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/018692 A1 (EBLING MARIA RENE ET AL) 23 January 2003 (2003-01-23) abstract paragraph '0024! - paragraph '0042!	4-8, 12-16
A	US 2004/122896 A1 (GOURRAUD CHRISTOPHE) 24 June 2004 (2004-06-24) abstract paragraph '0001! - paragraph '0012! paragraph '0059! - paragraph '0062!	3,11,18, 20

Form PCT/ISA/210 (continuation of second sheet) (January 2004)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/SE2005/001461

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		EP 1576789 A1	21-09-2005

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(81)指定国 AP(BW,GH,GM,KE,LS,MW,MZ,NA,SD,SL,SZ,TZ,UG,ZM,ZW),EA(AM,AZ,BY,KG,KZ,MD,RU,TJ,TM),EP(AT,BE,BG,CH,CY,CZ,DE,DK,EE,ES,FI,FR,GB,GR,HU,IE,IS,IT,LT,LU,LV,MC,NL,PL,PT,RO,SE,SI,SK,TR),OA(BF,BJ,CF,CG,CI,CM,GA,GN,GQ,GW,ML,MR,NE,SN,TD,TG),AE,AG,AL,AM,AT,AU,AZ,BA,BB,BG,BR,BW,BY,BZ,CA,CH,CN,CO,CR,CU,CZ,DE,DK,DM,DZ,EC,EE,EG,ES,FI,GB,GD,GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KM,KP,KR,KZ,LC,LK,LR,LS,LT,LU,LV,LY,MA,MD,MG,MK,MN,MW,MX,MZ,NA,NG,NI,NO,NZ,OM,PG,PH,PL,PT,RO,RU,SC,SD,SE,SG,SK,SL,SM,SY,TJ,TM,TN,TR,TT,TZ,UA,UG,US,UZ,VC,VN,YU,ZA,ZM,ZW

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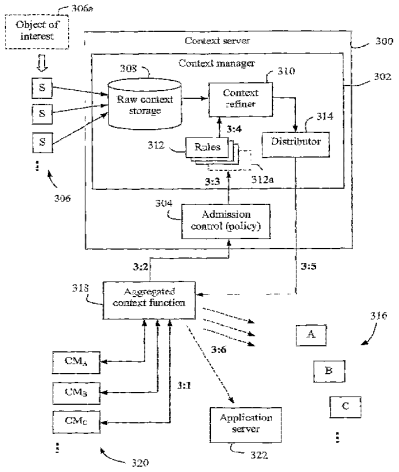
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(54) Title: A METHOD AND ARRANGEMENT FOR PROVIDING CONTEXT INFORMATION



(57) Abstract: A method and apparatus for obtaining context information from a context server (318) maintaining a context for an object of interest (306a) in a telecommunication network. The context server receives raw context data from sensors (306) associated with the object of interest. A request is received from a requesting party for refined context information with reference to the object of interest. Individual context data is collected for at least one individual entity (316) of the requesting party. A customized rule is created on the basis of the received individual context data. The rule defines conditions in an adapted request for refined context information regarding the object of interest, which is sent, including the customized rule, to the context server of the object of interest. Context data refined according to the customized rule is then received from the context server.

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A METHOD AND ARRANGEMENT FOR PROVIDING CONTEXT INFORMATION.

TECHNICAL FIELD

The present invention relates generally to a method and arrangement for providing or obtaining requested context information in a telecommunication network. In particular, the invention is concerned with providing or obtaining context information according to specifications from the requesting party.

BACKGROUND OF THE INVENTION AND PRIOR ART

With the advent of 3G mobile telephony, new packet-based communication technologies have been developed for communicating multimedia content. For example, GPRS (General Packet Radio Service) and WCDMA (Wideband Code Division Multiple Access) technologies support wireless multimedia telephony services involving packet-switched communication of data representing images, text, documents, animations, audio files, video clips, etc., in addition to traditional circuit-switched voice calls. Further, new sophisticated mobile terminals are also emerging on the market, equipped with functionalities to handle the new services, including high resolution colour displays and multiple codecs (coders/decoders) for the different formats. These terminals are also typically capable of different access technologies, depending on network configuration and cell characteristics.

Recently, a service network architecture called "IP Multimedia Subsystem" (IMS) has been developed by the 3rd Generation Partnership Project (3GPP) as an open standard, to provide multimedia services for mobile clients in the packet domain. Generally, IMS is a platform for enabling services based on IP transport, more or less independent of

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the access technology used and basically not restricted to any limited set of specific services.

A specification for session setup has been defined called "SIP" (Session Initiation Protocol, according to the standard IETF RFC 3261 et al), which is an application-layer signalling protocol for controlling (e.g. creating, modifying and terminating) sessions over a packet-switched logic. SIP is generally used by IMS networks for handling multimedia sessions. Also, extensions of the basic SIP protocol may be used, referred to as "Simple", to handle some services.

Fig. 1 illustrates schematically a greatly simplified basic communication scenario for providing multimedia services by means of an IMS service network. It should be noted that the figure only shows a selection of network elements helpful to understand the background technology for the present invention. Briefly described, a calling mobile terminal A is connected to a first radio access network 100 and communicates with a called mobile terminal B connected to a second radio access network 102, in a communication session S involving one or more multimedia services. Alternatively, terminal A may communicate with a fixed terminal or computer, or with a content server delivering some multimedia content to the terminal, such as a piece of music, a film or a game. The terminals A, B may also communicate with servers in the IMS network providing information services, to be described below.

An IMS network 104 is shown connected to the first radio access network 100 and handles the multimedia session S with respect to terminal A. Thus, the IMS network 104 receives and processes any service requests from terminal A.

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Similarly, a corresponding IMS network 106 handles the session S on behalf of terminal B, and the two IMS networks 104 and 106 may be controlled by different operators. Alternatively, terminals A and B may of course be connected to the same access network and/or may be served by the same IMS network.

The illustrated session S is controlled, using SIP signalling, by various suitable session managing nodes, generally indicated by a block 108. Typically, the session managing node types include S-CSCF (Serving Call Session Control Function), I-CSCF (Interrogating Call Session Control Function) and P-CSCF (Proxy Call Session Control Function). Invoked multimedia services are enabled and executed by a plurality of application servers 110. Further, a main database element HSS (Home Subscriber Server) 112 stores subscriber and authentication data as well as service information, among other things, that the application servers 110 can fetch for executing services for clients. The various functions of the IMS network elements 108-112 are not necessary to describe here further to understand the present invention. Of course, the IMS network 104 further contains numerous other nodes and functions, which are not shown here for the sake of simplicity.

One example of services that can be employed by means of an IMS network is the so-called "Presence" services. In this type of services, "Presence" is basically a dynamic and variable state profile of a client, and the presence services basically involve the publishing of "presence data" of a client to make it available for other users and applications, which further can be used to control other services in turn. Presence data basically defines the state or situation of a client and his/her equipment in some

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predefined respect. Thus, the term "presence" is here given a very broad meaning, and the presence data may include, e.g., the following "client states":

- A client status, e.g. available, busy, in a meeting, on holiday, etc.
- A terminal status, e.g. switched on/off, engaged, out of coverage, etc.
- The geographic location of the client/terminal.
- Terminal capabilities and selections, e.g. functionality for SMS, MMS, chatting, games, video, etc.
- Other personal client information, e.g. interests, occupations, personal characteristics, moods, etc.

This information, or any selected parts thereof, is stored in an application server in the IMS network, based on so-called "publications of events" received from the network or a client, whenever the client changes any of his/her presence data. A client may also subscribe for selected presence data of one or more other users, e.g. according to a list of users. Such presence subscriptions are typically also handled by an application server in the IMS network. The subscribing client can then receive notifications regarding current presence data, either automatically or upon request. In SIP, a message called "SIP PUBLISH" can be used by clients to provide dynamic data to an application server in the IMS network. Further, another SIP message called "SIP SUBSCRIBE" can be used by clients to subscribe for dynamic data of other clients, as handled by the application server.

In traditional telecommunication systems, communication channels are more or less fixed and static,

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with predictable bitrates and protocols. Using the new access technologies, however, the network environment becomes more dynamic and heterogeneous to users, with great variations of the available communication resources in wireless networks, as different types of connection can be used, even within a call session. As a result, bitrates and modulation and encoding schemes become highly variable. Yet, users moving around in and between networks expect to be able to access and utilize a variety of services regardless of such variations. It is therefore desirable to develop services that can be adapted, or "tailored", to the current user situation and network environment.

Recently, a concept has been developed to provide refined information on objects to increase the usability of applications for invoked services, depending on the object's current situation. An "object" in this respect is typically a human user but may also be a physical device or apparatus, or an enterprise offering merchandise or services to customers. The term "object of interest" will be used in this description to represent any such object. This new concept is generally referred to as the distribution of "context" information, which may be implemented by using similar mechanisms as of the above-described presence services. It is therefore desirable to develop "context-aware" applications to achieve services optimally adapted to the prevailing circumstances.

This may be illustrated by a first example when a telecommunication service involving a navigation aid has been invoked by a mobile user. A context may then be defined in an IMS server for that user, being the object of interest in this case. The context may be maintained in the server e.g. for as long as the user is logged-on, or as long as

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he/she is a subscriber in the IMS network. An application used for this service may then investigate the current context of the user and provide a map to the user adapted to include or exclude certain features depending on, e.g., the user's preferences, current position and current type of communication connection, as being given by the context. In this case, the context information reflecting the user's situation can thus be used to create an optimal presentation format, i.e. the displayed map.

Fig. 2 illustrates a previously proposed server configuration for providing context information on an object of interest to a requesting entity, or "context consumer". A context server 200 is shown, adapted to provide context information to any authorized user, device or application, generally illustrated here as a "requesting party" 202. It should be noted that the object of interest for which context information is maintained may be a person, device, apparatus, system, etc. Further, the requesting party 202 may likewise be a person, e.g. a presence subscriber as described above, or a device. The requesting party 202 may also be an application being used to enable a service, such as the navigation aid service described above.

The context server 200 includes a context manager 204, an advertiser 206 and an admission control function 208, to be described below. The context manager 204 continuously collects information on the object of interest, here schematically illustrated as a dashed box 210a, by receiving object data from various sources, indicated as sensors S 210. The sensors 210 are adapted to measure or register various "variables" or the like characterizing the current state, status or situation of the object 210a. For example, the sensors may be adapted to measure physical

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characteristics such as temperature, or to register some current object status such as any of the client states mentioned above for presence services. In another tangible example, the object of interest may be a power switch and a single sensor may then be adapted to simply register whether the switch is on or off.

Raw context data from the sensors 210 is received and stored in a context storage unit 212 in the context manager 204. The stored raw data may then be processed and refined in a context refiner 214 by applying predefined rules 216 on the raw data, in order to derive or calculate new refined context information from the raw data. The predefined rules 216 may include algorithms or the like that calculate certain parameters, draw conclusions or create compilations from the raw data. For example, in the case of the above-mentioned power switch, rules may be defined to derive various statistic parameters. One rule may calculate the total amount of time the switch has been on and off, respectively. Other rules may calculate the maximum, minimum and mean duration of periods it has remained on and off, respectively, and so forth.

The refined context can then be distributed correctly to any requesting party by means of a distributor 218. The requesting party 202 may first discover what context information can be obtained from the context server by checking advertisements or announcements provided by means of some "exposure" mechanism according to suitable information from the advertiser 206. For example, advertisements or announcements regarding available context information may be exposed, as indicated in the figure by a dashed line, by means of a separate server or the like. Then, the requesting party 202 may make a request for

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context information which is received at the admission control unit 208. This unit 208 is adapted to apply a policy on the context request to determine whether the requesting party 202 is authorised to receive context information of the object of interest. The policy has been defined basically by the context owner, e.g. a network operator. If so, the admission control unit 208 triggers the distributor 218 to provide the latest context information to the requesting party 202. The policy may also dictate that a particular requester is allowed to receive only some part of the available context information. It should be noted that the context request may be a request for a subscription to receive context information from the context server on a more or less continuous basis.

Typically, the context information pertains to an individual object, e.g. a person. However, an object may also belong to a group of objects, e.g. persons, having an aggregate profile shared by its members. A group membership per se may be regarded as a parameter in an individual context. For example, members of a family may each have an individual context while the family may have a common context with an aggregate profile shared by its members. Today, no mechanism is available for creating an aggregated context for a group of individuals or devices.

Using the above-described solution of Fig. 2, the rules creating the refined context information are predefined and fixed, and the refined context information can be provided to any authorised requesting party. In this way, the requesting party can only receive context according to its predefined form, which is sometimes a problem since it may not be exactly what the requesting party needs or desires. However, no flexible solution is available today

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for meeting the particular needs of a requesting party, being limited to the predefined context refinements only. The requesting party will also receive all the available context information, sometimes limited by the policy, even though parts of it may not be needed.

Moreover, group membership can only be expressed today as a parameter in individual contexts. However, a group may exist regardless of whether its members are active or not and may persist even when its members actually leave the group. This may cause problems when a group membership is a parameter in an individual context, since the aggregate profile of that group's context is disregarded in an individual context.

It is also sometimes desirable for a group of users to collectively obtain context information, which can be a tedious procedure using the existing solution since its members may have different needs and preferences. In another practical example, a group of users intend to visit a restaurant together and may invoke a telecommunication service providing information on available restaurants and their menus, e.g. based on user locations and preferences. Each user in the group can then invoke such a service and typically receive different results depending on differences in location and preferences. It is then up to the users to coordinate the results and agree on a restaurant that satisfies all users in the group, which naturally may be difficult and time wasting.

To conclude, more flexibility in context servers is desirable when providing context information, and it is also desirable to handle group contexts more efficiently. Further, a useful solution is needed for providing relevant

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context information on an object of interest to a group requiring a minimum of efforts from its members.

SUMMARY OF THE INVENTION

The object of the present invention is to reduce or eliminate the problems outlined above. In particular, it is an object of the present invention to provide a solution for meeting specific needs and requirements of a requesting party when obtaining context information from a context server.

This object and others are achieved primarily by providing a method and apparatus for obtaining context information from a context server maintaining a context for an object of interest in a telecommunication network, said context server receiving raw context data from sensors associated with the object of interest.

In the inventive method, a request for refined context information with reference to said object of interest, is received from a requesting party. Individual context data is collected for at least one individual entity of the requesting party, and a customized rule is created on the basis of the received individual context data. The rule defines conditions in an adapted request for refined context information regarding the object of interest. The adapted request including the customized rule is then sent to the context server of the object of interest. Finally, context data refined according to the rule is received from the context server.

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The individual context data is preferably collected from at least one context manager maintaining a context for said individual entity or entities. If the requesting party is a group of plural individual entities, individual context data is collected for each of the individual entities, the received individual context data is aggregated into a group context, and the customized rule is created from the group context.

Preferably, a context template structure is used for collecting the individual context data. The template comprises predefined data fields for parameters of relevance to the requesting party which are filled with current context data of the requesting party. The context template may be presented as an XDM document communicated by means of an IMS interface using a SIP/Simple protocol. The context template can be created by extending a generic template, comprising standard fields for basic data defining a requesting party in general, into an applied template further comprising fields for the context parameters. In the case when the requesting party is a group of plural individual entities, the generic template may include standard fields for a group identity, group members and optionally a group administrator, if used. The applied template may also include parameter fields for each of the individual entities.

The inventive apparatus comprises means for receiving, from a requesting party, a request for refined context information with reference to said object of interest. The apparatus further comprises a context gathering unit adapted to collect individual context data for at least one individual entity of the requesting party. The apparatus further comprises a context aggregation unit

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adapted to create a customized rule on the basis of the received individual context data. The rule defines conditions in an adapted request for refined context information regarding the object of interest. The apparatus further comprises means for sending the adapted request including the customized rule to the context server of the object of interest, and means for receiving, from the context server, context data refined according to that rule.

The context gathering unit is preferably further adapted to collect individual context data from at least one context manager maintaining a context for said individual entity or entities. In the case when the requesting party is a group of plural individual entities, the context gathering unit is further preferably adapted to collect individual context data for each of the individual entities. The context aggregation unit is further preferably adapted to aggregate the received individual context data into a group context and to create the customized rule from the group context.

The context gathering unit may be further adapted to use a context template structure for collecting the individual context data. The template comprises predefined data fields for parameters of relevance to the requesting party to be filled with current context data of the requesting party. The context gathering unit is preferably further adapted to use an XDM document as the context template communicated by means of an IMS interface using a SIP/Simple protocol. The context gathering unit may be further adapted to create the context template by extending a generic template, comprising standard fields for basic data defining a requesting party in general, into an applied template further comprising fields for the context

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parameters. In the case when the requesting party is a group of plural individual entities, the generic template may include standard fields for a group identity, group members and optionally a group administrator, if used. The applied template may also include parameter fields for each of the individual entities.

The present invention further embraces a method of providing context information from a context server maintaining a context for an object of interest in a telecommunication network, the context server receiving raw context data from sensors associated with the object of interest. According to the latter method, an adapted request is received, originating from a requesting party for refined context information regarding the object of interest. The adapted request includes a customized rule that has been created on the basis of collected individual context data for at least one individual entity of the requesting party, the rule defining conditions in the adapted request. The raw context data is refined by applying the received customized rule, and the refined context information is finally provided for delivery to the requesting party. The received customized rule has preferably been derived from a group context aggregated from a plurality of individual contexts of group members.

The present invention further embraces a corresponding apparatus for providing context information from a context server maintaining a context for an object of interest in a telecommunication network, the context server receiving raw context data from sensors associated with the object of interest. The latter apparatus comprises means for receiving an adapted request originating from a requesting party for refined context information regarding the object

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of interest. The adapted request includes a customized rule that has been created on the basis of collected individual context data for at least one individual entity of the requesting party, the rule defining conditions in the adapted request. The latter apparatus further comprises means for refining the raw context data by applying the received customized rule, and means for providing the refined context information for delivery to said requesting party. The received customized rule may have been derived from a group context aggregated from a plurality of individual contexts of group members.

It will be appreciated from the following description of preferred embodiments that the latter apparatus for providing context information from a context server can work together with the former apparatus for obtaining context information from a context server, so as to form a mutual inventive concept. The same applies also to the latter method of providing context information from a context server and the former method of obtaining context information from a context server. Further preferred features and benefits of the present invention will become apparent from the detailed description below.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will now be described in more detail by means of preferred embodiments and with reference to the accompanying drawings, in which:

- Fig. 1 is a basic network configuration for communicating multimedia, according to the prior art.
- Fig. 2 is a block diagram of a context server generally providing refined context information to a requesting party, according to the prior art.

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- Fig. 3 is a block diagram of a communication scenario where refined context information is obtained for a group of individuals from a context server, in accordance with one embodiment.
- Fig. 4 is a block diagram of a communication scenario where refined context information is obtained for a group of individuals from a context server, in accordance with another embodiment.
- Fig. 5 is a state diagram for a group of individuals as handled by a group manager when obtaining refined context information for said group, in accordance with yet another embodiment.
- Fig. 6 is a block diagram of a communication scenario where refined context information is obtained for a sole individual from a context server, in accordance with yet another embodiment.
- Fig. 7a and 7b illustrate a generic template and an applied template, respectively, which can be used for creating a customized rule to obtain refined context information, in accordance with yet another embodiment.
- Fig. 8 illustrates how a template is handled within a aggregated context function, in accordance with yet another embodiment.
- Fig. 9 is a flow chart illustrating a procedure for obtaining wanted context information from a context server maintaining a context for an object of interest, as executed by an aggregated context function.
- Fig. 10 is a flow chart illustrating a procedure for providing wanted context information, as executed by a context server maintaining a context for an object of interest.

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DESCRIPTION OF PREFERRED EMBODIMENTS

Briefly described, the present invention provides a solution where the particular needs of a requesting party can be met when providing relevant context information adapted thereto. In this solution, a "customized" rule can be created for the requesting party defining conditions for refined context information adapted to its own requirements and needs regarding a specific object of interest. As used herein, the term "rule" may represent any algorithm or the like that calculates certain parameters, draws conclusions or creates compilations from raw context data. Preferably, after receiving a request for refined context information from a requesting party, the customized rule may be defined by means of a context template comprising predefined data fields for parameters of relevance to the requesting party according to the request. The empty parameter fields in the template can then be filled with current context data of the requesting party.

An adapted request for refined context information, including the customized rule as created from the filled template, is then submitted to a context server of the object of interest, e.g. like the one described in Fig. 2. The context server will then apply the new rule for refining received raw context data, in order to provide context information in the desired form to the requesting party. Thereby, the requesting party will not be limited to the predefined and fixed context refinements and rules, but can request for context information tailored to its own needs and requirements. The present invention can be used when the requesting party is either a sole individual or a plurality of individuals together making up a group, which will be described in more detail below.

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The inventive procedure and arrangement for obtaining wanted context information from a context server will now be described by way of exemplary embodiments, initially with reference to Fig. 3. In this embodiment, a context server 300 is basically configured as the prior art context server 200 shown in Fig. 2, thus having a context manager 302 and an admission control function 304 based on a predefined policy. No advertiser function is shown in this figure although it may be included here as well. Likewise, the context manager 302 includes a context storage unit 308 receiving and storing raw context data coming from sensors 306 associated with the object of interest 306a. The stored raw data is then processed in a context refiner 310 according to predefined rules 312, in order to produce refined context information, basically in the same manner as described for Fig. 2, to be provided to any authorised requesting party by means of a distributor 314.

In this example, a requesting party is composed of a group of individuals 316, here shown as entities A,B,C..., and a group context valid to its members is created by means of an "aggregated context function" 318, which may be implemented in a server or the like in a service network, e.g. an IMS network. However, the mechanisms described below could be used for a sole requesting entity as well. In the embodiments described here, the aggregated context function will generally be considered as a node.

Each individual A,B,C... has in turn an associated context manager CM_A, CM_B, CM_C, ... 320 maintaining a context on behalf of its associated individual, basically in the same manner as the context server 302 does on behalf of the object of interest 306a. For example, if the individuals A,B,C... are mobile users, their contexts may include

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specifics regarding their terminal capabilities, current status, personal preferences and current position, although the present invention is not limited in this respect. Hence, each context manager 320 receives raw context data from sensors, not shown, associated with the respective individual 316.

In the present solution, the aggregated context function 318 creates an aggregated group context that is collectively valid for all members 316 of the group, at least in some respects, e.g., that the members have agreed upon when forming the group. Alternatively, an existing group may be imported where the group memberships are already fixed. Here, it is assumed that the group has been formed and the aggregated context function 318 has received a request for context information from the group, which will be described in more detail later below. In a first illustrated step **3:1**, the aggregated context function 318 collects individual context information from each of the context managers CM_A, CM_B, CM_C, ... 320. In the case of a very large group, a proxy (not shown) can be used to receive numerous context updates from the context managers 320 of the group individuals, in order to avoid overloading of the aggregated context function 318. The proxy may then select and forward only updates with changes significant to the interests of the group, thereby acting as a filter. The proxy may thus be configured to only forward context changes "important" to the request made, as for example changes of user position exceeding a certain limit.

An aggregated group context is then created in the aggregated context function 318 on the basis of the individual contexts received in step 3:1, preferably by using a context template as mentioned above which will also

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be described in more detail later below. A corresponding customized rule is then defined and sent to the context server 300 as an adapted request for refined context information, in a next step **3:2**. This rule is thus a combined result of the aggregated group context and the initially received request from the requesting party. The customized rule thus represents in effect a request to the context server 300 for refined context information in a form adapted to the requirements and needs of the group members as dictated by their contexts.

If this solution is implemented in an IMS network, the rule/template can preferably be presented as an XDM (XML Data Management) document which is a specialised language for the management of lists in IMS environments. The XDM-defined rule may then be communicated by means of an IMS interface using a SIP/Simple protocol between the aggregated context function 318 and the context server 300, although other transport means are also possible. Further, the aggregated context function 318 may be implemented in a Presence and Group Management server (PGM) as defined for IMS networks.

In another tangible example, a customized rule may be defined as conditions in a request from a group of mobile users for a suitable meal at a restaurant. The rule should then be defined to satisfy the preferences of all group members, or at least as many as possible, and can be derived from the aggregation of their individual contexts. For example, a first member may be allergic to peanuts, a second member may prefer rice and a third member may reject spicy food, etc. The created rule may then include the following request with conditions: "Propose any non-spicy meals containing rice but no peanuts". Further preferences

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regarding a cost limiting parameter may include member A: max 200 SEK, member B: max 250 SEK member C: max 300 SEK, etc. In the aggregated group context, the cost parameter would become: max 200 SEK, satisfying all members A-C.

Location information on the individual members may also be used to further define a requirement in the rule for the restaurant's locality, e.g. "Propose restaurants that fulfil the above condition located within 500 meters from a certain spot". As a service is then invoked using a context server providing information on available restaurants and their menus, the created rule is submitted thereto. The response from the context server may then comprise a list of any restaurants, preferably including menus, fulfilling the conditions set by the customized rule.

It should be understood from the examples given above that a person skilled in the art would be able to produce a logic for aggregating collected individual contexts into a group context and a customised rule, with respect to parameters relevant to the request.

Returning to Fig. 3, the created customized rule sent to context server 300 in step 3:2 is checked at the admission control unit 304 to determine if the request is authorised according to a prevailing policy. Assuming that this is the case, the new rule 312a is added to the existing rules 312 in the context manager 302 in a step **3:3**, in order to produce refined context information according to the conditions and requirements in the rule 312a. Rule 312a is thus applied in the context refiner 310 in a step **3:4**, and the distributor 314 then provides the refined context, as being prepared according to the rule 312a, as a response to the aggregated context function 318, in a further step **3:5**. The aggregated context function 318 can then finally hand

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out the information results to any of the individual entities 316, e.g. according to a predetermined scheme, in a final step **3:6**. The results may also be conveyed to a separate application server 322 or the like that can be accessed by any individual 316 for obtaining said results.

Fig. 4 illustrates a procedure and arrangement for obtaining refined context information from a context server, as similar to the scenario of Fig. 3, with the aggregated context function 400 being illustrated in more detail. As in Fig. 3, the aggregated context function 400 collects individual contexts from context managers 402 associated with a group of individual entities 404, and sends a customized rule to context server 406. In this embodiment, the aggregated context function 400 includes a group manager 408, a context gathering unit 410 and a context aggregation unit 412, to be described below.

In a first step **4:1**, an entity A out of a group of individual entities 404 sends a request for context information with reference to an object of interest, on behalf of a specified group, to the aggregated context function 400. The request may be drawn up depending on what is offered, e.g. from an exposure mechanism as described for Fig. 2, or depending on what may generally be of interest to the group. As mentioned above, the group may be a new one or an imported existing one. If the individuals 404 are mobile users, one of them may take the initiative to make a request for a group having mutual interests in some respect, e.g. for having a meal together at lunchtime. Alternatively, a separate service managing unit or administrator, not intended to be a group member itself, may send the context information request, e.g. if the individual entities 404 are

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correlated applications for enabling a communication service or the like.

In any case, the request for context information to a group is received by a group manager 408 which defines and maintains the group in a data structure 408a, e.g. comprising a member list or the like. Any parameters determining a context for the group may also be defined in the group manager 408, such as current states and preferences. Preferably, only parameters relevant to the context information request are defined. In one embodiment, a context template structure may be defined with fields for these parameters, to be filled with current context information, which will be further described later below.

In a next step **4:2**, the context information request is conveyed to the context aggregation unit 412 to be used later, as will be described below. As the group has been created and activated by the group manager 408, the context gathering unit 410 collects current individual context data from the context managers CM_A, CM_B, CM_C, ... 402 associated with their respective individuals 404, in a following step **4:3**, just as in step 3:1 of Fig. 3. It should be noted that the order of steps 4:2 and 4:3 could be reversed.

The gathered contexts are then conveyed to the context aggregation unit 412, in a step **4:4**, which then aggregates the individual contexts into a common group context. Combined with the context information request conveyed in step 4:2, the group context can be translated into conditions in an adapted request for refined context information from the context server 406. These conditions can be expressed as a customized rule that the unit 412 creates. The context aggregation unit 412 then sends the rule 414 as a request to context server 406, in a next step

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4:5, the rule thus defining the conditions for the request. After refining raw context data, basically as described for step 3:4 in Fig. 3, the context server 406 provides context information refined according to the submitted rule 414, back to the group manager 408, in a step **4:6**. Finally, as illustrated in a step **4:7**, the group manager 408 can send out the information results to any of the individual entities 404, e.g. according to some predefined scheme, or to an accessible application server or the like, although the present invention is not limited in this respect.

Fig. 5 is a state diagram for a group according to another embodiment. The group can preferably be maintained by the group manager 408 shown in Fig 4. In a first state 500, the group is created in response to a group formation trigger **5:1**, which may be a context information request for a specified group from a user, an appointed group administrator or a service application manager, as mentioned above. Group creation includes specifying its members and defining parameters of interest, etc.

When the process of creating the group is completed, the group enters an active state 502 where current individual context data can be received and updated, as indicated by arrows **5:2**. The group parameters may also be modified in the active state at any time during the lifetime of the group, as indicated by arrows **5:3**, e.g. when memberships change for the group as members leave or join the group, or when the group profile or parameters are updated by its members or a group administrator, e.g., regarding preferences and policies etc.

The group may at any point during its lifetime enter an inactive state 504 in response to an inactivation trigger **5:4**. In the inactive state, no context data or

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modifications can be received and the group is dormant until awoken by an activation trigger **5:5**. The inactivation trigger 5:4 may come from a group member or administrator or may be the expiry of a predefined timeout limit, e.g. a limited total lifetime of the group or the time since the group received the latest new context data or modification. The activation trigger 5:5 may typically come from a group member or administrator. An activation trigger may also be the fulfilment of a predefined context condition, e.g. when a certain number of group members are located within a predetermined radius, etc. If this condition is fulfilled for only some of the group members, a subgroup of these members may be defined in an aggregated context function as being active.

The group may finally be resolved in response to a deletion trigger **5:6**, typically from a member or administrator having determined that the group has become obsolete. A group deletion state 506 is then entered which is final. Alternatively, the deletion trigger may be a timeout parameter similar to the above-described inactivation trigger 5:4. The main difference is that the active state 502 can be entered from the inactive state 504, but not from the deletion state 506.

It will now be described how refined context information on an object of interest can be obtained from a context server associated therewith, when the requesting party is a sole individual, with reference to Fig. 6. An aggregated context function 600 is shown basically comprising the same components as function 400 in Fig. 4, namely a group manager 602, a context gathering unit 604 and a context aggregation unit 606.

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A request for refined context information with reference to the object of interest is received from the sole individual A 608, in a first step **6:1**. In this case as well, the context information request may be received from a separate service managing unit or administrator, not shown. Since no group is to be created and maintained for the sole individual 608, the group manager 602 can be bypassed, and the request can be directly conveyed to the context gathering unit 604. In response thereto, the context gathering unit 604 collects individual context data from a context manager CM_A 610 associated with the individual 608, as illustrated by a step **6:2**.

Parameters relevant to the context information request are also defined by the context gathering unit 604, preferably using a context template structure with parameter fields which are filled with the context data collected in step 6:2. Exemplary context template structures will be described in more detail below.

In a next step **6:3**, the collected context information is conveyed to the context aggregation unit 606, preferably presented as a filled-in template, together with the context information request received in step 6:1. Unit 606 now aggregates the received individual context and the context information request by creating a customized rule 612 containing resultant conditions, as an adapted request for context information from the context server 614. The context aggregation unit 606 then sends the rule 612 as a request to context server 614, in a next step **6:4**, the rule thus defining the conditions for the request.

After refining raw context data according to the received rule 612, the context server 614 provides refined context information back to the context gathering unit 604,

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in a step **6:5**. It should be noted that the group manager 602 may once again be bypassed, as compared to the example of Fig. 4 described above, and is basically transparent throughout the process. In a final illustrated step **6:6**, the context gathering unit 604 can send out the information results to the individual 608, or to an accessible application server or the like.

As mentioned above, a context template structure may preferably be defined with fields for parameters relevant to a received context information request. These parameter fields can thus be used for collecting and registering current individual contexts of members in a created group, or the context of a sole individual when applicable. The parameter fields are then filled with corresponding data from each collected context. Fig. 7a and 7b illustrate a generic template structure and an applied template structure, respectively, in accordance with a preferred embodiment, here shown as XDM documents using XML.

A "generic template" data structure comprises standard fields for basic data defining a requesting party in general. The generic template 700 shown in Fig. 7a comprises such standard fields for a group identity, group members (here shown as fields for members A, B and C) and optionally a group administrator, if used. The fields for members and administrator should preferably accommodate suitable identities and network addresses for communication.

When a customized rule is to be created on behalf of a requesting party, in order to obtain refined context information from a context server as described above, parameters relevant to the context information request are to be defined. This can be done by extending the generic template 700 to become an "applied template" 702 shown in

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Fig. 7b, by adding an application specific part 704 for an application used for the request. Part 704 includes an application name and fields 706 for one or more defined context parameters 1, 2, 3… relevant to that application and to the request. In the applied template 702, the empty parameters fields 706 can now be filled with collected context information for each member during the context gathering process, e.g. as described for step 4:3 in Fig. 4 or step 6:2 in Fig. 6.

Fig. 8 illustrates an example of how such template structures can be used in an aggregated context function 800, similar to the one denoted 400 in Fig. 4, comprising a group manager 802, a context gathering unit 804 and a context aggregation unit 806. In a first step **8:1**, group manager 802 receives a context information request from a requesting party 808, in this case a group of plural individuals A,B,C… of which A makes the request. After defining parameters relevant to the context information request, group manager 802 takes a generic template, shown in Fig. 7a, as a starting point for creating an applied template structure 812 including, for each group member, fields for the defined parameters which are initially empty, as shown.

The applied template 812 is then conveyed to the context gathering unit 804, in a step **8:2**. Further, the context information request received in step 8:1 is also conveyed to the context aggregation unit 806, in a step **8:3**. The context gathering unit 804 now collects individual contexts from context managers 810 associated with the group members, in a next step **8:4**. When doing this, it fills the parameter fields of the applied template with the collected context for each group member. It should be noted that it

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may well happen that not all parameters are available for some individual entities, such that some fields will remain empty on information. It is further possible to define some parameters as "mandatory" and others as "optional". If any entity fails to provide context information for a mandatory one, the resulting behaviour may depend on the situation and/or application used. When the context collecting process is completed, the filled-in template 814 is conveyed to the context aggregation unit 806, in a next step **8:5**.

In a final step **8:6**, unit 806 creates a customized rule 816 on the basis of the context information in the template 814 received in step 8:5 and the request received in step 8:3. The rule 816 can then be submitted to the context server in order to obtain refined context information therefrom basically in the manner described for Fig. 3.

According to one aspect of the present invention, a method is provided for obtaining context information from a context server, e.g. 300, 406 or 614, maintaining a context for an object of interest, e.g. 306a, in a telecommunication network. A general procedure for this, as performed by an aggregated context server described for Fig's 3,4,6 and 8, will now be described with reference to a flow chart shown in Fig. 9. It is assumed that the context server receives raw context data from sensors, e.g. 306, associated with the object of interest.

In a first step **900**, a request for refined context information regarding an object of interest is received from a requesting party, representing either a sole individual or a group with plural individuals.

In a next step **902**, individual context data is collected for at least one individual entity of the

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requesting party, preferably from either a content server of a sole individual or plural content servers of individuals in a group. Preferably, a context template structure is used comprising predefined data fields for parameters of relevance to the requesting party according to the request. The parameter fields are then filled with current context data of the requesting party for each individual.

In a next step **904**, a customized rule is created based on collected individual context data, and also with respect to the request received in step 900. As described above, a customized rule may be created by means of the filled-in template.

In a next step **906**, an adapted request for refined context information regarding the object of interest, including the customized rule, is sent to the context server maintaining the context for the object of interest.

In a final step **908**, context data refined according to said rule is received from the context server, to be delivered to the requesting party.

According to another aspect of the present invention, a method is provided for providing context information from a context server maintaining a context for an object of interest, e.g. 306a, in a telecommunication network. A general procedure for this, as performed by a context server, e.g. 300, 406 or 614 as described for Fig's 3,4 and 6, respectively, will now be described with reference to a second flow chart shown in Fig. 10. The context server receives raw context data from sensors, e.g. 306, associated with the object of interest.

In a first step **1000**, an adapted request for refined context information regarding the object of interest is received, the request originating from a requesting

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party. The adapted request includes a customized rule (312a,414) that has been created on the basis of collected individual context data for at least one individual entity (316,404) of said requesting party, the rule defining conditions in the adapted request.

In a next step **1002**, received raw context data is refined by applying the received customized rule.

In a final step **1004**, the refined context information is provided for delivery to said requesting party. According to the above-described embodiments, the refined context information is sent to an aggregated context function which then delivers it to the requesting party, e.g. to one or more individuals or to a separate accessible application server.

It should be noted that the above-described mechanism can be configured in different ways within the scope of the present invention, depending on the field of application and other factors. In another tangible example, the requesting party may be a group of mobile users wishing to activate a communication service known as PoC (Push-to-talk over Cellular) in which plural users can communicate collectively by pushing a button to open a channel in order to talk. In this case, the object of interest is comprised of network resources to enable the PoC communication. The network resources are typically owned and/or controlled by a network operator who also controls the associated context server including its policy for admission control. In order to optimise the resource usage, available capabilities of the users in the group should be determined before invoking the service. The following procedure A)-G) may then be executed, e.g. using the configurations shown in Fig. 3 or Fig. 4:

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A) The group is created or imported into a group context function, e.g. in the group manager 408.

B) A group context is created by aggregating individual contexts, e.g. in the context aggregation unit 412. If the service requires resources, a request for a specified group application associated with the service invokes the procedure for gathering context and creating a customized rule.

C) A customized rule is created to ascertain the communication resources allowed for the service and the capabilities of the users to use the service. Conditions in the rule thus reflect the user's situations.

D) The customized rule is sent to the context server maintaining a context for the network resources.

E) The customized rule is processed in the context server, e.g. server 300 or 406, once it has been verified by the admission control policies, e.g. admission control 304. The rule is applied to refine raw context data, in this case network information, and determines the resources the users are allowed to reserve.

F) A reply with the refined context is sent from the context server, e.g. by means of distributor 314, to the aggregated context function, and is further distributed to the group members. This may be expressed as a resource reservation rule for a service policy decision point (PDP) which is a known network entity for distributing network resources.

G) When the users finally invoke the service, they can send the resource reservation rule to a PDP for the given service.

To conclude, the present invention provides a solution for meeting specific needs and requirements of a

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requesting party when generally obtaining context information from a context server regarding an object of interest. Moreover, a mechanism is provided for handling group contexts effectively, and relevant context information can be obtained that is relevant to collective needs and requirements of a group.

While the invention has been described with reference to specific exemplary embodiments, the description is generally only intended to illustrate the inventive concept and should not be taken as limiting the scope of the invention, which is defined by the appended claims.

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CLAIMS

1. A method of obtaining context information from a context server (300,406,614) maintaining a context for an object of interest (306a) in a telecommunication network, said context server receiving raw context data from sensors (306) associated with the object of interest, **characterised by** the following steps:
- receiving, from a requesting party, a request for refined context information with reference to said object of interest,
- collecting individual context data for at least one individual entity (316,404) of said requesting party,
- creating a customized rule on the basis of the received individual context data, said rule defining conditions in an adapted request for refined context information regarding the object of interest,
- sending said adapted request including the customized rule to the context server of said object of interest, and
- receiving, from the context server, context data refined according to said rule.

2. A method according to claim 1, **characterised in** that said individual context data is collected from at least one context manager maintaining a context for said individual entity or entities.

3. A method according to claim 1 or 2, wherein the requesting party is a group of plural individual entities, **characterised in** that individual context data is collected for each of the individual entities, the

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received individual context data is aggregated into a group context, and said customized rule is created from the group context.

4. A method according to any of claims 1-3, **characterised in** that a context template structure is used for collecting the individual context data, said template comprising predefined data fields for parameters of relevance to the requesting party which are filled with current context data of the requesting party.

5. A method according to claim 4, **characterised in** that the context template is presented as an XDM document communicated by means of an IMS interface using a SIP/Simple protocol.

6. A method according to claim 4 or 5, **characterised in** that the context template is created by extending a generic template, comprising standard fields for basic data defining a requesting party in general, into an applied template further comprising fields for said context parameters.

7. A method according to claim 6, wherein the requesting party is a group of plural individual entities, **characterised in** that the generic template includes standard fields for a group identity, group members and optionally a group administrator, if used.

8. A method according to claim 6 or 7, wherein the requesting party is a group of plural individual entities, **characterised in** that the applied template

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includes parameter fields for each of the individual entities.

9. An apparatus for obtaining context information from a context server (300,406,614) maintaining a context for an object of interest (306a) in a telecommunication network, said context server receiving raw context data from sensors (306) associated with the object of interest, **characterised by:**
- means for receiving, from a requesting party, a request for refined context information with reference to said object of interest,
- a context gathering unit (410,604) adapted to collect individual context data for at least one individual entity (316,404) of said requesting party,
- a context aggregation unit (412,606) adapted to create a customized rule on the basis of the received individual context data, said rule defining conditions in an adapted request for refined context information regarding the object of interest,
- means for sending said adapted request including the customized rule to the context server of said object of interest, and
- means for receiving, from the context server, context data refined according to said rule.

10. An apparatus according to claim 9, **characterised in** that the context gathering unit is further adapted to collect individual context data from at least one context manager maintaining a context for said individual entity or entities.

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11. An apparatus according to claim 9 or 10, wherein the requesting party is a group of plural individual entities, **characterised in** that the context gathering unit is further adapted to collect individual context data for each of the individual entities, and that the context aggregation unit is further adapted to aggregate the received individual context data into a group context and to create said customized rule from the group context.

12. An apparatus according to any of claims 9-11, **characterised in** that the context gathering unit is further adapted to use a context template structure for collecting the individual context data, said template comprising predefined data fields for parameters of relevance to the requesting party to be filled with current context data of the requesting party.

13. An apparatus according to claim 12, **characterised in** that the context gathering unit is further adapted to use an XDM document as the context template communicated by means of an IMS interface using a SIP/Simple protocol.

14. An apparatus according to claim 12 or 13, **characterised in** that the context gathering unit is further adapted to create the context template by extending a generic template, comprising standard fields for basic data defining a requesting party in general, into an applied template further comprising fields for said context parameters.

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15. An apparatus according to claim 14, wherein the requesting party is a group of plural individual entities, **characterised in** that the generic template includes standard fields for a group identity, group members and optionally a group administrator, if used.

16. An apparatus according to claim 14 or 15, wherein the requesting party is a group of plural individual entities, **characterised in** that the applied template includes parameter fields for each of the individual entities.

17. A method of providing context information from a context server (300,406,614) maintaining a context for an object of interest in a telecommunication network, the context server receiving raw context data from sensors (306) associated with the object of interest, **characterised by** the following steps:
- receiving an adapted request originating from a requesting party for refined context information regarding the object of interest, including a customized rule (312a,414) that has been created on the basis of collected individual context data for at least one individual entity (316,404) of said requesting party, the rule defining conditions in the adapted request,
- refining the raw context data by applying the received customized rule, and
- providing the refined context information for delivery to said requesting party.

18. A method according to claim 17, **characterised in** that the received customized rule has been derived from a group

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context aggregated from a plurality of individual contexts of group members.

19. An apparatus for providing context information from a context server (300,406,614) maintaining a context for an object of interest in a telecommunication network, the context server receiving raw context data from sensors (306) associated with the object of interest, **characterised by** the following steps:
- means for receiving an adapted request originating from a requesting party for refined context information regarding the object of interest, including a customized rule (312a,414) that has been created on the basis of collected individual context data for at least one individual entity (316,404) of said requesting party, the rule defining conditions in the adapted request,
- means for refining the raw context data by applying the received customized rule, and
- means for providing the refined context information for delivery to said requesting party.

20. An apparatus according to claim 19, **characterised in** that the received customized rule has been derived from a group context aggregated from a plurality of individual contexts of group members.

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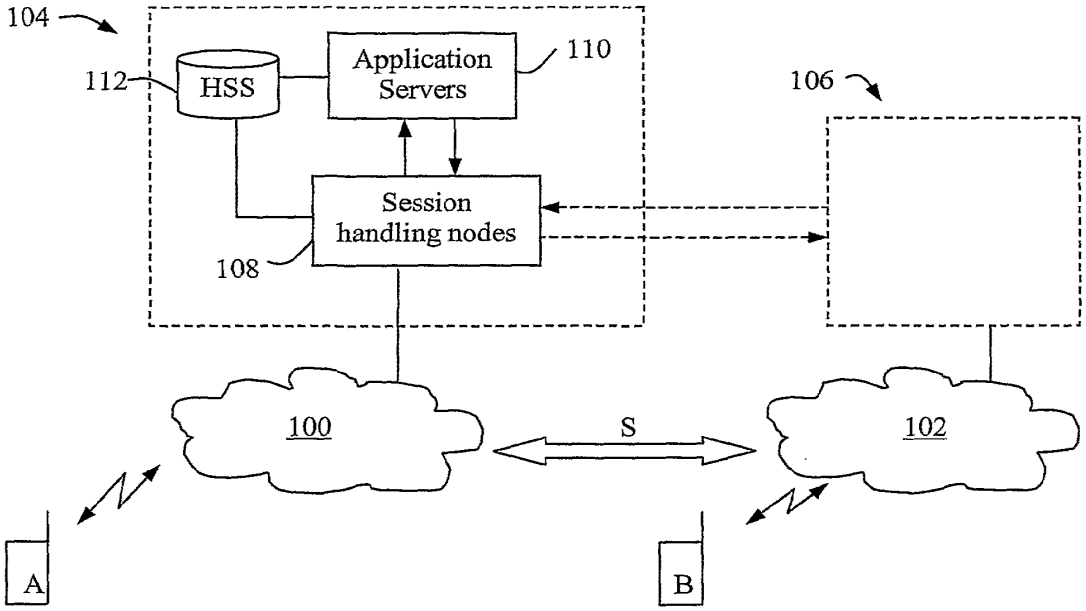


Fig. 1

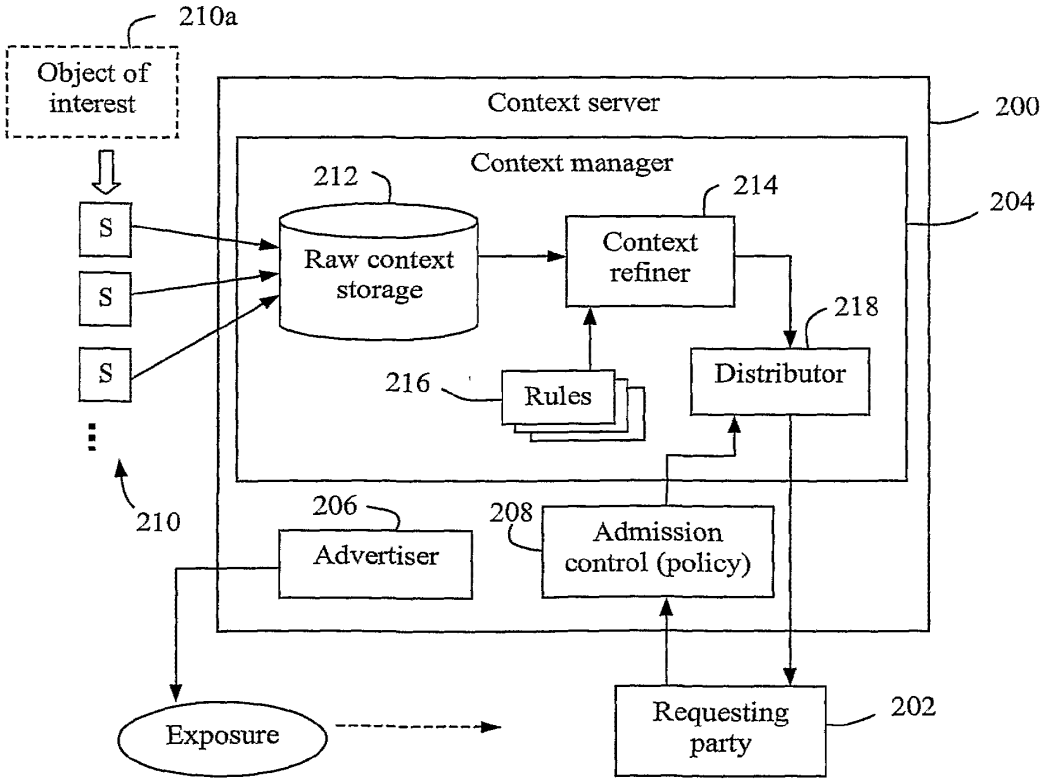


Fig. 2

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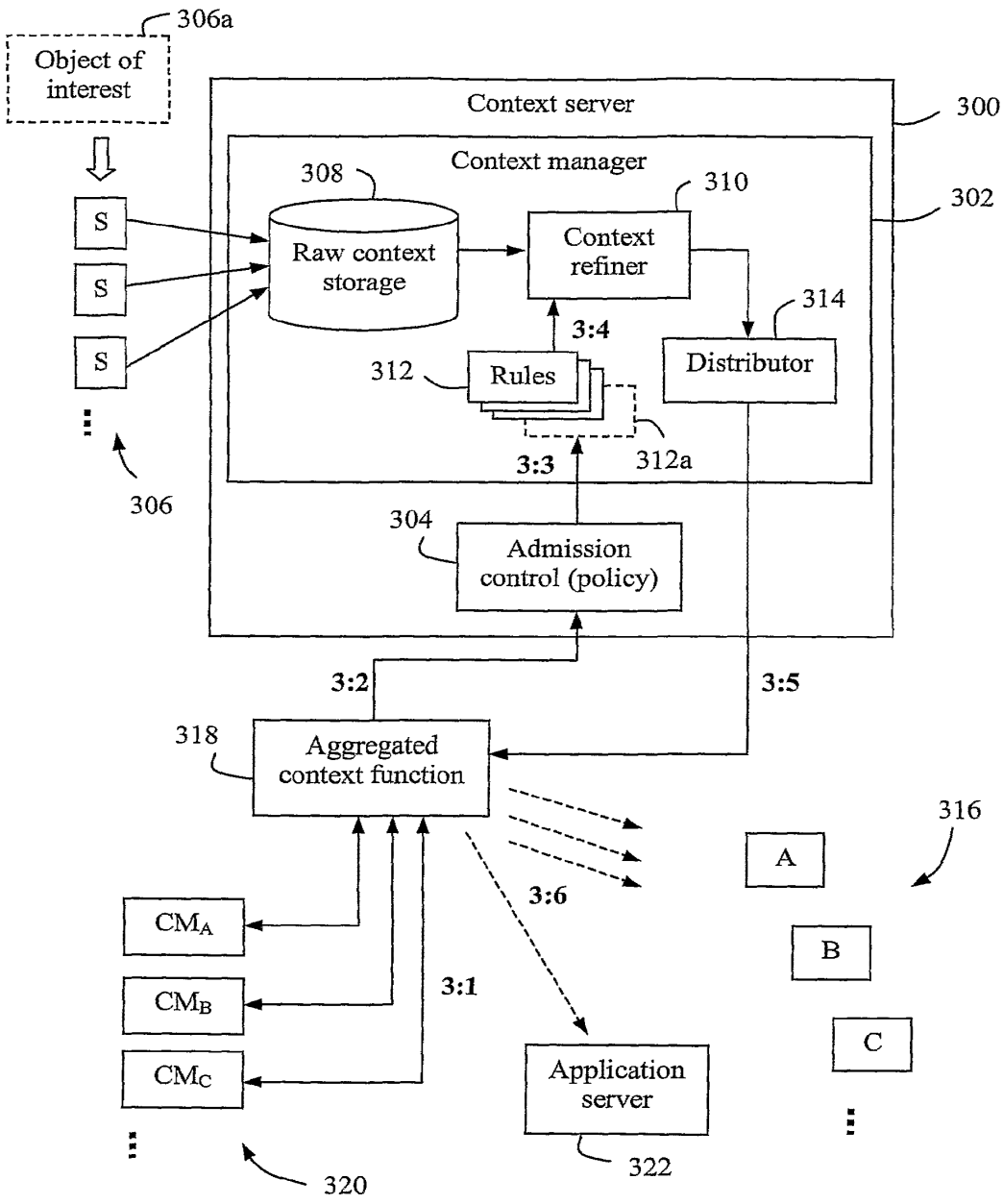


Fig. 3

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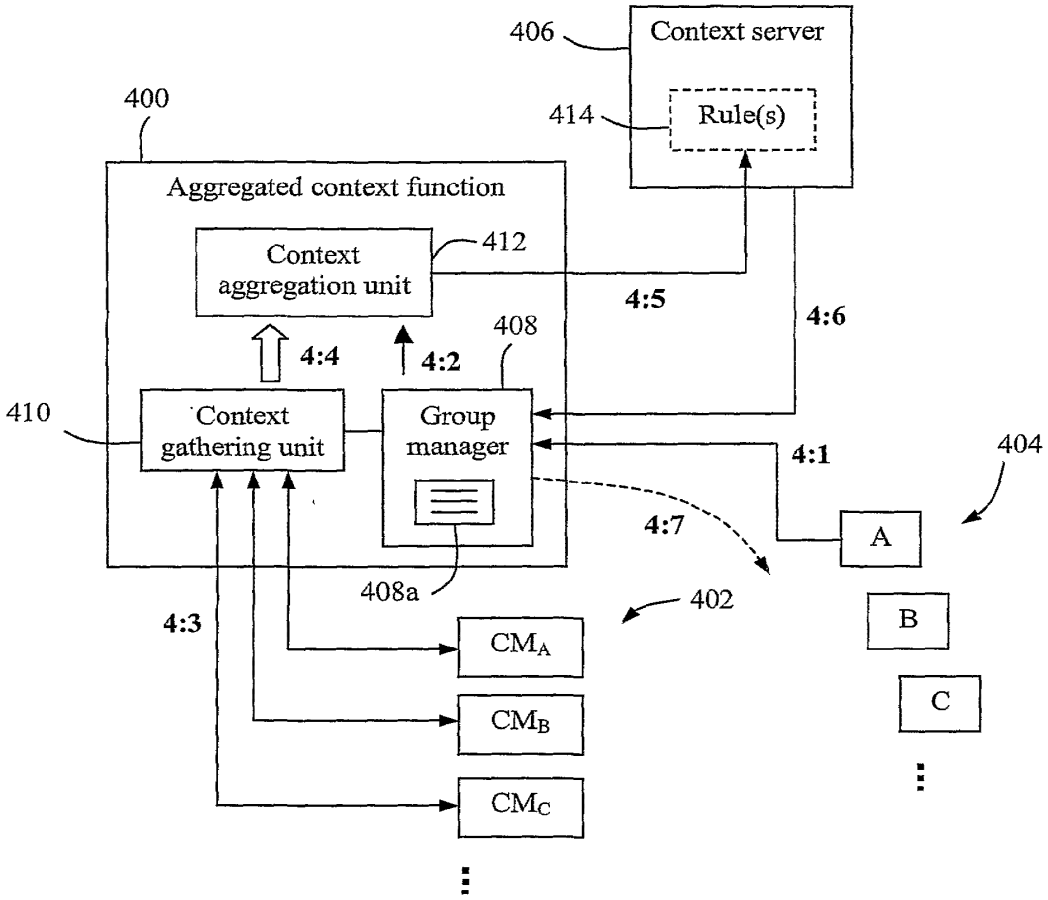


Fig. 4

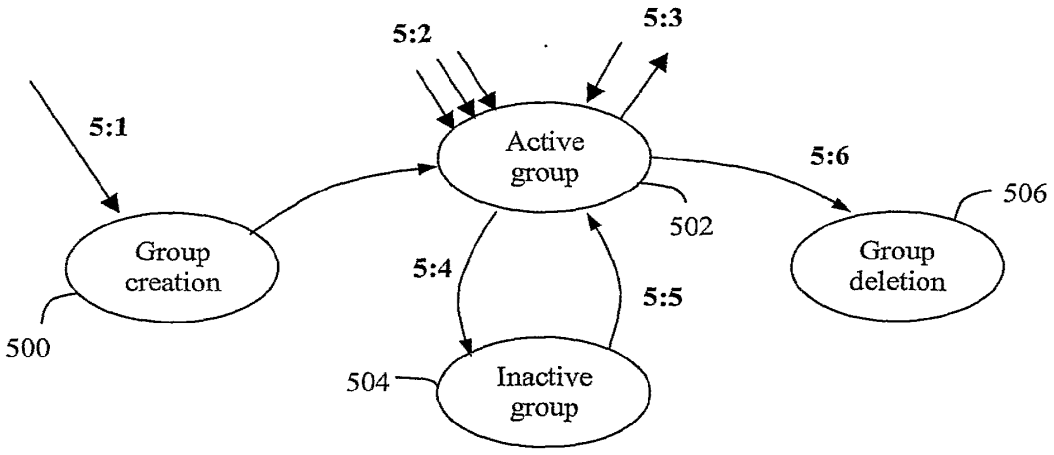


Fig. 5

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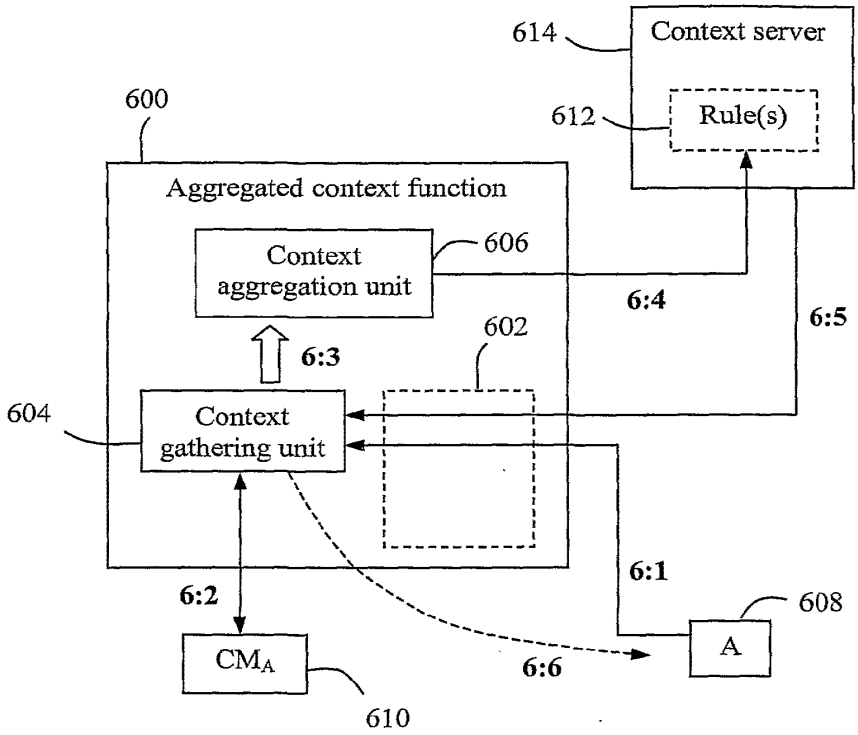


Fig. 6

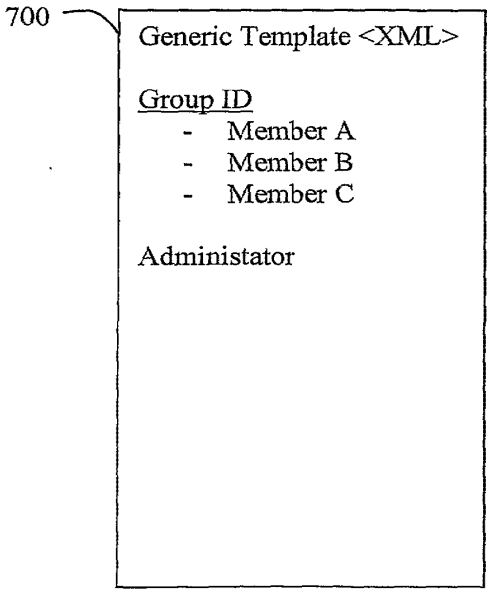


Fig. 7a

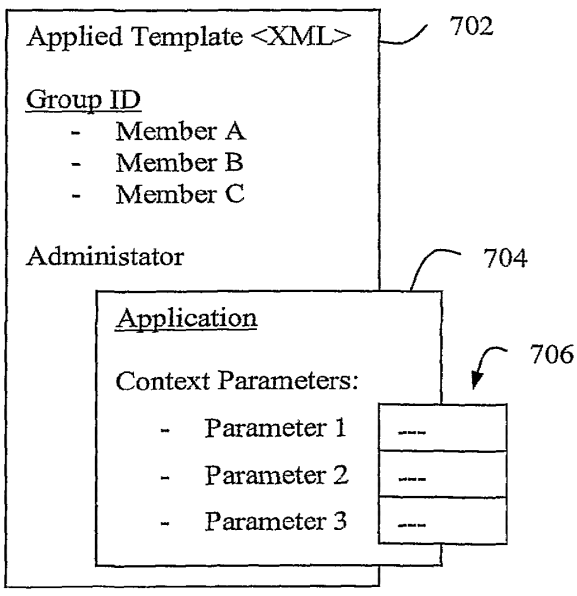


Fig. 7b

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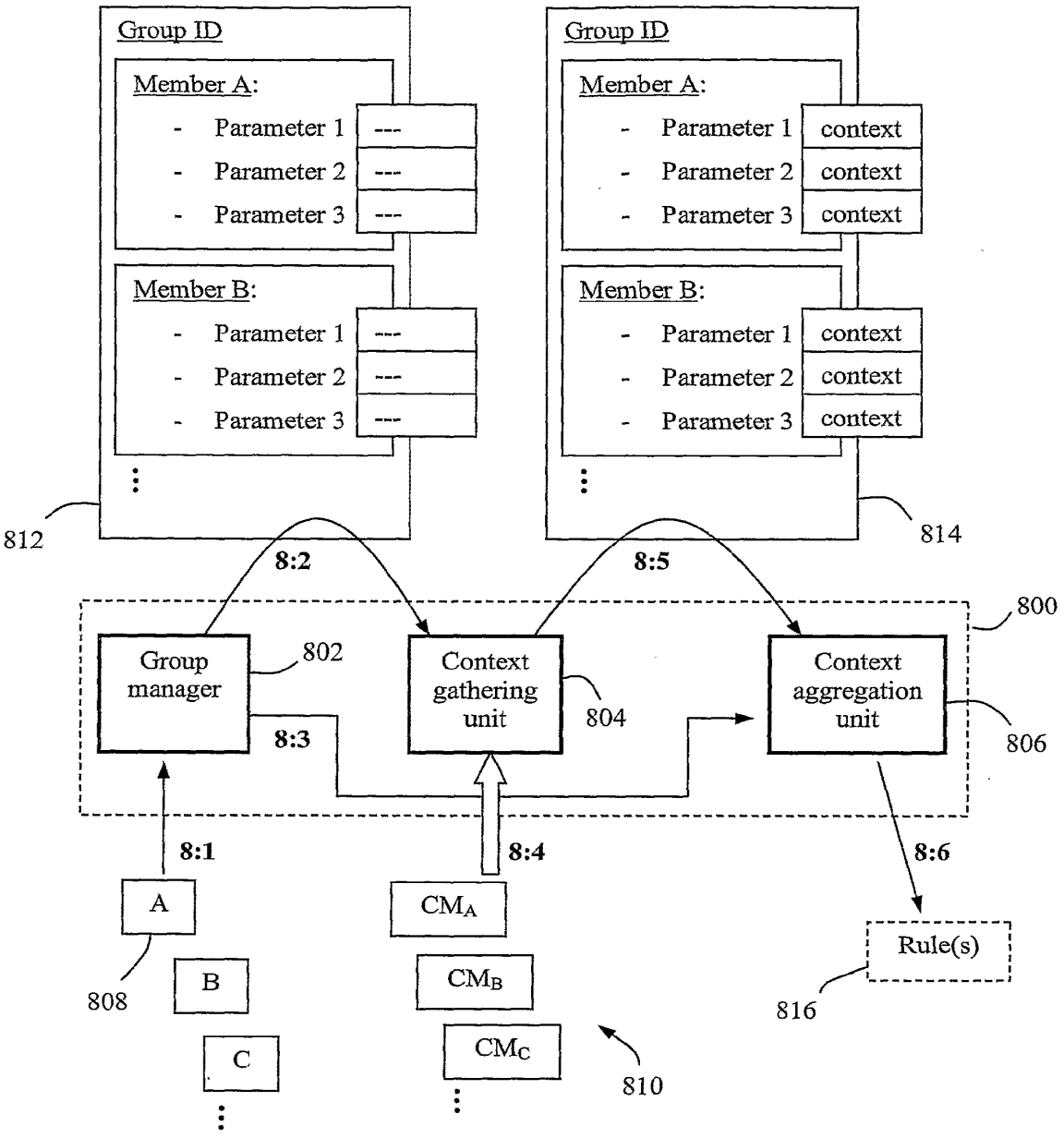


Fig. 8

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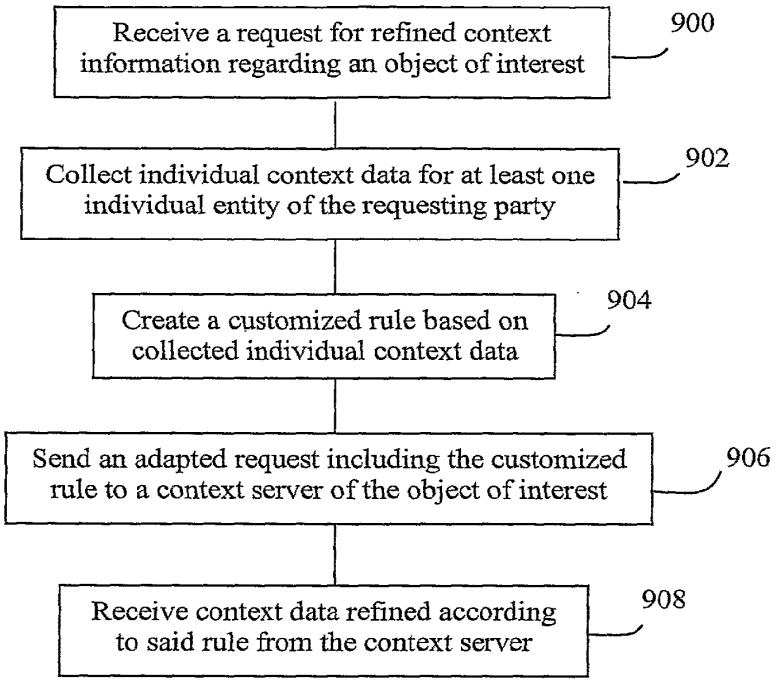


Fig. 9

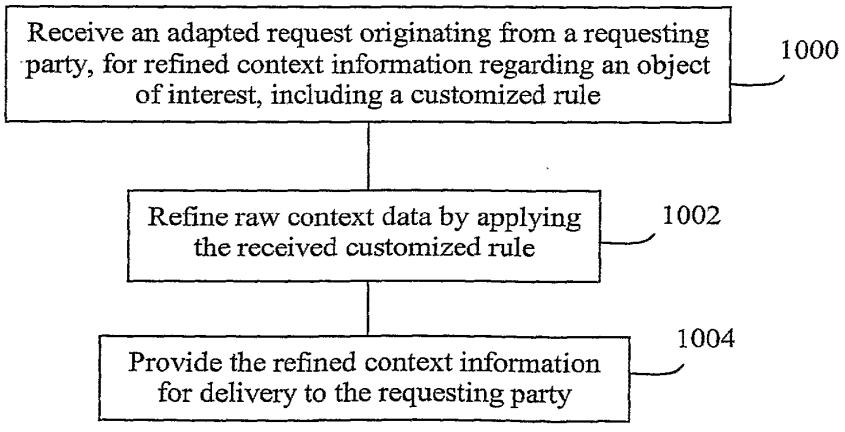


Fig. 10

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/SE2005/001461

A. CLASSIFICATION OF SUBJECT MATTER
H04L29/08

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)
H04L

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, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2004/122977 A1 (MORAN TIMOTHY L ET AL) 24 June 2004 (2004-06-24) abstract paragraph '0029! - paragraph '0045! paragraph '0057! - paragraph '0076!	1,2,9, 10,17,19 3-8, 11-16, 18,20
Y	WO 01/45342 A (NORTEL NETWORKS LIMITED; DAVIES, ELWYN, B) 21 June 2001 (2001-06-21) abstract page 14, line 9 - page 18, line 23 page 21, line 18 - page 24, line 18	3,11,18, 20
	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"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)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 January 2006	19/01/2006

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Peeters, D

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/SE2005/001461

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 2004/122896 A1 (GOURRAUD CHRISTOPHE) 24 June 2004 (2004-06-24) abstract paragraph '0001! - paragraph '0012! paragraph '0059! - paragraph '0062!	3,11,18, 20

Form PCT/ISA/210 (continuation of second sheet) (January 2004)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/SE2005/001461

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審査請求　有　　予備審査請求　有　（全 25 頁）　最終頁に続く

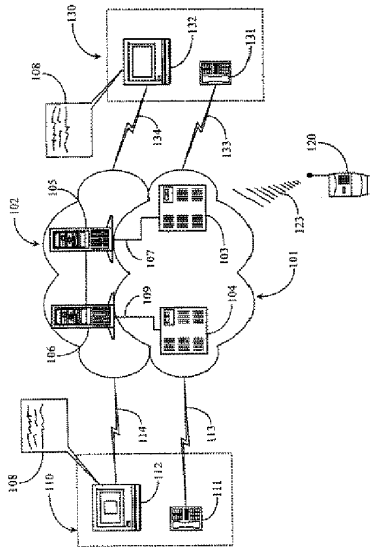
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(54)【発明の名称】　リアルタイムインターラクティブディレクトリ

(57)【要約】
【解決手段】　接続されたビデオモニタ（１３２）を有し、ネットワークアクセスに対して適合されたワークステーション（１１０）に対して提供されるインターラクティブディレクトリ（図２）は、人および組織である個々のエンティティに対するステータスを表示するインターラクティブディスプレイを持っている。エンティティは各エンティティに対するステータス（図２）とともにディスプレイ中にリストアップされている。ステータスに対して複数のフィールドがあってもよく、いくつかのフィールドが電話番号を表示する一方、他のフィールドは英数字の表示（図２）を提供する。遠隔コンタクトアドレスが記憶され、各ディレクトリエンティティと関係付けられ、ディレクトリがアクティブであるときには、ワークステーション（１１０）は個々のディレクトリリストに関係するネットワーク情報源からのステータス情報にアクセスする。



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【特許請求の範囲】

【請求項１】　インターラクティブディレクトリシステムにおいて、

ワークステーションにおけるビデオモニタ上に表示可能であり、少なくとも１つのディレクトリエンティティとそのエンティティに対するステータスを表示するユーザインターフェイスと、

ディレクトリエンティティに対するステータス情報を持つコンピュータに対するコンタクトアドレスとを具備し、

ディレクトリシステムはコンタクトアドレスにおけるコンピュータにコンタクトし、ディレクトリエンティティに対するステータス情報にアクセスし、ディレクトリエンティティに対する更新されたステータス情報をインターラクティブディレクトリ中に表示するインターラクティブディレクトリシステム。

【請求項２】　表示されるステータス情報にはディレクトリエンティティに対する少なくとも１つの電話番号が含まれている請求項１記載のディレクトリシステム。

【請求項３】　ステータス情報に対してコンタクトされたコンピュータは、インターラクティブディレクトリが実行されるのと同じコンピュータである請求項１記載のディレクトリシステム。

【請求項４】　コンタクトされたコンピュータは統計サーバ（スタットサーバ）である請求項１記載のディレクトリシステム。

【請求項５】　スタットサーバがコールセンターシステム中にある請求項４記載のディレクトリシステム。

【請求項６】　コンピュータはインターネット上のワークステーションである請求項１記載のディレクトリシステム。

【請求項７】　コンピュータはインターネット接続されたサーバであり、電話ネットワークに接続された電話スイッチへのＣＴＩリンクにより接続されたＣＴＩサーバでもある請求項１記載のディレクトリシステム。

【請求項８】　電話ネットワークは公衆電話交換ネットワーク（ＰＳＴＮ）である請求項７記載のディレクトリシステム。

【請求項９】　複数のディレクトリエンティティがリストアップされ、リス

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トアップされている各ディレクトリエンティティに対する代替電話機と個人ステータスを表示するために各エンティティと関係する複数のフィールドが提供されている請求項１記載のディレクトリシステム。

【請求項１０】　電話フィールドの個々のものは特徴とともに電話番号を表示するように構成され、特徴はエンティティに関係する電話機のステータスを表している請求項９記載のディレクトリシステム。

【請求項１１】　特徴には、下線、グラフィック的なフィールドフィル、リバースビデオ、特定の色、チェックマーク、特定のフォント、太字、イタリック体、スキャンされた画像が含まれており、特定の特徴により表される電話ステータスには、話中、非話中、最良の番号、一時的な切断が含まれている請求項７記載のディレクトリシステム。

【請求項１２】　ディレクトリエンティティに関係し、ディレクトリエンティティに対する電話通話をユーザにより開始させるように適合されたインターラクティブ入力をさらに具備する請求項１記載のディレクトリシステム。

【請求項１３】　ディレクトリエンティティに関係するインターラクティブ入力をさらに具備し、インターラクティブ入力は個々の電話フィールドから電話通話を開始させるために提供され、通話は電話フィールド中の電話番号にかけられる請求項９記載のディレクトリシステム。

【請求項１４】　ワークステーションは次に電話ネットワークに接続されている電話機に接続され、電話通話は電話機をダイヤルするワークステーションにより開始される請求項１２記載のディレクトリシステム。

【請求項１５】　ネットワーク上で接続され、ローカル電話スイッチにも接続されているＣＴＩサーバにアクセスすることによりワークステーションは電話通話をかけ、ＣＴＩサーバはローカル電話スイッチによりエンティティへの電話をかけさせ、同じ通話をワークステーションに最も近い電話機に接続する請求項１２記載のディレクトリシステム。

【請求項１６】　個々のディレクトリエンティティに対する個々のコンタクトアドレスを具備し、ステータス更新は異なるコンピュータからリストアップされた異なるディレクトリエンティティに対してなされる請求項９記載のディレク

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トリシステム。

【請求項１７】　ディレクトリエンティティに関係する電話フィールド以外のステータスフィールドを具備し、ステータスフィールドは英数字表示に対して適合されている請求項１記載のディレクトリシステム。

【請求項１８】　電話フィールド以外のステータスフィールドは、１つ以上のバケーションステータス、１つ以上の一時的な電話番号、シフトステータス、異なる番号に変更するためのタイムステータス、およびビジネス旅行ステータスを表示するように構成されている請求項１７記載のディレクトリシステム。

【請求項１９】　個人と組織のエンティティのステータスを追跡する方法において、

（ａ）ワークステーションのビデオモニタ上にインターラクティブディレクトリを表示し、インターラクティブディレクトリはエンティティの識別子とステータスを提供し、

（ｂ）ディレクトリ中にリストアップされているエンティティに対するステータス情報を有するコンピュータにワークステーションをコンタクトさせ、コンピュータに対するコンタクトアドレスはワークステーションにおいて前もって記憶されて、エンティティに関係付けられ、

（ｃ）コンタクトアドレスに関係するエンティティに対するステータス情報をアクセスし、

（ｄ）アクセスされた情報を使用して、インターラクティブディレクトリ中のエンティティに対するステータスを更新および表示するステップを含む方法。

【請求項２０】　ステップ（ｄ）において表示されるステータス情報にはディレクトリエンティティに対する少なくとも１つの電話番号が含まれている請求項１９記載の方法。

【請求項２１】　ステップ（ｂ）においてステータス情報に対してコンタクトされたコンピュータは、インターラクティブディレクトリが実行されるのと同じコンピュータである請求項１９記載の方法。

【請求項２２】　ステップ（ｂ）においてコンタクトされたコンピュータは統計サーバ（スタットサーバ）である請求項１９記載の方法。

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【請求項２３】　スタットサーバがコールセンターシステム中にある請求項２２記載の方法。

【請求項２４】　ステップ（ｂ）においてコンタクトされたコンピュータはインターネット上のワークステーションである請求項１９記載の方法。

【請求項２５】　ステップ（ｂ）においてコンタクトされたコンピュータはインターネット接続されたサーバであり、電話ネットワークに接続された電話スイッチへのＣＴＩリンクにより接続されたＣＴＩサーバでもある請求項１９記載の方法。

【請求項２６】　電話ネットワークは公衆電話交換ネットワーク（ＰＳＴＮ）である請求項２５記載の方法。

【請求項２７】　複数のディレクトリエンティティがリストアップされ、リストアップされている各ディレクトリエンティティに対する代替電話機と個人ステータスを表示するために各エンティティと関係する複数のフィールドが提供されている請求項１９記載の方法。

【請求項２８】　電話フィールドの個々のものは特徴とともに電話番号を表示するように構成され、特徴はエンティティに関係する電話機のステータスを表している請求項２７記載の方法。

【請求項２９】　特徴には、下線、グラフィック的なフィールドフィル、リバースビデオ、特定の色、チェックマーク、特定のフォント、太字、イタリック体、スキャンされた画像が含まれており、特定の特徴により表される電話ステータスには、話中、非話中、最良の番号、一時的な切断が含まれている請求項２８記載の方法。

【請求項３０】　ディレクトリエンティティに関係し、ディレクトリエンティティに対する電話通話をかけるインターラクティブ入力を使用するステップをさらに含む請求項１９記載の方法。

【請求項３１】　ディレクトリエンティティに関係するインターラクティブ入力を使用して電話通話をかけるステップをさらに含み、インターラクティブ入力は個々の電話フィールドから電話通話を開始させるために提供され、通話は電話フィールド中の電話番号にかけられる請求項２７記載の方法。

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【請求項３２】　ワークステーションは次に電話ネットワークに接続されている電話機に接続され、電話通話は電話機をダイヤルするワークステーションにより開始される請求項３０記載の方法。

【請求項３３】　ネットワーク上で接続され、ローカル電話スイッチにも接続されているＣＴＩサーバにアクセスすることによりワークステーションは電話通話をかけ、ＣＴＩサーバはローカル電話スイッチによりエンティティへの電話をかけさせ、同じ通話をワークステーションに最も近い電話機に接続する請求項３１記載の方法。

【請求項３４】　個々のディレクトリエンティティに対する個々のコンタクトアドレスを具備し、ステータス更新は異なるコンピュータからリストアップされた異なるディレクトリエンティティに対してなされる請求項２７記載の方法。

【請求項３５】　ディレクトリエンティティに関係する電話フィールド以外のステータスフィールドを具備し、ステータスフィールドは英数字表示に対して適合されている請求項１９記載の方法。

【請求項３６】　電話フィールド以外のステータスフィールドは、１つ以上のバケーションステータス、１つ以上の一時的な電話番号、シフトステータス、異なる番号に変更するためのタイムステータス、およびビジネス旅行ステータスを表示するように構成されている請求項３５記載のシステム。

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【発明の詳細な説明】

【０００１】

【発明の属する技術分野】

この発明はコンピュータ統合テレフォニの分野に入り、特にユーザインターラクティブソフトウェアアプリケーションおよびシステムに関する。

【０００２】

【従来の技術】

現在多くの努力およびエネルギが電話関係のハードウェアおよびソフトウェアの開発に注がれていることはよく知られている。この開発はより良いそしてより速い通信に対する絶え間なく増加する要求により大きく動かされ、コンピュータ科学における進歩によりかなりの部分で可能にされている。電話技術では、例えば、公衆および専用ネットワーク中の電話スイッチを接続されたコンピュータにより機能拡張することが現在普通であり、これはコンピュータテレフォニ統合（ＣＴＩ）として知られており、接続されたコンピュータは電話トラフィックを監視および制御することに関連する多くの種類のＣＴＩアプリケーションを実行する。

【０００３】

多くの組織が現在コールセンターを使用しており、ここでは組織のエージェントが電話機とコンピュータステーションを備えたワークステーションを占有していることも技術的によく知られている。多くのケースでは、このようなコールセンター中のコンピュータステーションはローカルエリアネットワーク（ＬＡＮ）を通して相互接続されており、コールセンターのスイッチング装置に接続されたＣＴＩプロセッサも他のさまざまなサーバおよびプロセッサとともに同じＬＡＮ上に接続しているかもしれない。このようなシステムでは、ほとんど任意の組み合わせでインターネットおよびイントラネットが存在していてもよい。多くのこのような組み合わせはさまざまなネットワークリンクに関して可能である。

【０００４】

家庭ならびに小企業および大企業の両方における多くの個人は電話サービスとそれぞれのワークステーションにおけるパーソナルコンピュータのようなネット

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ワーク接続のコンピュータの両方を持つことも技術的によく知られている。インターネット接続されたコンピュータと電話機とを家庭に持つ人は世界中の何百万もの他の電話機およびコンピュータと少なくとも潜在的に接続されており、これには多くの会社を代理しているエージェントのステーションも含まれている。

【０００５】

先に説明した高度に相互接続されているコンピュータおよび電話機の世界では、多くの例においてリアルタイムステータス情報に対する要求が存在し、このような情報をアセンブルして提供する多くのシステムが発明者にそして技術的に知られている。例えば、コールセンターでは、次に電話スイッチング装置に接続されている、ＣＴＩサーバおよび／またはＣＴＩサーバにネットワーク接続されている他のサーバは、コールセンターのステータス（エージェントの利用可能性、電話機のオンフック、オフフックなど）を記録および更新する。このようなアクティビィティは、通話負荷およびルーティング決定の目的のためにアセンブルされて統計的に処理されることが多い。一般的にコールセンターでは、エージェントはシフトまたはセッションの始まりにログオンし、セッションの最後にログアウトする。コールセンターにおける内線番号に対する従業者に関係するデータなどが保持される。

【０００６】

他の例として、通話転送は多くのタイプの通話スイッチング装置のよく知られた機能であり、遠隔的な通話転送がなされる。さらに他の例として、今日ある技術が存在し、これにより、ネットワークにおいて、ネットワーク上でいつステーションがオンラインであるかが知られる。インターネットでは、オンラインおよびオフラインのステータスが共通サーバを通して関連ステーション間で信号送信される商業的に利用可能なシステムが存在しており、このシステムはいつ加入者がオンラインに来たかを検出し、そのステータスを他の加入者に報告する。

【０００７】

世界中の電話装置およびコンピュータ装置の既存のすべての相互接続性とともに、なされているすべてのステータスおよび統計的監視報告によって、相互接続されているシステムに対して情報を効率的に共有することは、本発明者の知識に

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よれば、ほとんどなされていない。

【０００８】

【発明が解決しようとする課題】

明らかに必要とされているものは、ステータス情報を発見し、これにアクセスし、これを使用するように適合されたインターラクティブディレクトリシステムである。

【０００９】

【課題を解決するための手段】

本発明の好ましい実施形態では、インターラクティブディレクトリシステムが提供され、このシステムはワークステーションにおけるビデオモニタ上に表示可能であり、少なくとも１つのディレクトリエンティティとそのエンティティに対するステータスを表示するユーザインターフェイスを具備し、またこのシステムはディレクトリエンティティに対するステータス情報を持つコンピュータに対するコンタクトアドレスとを具備する。ディレクトリシステムはコンタクトアドレスにおけるコンピュータにコンタクトし、人および組織に対するステータス情報にアクセスし、ディレクトリエンティティに対する更新されたステータス情報をインターラクティブディレクトリ中に表示する。表示されるステータス情報にはディレクトリエンティティに対する少なくとも１つの電話番号が含まれていてもよい。いくつかの実施形態では、ステータス情報に対してコンタクトされたコンピュータは、インターラクティブディレクトリが実行されるのと同じコンピュータである。いくつかの実施形態では、コンタクトされたコンピュータは統計サーバ（スタットサーバ）である。スタットサーバがコールセンターシステム中にあってもよい。また、コンピュータはインターネット上のワークステーションであってもよく、またこれに限定されないが公衆電話交換ネットワーク（ＰＳＴＮ）のような電話ネットワークに接続された電話スイッチへのＣＴＩリンクにより接続されたＣＴＩサーバであってもよい。

【００１０】

いくつかの実施形態では、複数のディレクトリエンティティがリストアップされ、リストアップされている各ディレクトリエンティティに対する代替電話機と

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個人ステータスを表示するために各エンティティと関係する複数のフィールドが提供される。電話フィールドの個々のものは特徴とともに電話番号を表示するように構成されていてもよく、特徴はエンティティに関係する電話機のステータスを表していてもよい。いくつかの実施形態では、特徴には、下線、グラフィック的なフィールドフィル、リバースビデオ、特定の色、チェックマーク、特定のフォント、太字、イタリック体、スキャンされた画像が含まれており、特定の特徴により表される電話ステータスには、話中、非話中、最良の番号、一時的な切断が含まれている。

【００１１】

本発明のいくつかの実施形態では、ディレクトリエンティティに関係し、ディレクトリエンティティに対する電話通話をユーザにより開始させるように適合されたインターラクティブ入力が提供される。複数のエンティティを有するこれらの実施形態では、ディレクトリエンティティに関係する複数のインターラクティブ入力が存在し、インターラクティブ入力は個々の電話フィールドから電話通話を開始させるために提供され、通話は電話フィールド中の電話番号にかけられる。

【００１２】

ある例においてユーザ入力により電話をかけるために、ワークステーションは次に電話ネットワークに接続されている電話機に接続され、電話通話は電話機をダイヤルするワークステーションにより開始される。他の例では、ネットワーク上で接続され、ローカル電話スイッチにも接続されているＣＴＩサーバにアクセスすることによりワークステーションは電話通話をかけ、ＣＴＩサーバはローカル電話スイッチによりエンティティへの電話をかけさせ、同じ通話をワークステーションに最も近い電話機に接続する。

【００１３】

本発明の実施形態では、異なるエンティティに対するステータス情報を同じ場所に維持する必要はない。個々のエンティティに対するステータスは例えば各エンティティに対して異なるコンピュータに維持してもよく、コンタクトアドレスはワークステーションにおいてディレクトリエンティティのそれぞれと関係付け

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られる。

【００１４】

さまざまな実施形態では、エンティティに対するステータスを表示する英数字表示を有するステータスフィールドが提供される。フィールドは、例えば１つ以上のバケーションステータス、１つ以上の一時的な電話番号、シフトステータス、異なる番号に変更するためのタイムステータス、およびビジネス旅行ステータスを表示するために使用してもよい。

【００１５】

本発明のさまざまな実施形態におけるインターラクティブディレクトリは、エンティティの情報が常に最新であり有用であるような方法で人および組織のエンティティのステータスを追跡する方法を初めて提供し、手入力により苦労して更新する必要はない。本発明を多くの可能な実施形態で以下に説明する。

【００１６】

【発明の実施の形態】

図１は本発明の実施形態にしたがったＣＴＩ機能拡張された環境の全体図である。雲１０１により表されている公衆電話交換ネットワーク（ＰＳＴＮ）には、第１の電話スイッチ１０４と第２の電話スイッチ１０３が含まれている。これらの２つのスイッチは、任意のＰＳＴＮ中に存在するさまざまなタイプの非常に多くのスイッチの単なる例示に過ぎないことは当業者に明らかであろう。ＰＳＴＮ１０１は専用電話ネットワークまたは、これに限定されないが、インターネットプロトコル電話ネットワーク（ＩＰＴＮ）のようなものを含む、技術的に知られている他の任意のタイプの電話ネットワークであってもよい。

【００１７】

雲１０２により表されているワイドエリアネットワーク（ＷＡＮ）はインターネットまたは１以上の会社により共有されている大規模なイントラネットであってもよい。ＷＡＮ１０２はイントラネットとインターネットの組み合わせであってもよい。先に説明したように非常に多くの可能性ある代替物が存在する。この例の目的のために、雲１０２はインターネットとして知られているワイドエリアネットワークを表している。

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【００１８】

インターネット１０２は範囲が非常に広く、家庭、小企業および大企業の非常に多くの個人への、そして政府のエンティティを含む種々の組織へのインターネットアクセスおよび接続性を提供する多くのサイトの装置に対する接続を含む。

【００１９】

インターネット１０２に対するアクセスは、インターネットサービスプロバイダ（ＩＳＰ）に対するダイヤルアップ接続によるような技術的に知られているさまざまな方法により提供される。一般的にインターネット１０２に対するアクセスを有する個人は、プロバイダアクセスに対する電話接続のためのモデムを備えたコンピュータ（ＰＣ）と従来の電話ネットワークアクセスのための電話機とを持っている。コンピュータは専用回線により取り扱われてもよい場合があり、いくつかの例では、単一の回線が電話機とコンピュータモデムに対して（排他的に）共有される。

【００２０】

図１の実施形態では、２つのワークステーション１１０および１３０が示されており、両方ともＰＳＴＮ１０１およびインターネット１０２に接続されている。ワークステーション１１０は、リンク１１４を通してインターネット１０２に接続されているＰＣ１１２を備えている。リンク１１４は、アナログ、統合サービスデジタルネットワーク（ＩＳＤＮ）のようなデジタル、あるいは技術的に知られている任意の他の適切な接続の形態であってもよい。このケースでは、インターネット１０２に対するアクセスはＩＳＰへのダイヤルアップ接続を通して達成される。ワークステーション１１０は、単純な古い電話サービス（ＰＯＴＳ）回線１１３を通してＰＳＴＮ１０１に接続されている電話機１１１も備えている。ワークステーション１３０はリンク１３４を通してインターネット１０２に接続されているＰＣ１３２と、ＰＯＴＳ回線１３３を通してＰＳＴＮ１０１に接続されている電話機１３１を備えている。

【００２１】

ワークステーション１３０中に存在している構成部品は、本発明の精神および範囲を逸脱することなく、ワークステーション１１０中に存在している構成部品

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から変化させてもよい。例えば、いずれかのワークステーションが付加的な電話回線およびまたはファックスマシーンのような技術的に知られている他の装置、付加的なＰＣなどを持っていてもよい。この実施形態では、ワークステーション１１０に示されている構成要素は、例示目的のためだけにワークステーション１３０に示されている構成要素と同一である。先に説明したような移動体である個人のケースでは、インターネット１０２に対するアクセスはモデム接続を有するラップトップコンピュータを通して、あるいはインターネットアクセス能力を持つセルラ電話機などから達成してもよい。

【００２２】

電話スイッチ１０４は、ステーション１１０に対してローカルなＰＳＴＮ中のスイッチであり、ＣＴＩリンク１０９によりスイッチに接続されたＣＴＩサーバ１０６によりＣＴＩ機能拡張されたスイッチである。サーバ１０６はインターネット接続されており、サーバがインターネット雲中に示されている事実によりこれは図中で暗示されている。ＣＴＩサーバ１０５もインターネット接続されており、ＣＴＩリンク１０７を通して電話スイッチ１０３に接続されている。ＣＴＩサーバ１０６および１０５は技術的に知られているようなネットワーク接続を通して相互に接続されていてもよく、少なくともインターネットを通して接続されている。電話スイッチ１０４および１０３もＰＳＴＮ雲中に示されていることにより相互に接続されている。他の多くの接続状況があり、示すことができる他の多くの装置が存在することは当業者に明らかであろう。本発明者は本発明の好ましい実施形態を図示するためにはここに示されている図で十分であると考える。

【００２３】

先に説明したように、装置のリアルタイムステータスが監視され、利用可能性などについての情報が記憶されている、高度に相互接続されたコンピュータおよび電話の世界には多くの例が存在している。図１の例では、インターネット接続されたＣＴＩサーバ１０５はスイッチ１０３のアクティビィティを監視し、ステーション１３０における電話機１３１のステータス（とともに、スイッチ１０３を通して接続されている他の多くの電話機のステータス）を追跡してもよい。サーバ１０５は回線１３３が話中または利用可能であるときなどのリアルタイム情

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報を常に持っている。

【００２４】

ステーション１１０では、ＰＣ１１２はリンク１１４を通してインターネットに接続されていてもよい。ＰＣ１１２はそのようにする所定のプロトコル（ＵＲＬなど）によりサーバ１０５に接続し、サーバ１０５上で実行されるＣＴＩアプリケーションを通して提供されてもよい許可により、ステーション１３０の電話機１３１のステータスにアクセスしてもよい。

【００２５】

本発明の好ましい実施形態では、リアルタイムインターラクティブディレクトリ（ＲＴＩＤ）アプリケーション１０８が提供され、ステーション１１０のＰＣ１１２上で実行される。ＲＴＩＤ１０８はＰＣ１１２のディスプレイ上にインターラクティブインターフェイスを提供するシステムであり、これはエンティティとして人々と組織、各人に到達する電話アクセス番号、人と番号のステータスをリストアップする。この実施形態では、エンティティの識別子およびステータスはよく知られた表示フィールドに中にあるが、技術的によく知られているように、特定のフィールド以外に表示することもできる。

【００２６】

図２はＲＴＩＤ１０８に対する例示的なインターラクティブインターフェイスであり、ジョンドゥ、ジェーンドゥおよびダフダックの人エンティティに対するアクセスとステータスを示している。８つの列が示されており、姓、名、第１の電話番号、第２の電話番号、自宅番号、移動体番号＃１、移動体番号＃２およびステータスが提供されている。さらに多くの項目を示してもよく、またよく知られた構成技術を使用して、どの項目を表示させるか、ホットキーの使用によりまたはスクロールすることによるなどのような付加的な機能によりどの項目を利用可能にするかをユーザが選択できるようにしてもよいことは当業者に明らかであろう。

【００２７】

この実施形態では、ＰＣ１１２がインターネットに接続されていない間にディレクトリがステーション１１０においてアクセスされてもよく、その場合には、

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静的なディレクトリとして機能する。しかしながらＲＴＩＤ１０８はネットワーク接続、このケースではインターネットを通して相互対話して、リアルタイムステータスを集めて表示し、いくつかの実施形態では以下でさらに詳細に説明するように、他の何らかの電話機能を実行するように構成されることが好ましい。

【００２８】

図２を参照すると、ＰＣ１１０上で実行されるＲＴＩＤアプリケーション１０８により提供されるインターラクティブウインドウが示されている。ステーションのユーザは表示されているリストから例えばジョンドゥのような名前を選択する。ＲＴＩＤはルックアップ機能を持ち、ジョンドゥに対するリアルタイム情報の遠隔情報源を提供し、このケースではサーバ１０５上で実行されているＣＴＩアプリケーションである。ＲＴＩＤはインターネットを通してＣＴＩサーバ１０５にアクセスし、ジョンドゥのステータス情報に対するアクセスについて交渉する。アクセスが許可されたとき、ジョンドゥのステータス情報はインターネットを通してステーション１１０のＰＣ１１２に送られ、ジョンドゥにおける情報行が直ちに更新される。

【００２９】

サーバ１０５において利用可能なジョンドゥに対する情報は、電話機１３１が話中か空いているかのような簡単なものであってもよい。しかしながら、さらに複雑な利用可能な情報が存在していてもよい。いくつかの実施形態では、さまざまな情報でそしてさまざまな方法でサーバ１０５を更新するために、ジョンドゥに対して提供される機構が存在していてもよい。例えばジョンドゥは自分のステータスを呼び出し、しばらくの間は一時的な番号で利用可能であることを示し、通話転送を開始し、これはステータス情報としてサーバ１０５上に記憶され、またジョンドゥは電話番号を更新などする。ジョンドゥはこのようなデータ更新を実行してもよく、これはサーバ１０５がスイッチ１０３、そしてネットワーク中の他のスイッチやサーバさえ通して収集するリアルタイム監視情報に対して付加的なものである。ジョンドゥはまたＲＴＩＤ１０８のインスタンスを実行している自分のＰＣ１３０を通して情報を更新し、ＲＴＩＤ１０８はこの例では、データフィールドを有する入力インターフェイスを提供し、ジョンドゥに対してリス

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トアップされた記憶位置に新しい情報を送るように構成されている。ジョンドゥはセルラ電話機１２０を使用して更新されたステータスを呼び出し、通話転送などを遠隔制御してもよい。

【００３０】

この教示を提供すると、ステータス情報を獲得して記憶させる多くの方法が存在することは当業者に明らかであろう。他の例と同様に、ジョンドゥに対するステータス情報はおそらくスイッチ１０３から離れたインターネット中のサーバ上に維持してもよく、サーバ１０５はジョンドゥの電話としてリストアップされた電話のステータスを定期的にそのサーバに報告してもよい。インターネットおよび公衆および専用電話交換ネットワークを含む他のネットワークの相互接続性が与えられた場合、ジョンドゥおよび彼の装置についてのステータス情報を維持する非常に幅広いさまざまな方法が存在することは当業者に明らかであろう。

【００３１】

ステーション１１０のＰＣ１１２に戻ると、ジョンドゥの情報がリリースされると、インターラクティブインターフェイス中のフィールドは直ちに更新される。情報をステーション１１０のユーザに表示する幅広いさまざまな方法が存在する。図２では、ジョンドゥの情報が更新されて、ジョンドゥは話中（列８中の文字テキスト）であること示されており、ジョンドゥは（反転されたビデオ表示として示されている）彼の第１の回線で話中であることが示されている。他の情報も同様に示されてもよい。例えばジョンドゥが通話に対して利用可能であることをステータスチェックが示す場合には、通話に対して適切なジョンドゥの電話機が下線、色、番号を囲むボックス、他の多くの方法などにより示される。

【００３２】

いくつかの実施形態では、小さな文字またはアイコンが対象となる人を表し、人々のスキャン読み取りされた絵さえ使用することができ、位置、色、ハローなどを変化させることによりステータスを示す。

【００３３】

いくつかの実施形態では、ＰＣ１１２がインターネット接続されている間中、ＲＴＩＤ１０８のディスプレイ中に示されているすべての行が更新され、ユーザ

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がスクロールすると、新しい行も更新される。異なるエンティティに対する開始は、本発明の精神および範囲を逸脱することなくさまざまな方法で行ってもよい。

【００３４】

先の従来技術のセクションにおいてコールセンターを説明したが、ここでは一般的に営利目的の会社である組織が、電話スイッチング装置に接続された電話機を少なくとも有するワークステーションにおいてエージェントを維持する。多くのこのようなシステムでは、電話ネットワーク中にサービス制御ポイントを有する分散コールセンターが存在する。このようなシステム中のスイッチはＣＴＩサーバにより機能拡張されているものとして知られており、エージェントステータスは通話のルーティングのようなコールセンターシステムの動作目的のためにスタットサーバにより維持されることが非常に多い。このようなシステムは先にそしてこの特許出願中の他の部分で説明したＲＴＩＤシステムとともに動作するように構成することができる。

【００３５】

図２の例に特に示されていないが、タイムゾーン、バケーションの一時的な番号、通話するのに最良の時間、出かけるが戻って来るなどのような付加的な情報を示してもよい。先に説明したようなＲＴＩＤアプリケーションは、電話をかけること、Ｅメールを送信すること、転送された番号にアクセスするために電話スイッチのセントレックス機能を使用することになどに関して、インターラクティブであってもよい。例えば、インターラクティブリスト上の名前と通信しようとしているステーション１１０のユーザは、リストが利用可能であること、そしてコンタクトするにはどの番号が最良であるかの表示を見ると、電話機に手を伸ばして選択された番号をダイヤルすることによってではなく、ＲＴＩＤへの入力により電話をかけてもよい。このようなダイヤラは発明者に知られており、ステーション１１０の装置と統合してもよい。

【００３６】

ユーザがジェーンドゥにコンタクトしたくてＲＴＩＤリスト中の彼女の名前を選択した場合には、行Ｃ中インターラクティブ表示が更新される。この例では、

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ジェーンドゥは利用可能ではない。その理由は彼女はバケーション中（Ｃ８）だからである。いくつかの実施形態では、フィールドＣ８を選択することにより、戻って来る日付のような付加的な情報を含む付加的なフィールドが現れてもよい。ジェーンドゥのステーションにおいて彼女の後任になる個人がいる場合には、その個人の名前がフィールドＣ２およびＣ１に現れてもよい。ダフダックのケース（行Ｄ）では、彼が旅行中であることから彼の転送番号が旅程に加えられている。

【００３７】

所望されたコンタクトに対してユーザにより実際の電話がかけられるときには、通話を接続するためにいくつかの異なる方法を使用することができる。例えば、ユーザによりクリックされた番号がインターネット電話の場合には、通話はインターネットを通してルーティングされ、呼び出しアイコンとして宛先ＰＣ上に現れる。ユーザのＲＴＩＤアプリケーション内のフィールドは、所望されたインターネット電話番号がアクティブである（ターゲットコンピュータがインターネット接続されている）こと、そしてその番号が使用中でないことを反映する。１つの実施形態では、ユーザは独立した電話機を使用して、ダフダックに対して示されている旅行番号のような旅程中に残された転送番号を呼ぶ。

【００３８】

他の実施形態では、ＲＴＩＤは、会社のすべての従業者に対して、会社の電話装置のすべてを含む多国籍会社により実現され、インターネットを通して同期化されたディレクトリとすることができる。さらに他の実施形態では、本発明にしたがったシステムは家族に対して、そしておそらくは近い友人に対して実現されてもよく、すべてのデータはローカル電話会社スイッチに接続されたサーバに記憶させてもよい。家族の異なるメンバーに割り当てられたセル電話機とともに、一時的な位置などを表示させることができる。このようなローカル家族システムは、互いに追跡し合い、最高のコミュニケーションを維持する家族のメンバーにとって非常に有用である。

【００３９】

本発明の実施形態では、アクセスセキュリティのレベルを実現してもよい。例

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えば、１人のアソシエートは旅程と他のアソシエートのアクティブ状態に対してパスワードを通してフルアクセスを持ってもよく、他のアソシエートはあるアクティブ状態に対してのみアクセスを持つが旅程などに対してはアクセスを持たなくてもよい。暗号化、パスワードなどのような技術的に知られているさまざまなセキュリティ技術を使用することができる。

【００４０】

本発明のＲＴＩＤアプリケーションは、本発明の精神および範囲を逸脱することなく、既存のルーティングアプリケーションおよびステータス報告ソフトウェアとインターフェイスさせることができることは当業者に明らかであろう。例えば、ＲＴＩＤをエージェント報告ソフトウェアとインターフェイスさせて、ユーザに対してトランスペアレントにする代わりに、ユーザに対して見えるようにしてエージェントのリアルタイムステータス報告の方法を機能拡張してもよい。さらなる機能拡張は、ユーザがＰＣからＲＴＩＤインターフェイスを使用して通信を開始できるようにすることにより提供される。

【００４１】

多くの情報項目と多くの種類の情報が存在し、先の実施形態に示されていないが本発明の精神および範囲に入ることが明らかである本発明の実施形態にしたがってこれらの情報がアクセスされてリアルタイムインターラクティブディレクトリ上に表示されることも当業者にさらに明らかになるであろう。例えば、ディレクトリは呼ばれた人の電子スケジュール（３時まで会議中－コールバックを予約しますか？）、その人は今日既に電話機を使用したという事実、その人はある期間に対して電話機を使用していないという事実、その人は内部の同僚あるいは外部の同僚と話していて話中であるという事実、呼ばれた人は特定の人あるいは特定の番号と話しているという事実、その人は緊急通話のみを受けているという事実、その人は限られたリストのみからの通話を受けているという事実、その人は応答しなかったという（彼をページング呼び出ししますか？）事実を示してもよい。

【００４２】

さらにディレクトリはタイムゾーンインジケータ、オフデューティインジケー

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タ、あるいはスリープ期間インジケータを含んでいてもよい。他の表示は、この人は今日Ｅメール／電話機／ファックス／ＶＯＮにより通信することを好むなどとすることができる。ディレクトリは呼ばれた当事者に関係する他の人々についての情報を付加的に示してもよい。

【００４３】

この人の以下のチームメートは以下のステータスを持つ。

リチャード・ピカリングー管理スタッフー西部領域販売－外部通話で話中

グレッグ・ジョンストンー同僚－中央領域販売－自由

ブルース・ランヤンーラインマネージャー自由

発呼者／質問者に対してカスタマイズされた、呼ばれた当事者から返される以下のようなメッセージがあってもよい。

貴方からの通話を受け取った／貴方と話すことを熱望している、あるいは

この人はテレビ電話／基本音声より上で貴方のものと互換性がある電話オプションを持っている。

【００４４】

他の例では、システムはチームの同僚のステータスを永久的に表示し、いつ状態が変化したか（例えば電話機が次に使用されたときあるいは非緊急通話を受け入れたとき）を知らせるように構成可能である。他の特徴はコールバック要求を通して電話機への次の通話を予約することであってもよい。いくつかの実施形態では、開始者あるいは終了者のスイッチ以外のスイッチにより通話をセットアップしてもよい。システムはローミングしている間に（例えば移動電話機データから）呼び出された人の地理的位置を示し、そして／またはＩＰ電話機のステータスを（非ＩＰ電話機ユーザに）提供するように構成してもよい。他の多くの構成およびサービスは本発明の精神および範囲を逸脱することなく当業者に明らかであろう。

【００４５】

ユーザＰＣ上で実行されているＲＴＩＤアプリケーションインターフェイスをユーザに対してフレンドリーであるさまざまな構成で表現することができることも当業者に明らかであろう。例えば、アイコンを使用してコンタクト、場所、イ

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ベントなどを表してもよい。色背景を変化させること使用して、重要な情報や現在のステータス状態を強調してもよい。例えば、話中の電話番号を赤で強調する一方、試みられた通話は青などの強調にしてもよい。さらに、ネットワーク中で利用される多くの付加的な通信状態を、テレビ会議、テレビ電話、Ｅメールおよび他の既知のプログラムに関係するマルチメディアアプリケーションのような本発明のＲＴＩＤアプリケーションに組み込むことができる。可能な他の多くの実施形態が存在し、その多くは先に既に説明した。本発明は特許請求の範囲によってのみ限定される。

【図面の簡単な説明】

【図１】

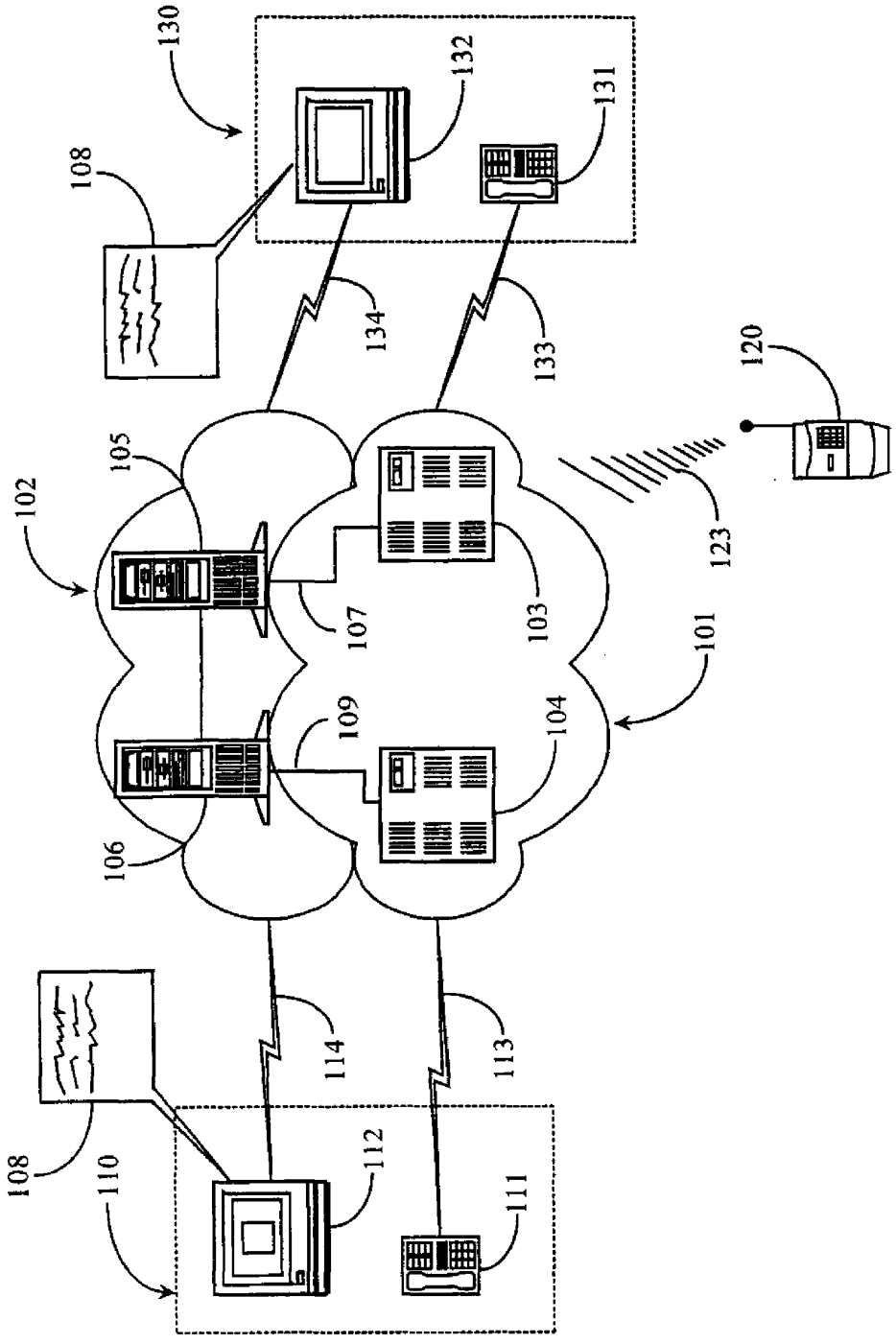
図１は、本発明の実施形態にしたがったＣＴＩ機能拡張されたコンピューター電話環境のかなり概略的な全体図である。

【図２】

図２は、本発明の実施形態にしたがったコンピュータプラットフォーム上で実行されるリアルタイムインターラクティブディレクトリに対するインターラクティブインターフェイスの例示的な図である。

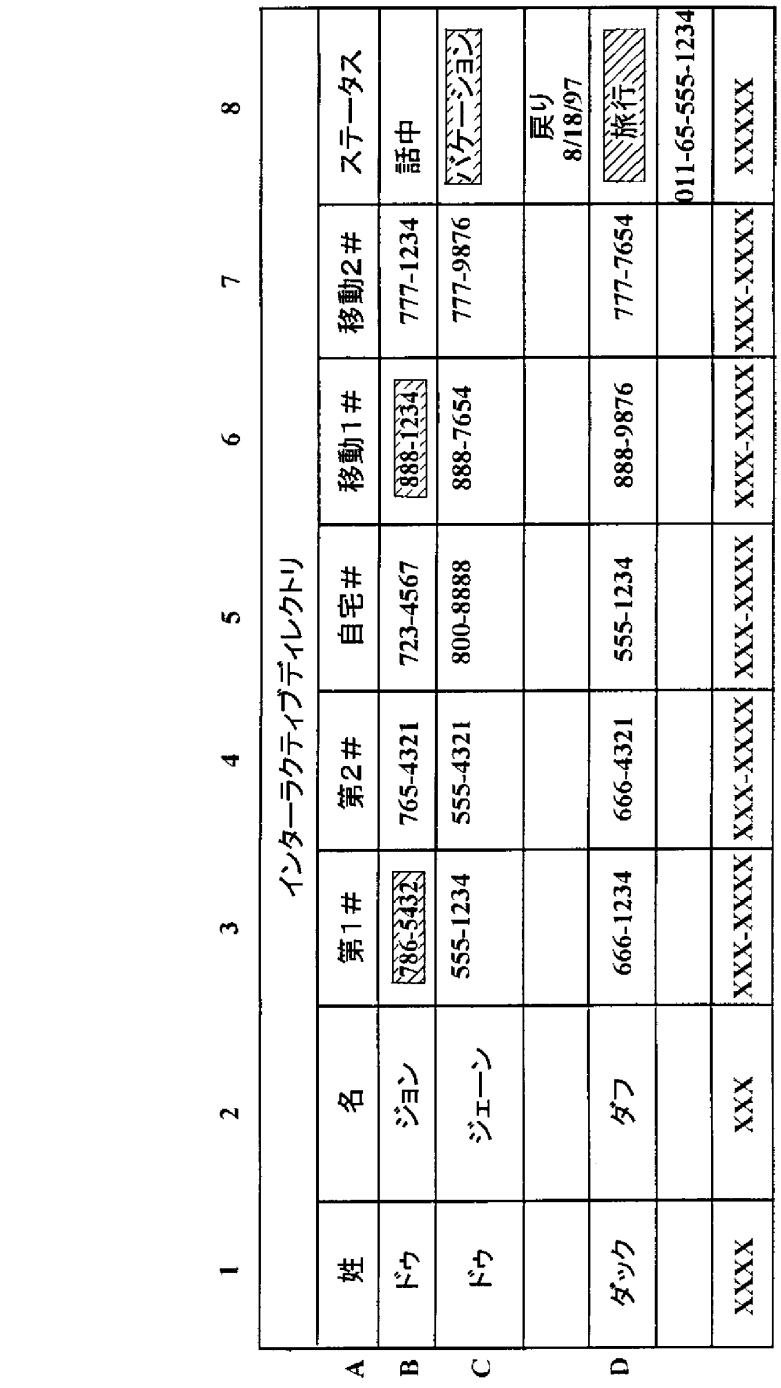
Petitioner Samsung Ex-1004, 0449

【図１】



Petitioner Samsung Ex-1004, 0450

【図２】



	1	2	3	4	5	6	7	8
	インターラクティブディレクトリ							
A	姓	名	第１#	第２#	自宅#	移動１#	移動２#	ステータス
B	ドゥ	ジョン	786-3432	765-4321	723-4567	888-1234	777-1234	話中
C	ドゥ	ジェーン	555-1234	555-4321	800-8888	888-7654	777-9876	バケーション
								戻り 8/18/97
D	ダック	ダフ	666-1234	666-4321	555-1234	888-9876	777-7654	旅行
								011-65-555-1234
	XXXX	XXX	XXX-XXXX	XXX-XXXX	XXX-XXXX	XXX-XXXX	XXX-XXXX	XXXXX

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【国際調査報告】

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/22415

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :H04Q 7/20, 3/64; H04M 1/64, 3/42
US CL :379/201, 67.1, 265; 455/461;
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)
U.S. : 379/201, 67.1, 265; 455/461;

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)
APS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,P	US 5,742,905 A (PEPE et al.) 21 April 1998, col. 36, lines 1-67, Figs. 28-45.	1-36
X,P	US 5,850,433 A (RONDEAU) 15 December 1998, col. 36, lines 1-67, Figs. 28-45.	1-36
X,P	5,757,904 A (ANDERSON) 26 May 1998, col. 3, lines 35-67, col. 4, lines 1-62.	7, 15, 25, 33

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents:	"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
"A"	document defining the general state of the art which is not considered to be of particular relevance	"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
"E"	earlier document published on or after the international filing date		
"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		
"P"	document published prior to the international filing date but later than the priority date claimed	"&"	document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 DECEMBER 1998	04 MAR 1999
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer CHARLES RONES James R. Matthews Telephone No. (703) 306-3030

Form PCT/ISA/210 (second sheet)(July 1992)*

Petitioner Samsung Ex-1004, 0452

フロントページの続き

(51)Int.Cl.'	識別記号	ＦＩ		テーマコード'(参考)
Ｈ０４Ｑ	3/64	Ｈ０４Ｑ	3/64	５Ｋ１０１
	7/20		7/04	

Ｆターム(参考) 5B075 ND20 PQ02
5K024 AA14 AA41 AA76 AA79 BB07
CC01 CC09 CC14 DD01 EE01
FF03 GG01 GG05 GG10 GG13
5K051 AA01 AA08 BB02 CC02 CC08
DD13 EE01 EE02 FF02 FF07
HH16 HH17 HH26 KK01
5K065 AA03 AA04 AA06 BA02 CA02
CA03 CA12 CA13 CA24 CB02
DA05 DA17 DA20 EA06 EA08
EA11
5K067 AA21 AA34 BB04 EE02 EE16
HH11
5K101 KK08 KK13 LL02 MM04 MM07
NN01 NN18 NN22 NN25 PP03
PP06 RR12 RR27 TT03 UU18

Petitioner Samsung Ex-1004, 0453

Electronic Patent Application Fee Transmittal

Application Number:	12567386
Filing Date:	25-Sep-2009
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Filer:	Christopher A. Singh
Attorney Docket Number:	P31880 / 45631-209480

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Petition fee- 37 CFR 1.17(h) (Group III)	1464	1	130	130
Request for continued examination	1801	1	930	930
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1060**

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

Decision Date : November 15, 2012

In re Application of :

Tobias Kohlenberg

DECISION ON PETITION
UNDER CFR 1.313(c)(2)

Application No : 12567386

Filed : 25-Sep-2009

Attorney Docket No : P31880 / 45631-209480

This is an electronic decision on the petition under 37 CFR 1.313(c)(2), filed November 15, 2012, to withdraw the above-identified application from issue after payment of the issue fee.

The petition is **GRANTED.**

The above-identified application is withdrawn from issue for consideration of a submission under 37 CFR 1.114 (request for continued examination). See 37 CFR 1.313(c)(2).

Petitioner is advised that the issue fee paid in this application cannot be refunded. If, however, this application is again allowed, petitioner may request that it be applied towards the issue fee required by the new Notice of Allowance.

Telephone inquiries concerning this decision should be directed to the Patent Electronic Business Center (EBC) at 866-217-9197.

This application file is being referred to Technology Center AU 2436 for processing of the request for continuing examination under 37 CFR 1.114 .

Office of Petitions

Electronic Acknowledgement Receipt

EFS ID:	14242452
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Christopher A. Singh
Filer Authorized By:	
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	15-NOV-2012
Filing Date:	25-SEP-2009
Time Stamp:	18:54:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1060
RAM confirmation Number	7310
Deposit Account	504238
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

1	Petition automatically granted by EFS	petition-request.pdf	31950 4cbac32dcd30f3caaf5f6f9093366e906828bf0b	no	2
Warnings:					
Information:					
2	Quick Path Information Disclosure Statement	P31880_QPIDSReq.pdf	73346 664aa0d0d47025c49deeb2e4a4526de3ecd1d734	no	2
Warnings:					
Information:					
3	Request for Continued Examination (RCE)	P31880_RCE.pdf	697870 57df62ed16c88a98f5d7415ed34913512ad79464	no	3
Warnings:					
Information:					
4	Information Disclosure Statement (IDS) Form (SB08)	P31880_SuppIDS.pdf	612610 ad485139404bcc0e693d712b05101835488ca4f5	no	4
Warnings:					
Information:					
5	Foreign Reference	FR1.pdf	1471197 3556279c3338888a818ed536eb4d4364b5afc6aa	no	31
Warnings:					
Information:					
6	Foreign Reference	FR2.pdf	2058134 508621d8f5f3ce4da8c0dc865f04279fde5ab880	no	48
Warnings:					
Information:					
7	Foreign Reference	FR3.pdf	712161 82b39c0d095b3a5b0d724e875acdb22e6035b00e	no	25
Warnings:					
Information:					
8	Non Patent Literature	NPL1.pdf	562037 43b440fde32d8f6ee9efe149130996b32f5403e3	no	7
Warnings:					
Information:					
9	Fee Worksheet (SB06)	fee-info.pdf	32310 f7a54c8fad27e836a062c3ad8d5cf3093f49a276	no	2
Warnings:					
Information:					

Total Files Size (in bytes):	6251615

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Doc Code: PET.AUTO Document Description: Petition automatically granted by EFS-Web	PTO/SB/140 U.S. Patent and Trademark Office Department of Commerce

Electronic Petition Request	**PETITION TO WITHDRAW AN APPLICATION FROM ISSUE AFTER PAYMENT OF THE ISSUE FEE UNDER 37 CFR 1.313(c)**
Application Number	12567386
Filing Date	25-Sep-2009
First Named Inventor	Tobias Kohlenberg
Art Unit	2436
Examiner Name	FIKREMARIAM YALEW
Attorney Docket Number	P31880 / 45631-209480
Title	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

An application may be withdrawn from issue for further action upon petition by the applicant. To request that the Office withdraw an application from issue, applicant must file a petition under this section including the fee set forth in § 1.17(h) and a showing of good and sufficient reasons why withdrawal of the application from issue is necessary.

APPLICANT HEREBY PETITIONS TO WITHDRAW THIS APPLICATION FROM ISSUE UNDER 37 CFR 1.313(c).

A grantable petition requires the following items:
(1) Petition fee; and
(2) One of the following reasons:
(a) Unpatentability of one or more claims, which must be accompanied by an unequivocal statement that one or more claims are unpatentable, an amendment to such claim or claims, and an explanation as to how the amendment causes such claim or claims to be patentable;
(b) Consideration of a request for continued examination in compliance with § 1.114 (for a utility or plant application only); or
(c) Express abandonment of the application. Such express abandonment may be in favor of a continuing application, but not a CPA under 37 CFR 1.53(d).

Petition Fee

☐ Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

☐ Applicant(s) status remains as SMALL ENTITY.

☒ Applicant(s) status remains as other than SMALL ENTITY

Reason for withdrawal from issue

◯ One or more claims are unpatentable ◉ Consideration of a request for continued examination (RCE) (List of Required Documents and Fees) ◯ Applicant hereby expressly abandons the instant application (any attorney/agent signing for this reason must have power of attorney pursuant to 37 CFR 1.32(b)).
RCE request,submission, and fee. ☐ I certify, in accordance with 37 CFR 1.4(d)(4) that : The RCE request ,submission, and fee have already been filed in the above-identified application on ☒ Are attached.
THIS PORTION MUST BE COMPLETED BY THE SIGNATORY OR SIGNATORIES I certify, in accordance with 37 CFR 1.4(d)(4) that I am: ◉ An attorney or agent registered to practice before the Patent and Trademark Office who has been given power of attorney in this application. ◯ An attorney or agent registered to practice before the Patent and Trademark Office, acting in a representative capacity. ◯ A sole inventor ◯ A joint inventor; I certify that I am authorized to sign this submission on behalf of all of the inventors ◯ A joint inventor; all of whom are signing this e-petition ◯ The assignee of record of the entire interest that has properly made itself of record pursuant to 37 CFR 3.71

Signature	/CHRISTOPHER A. SINGH/
Name	CHRISTOPHER A. SINGH
Registration Number	61236

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 12/05/2012

CSIAS1 SALE #00000006 Mailroom Dt: 11/15/2012 504238 12567386
01 FC : 1806 180.00 DA

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480

CONFIRMATION NO. 4223

73486
Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

POA ACCEPTANCE LETTER

OC000000057750060

Date Mailed: 11/28/2012

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 11/15/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/gbien-aime/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

Petitioner Samsung Ex-1004, 0463

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

PATENT WITHDRAWAL NOTICE

DATE WITHDRAWN	WITHDRAWAL NUMBER
11/20/2012	21603

The following application has been **WITHDRAWN** from the

12/4/2012 issue.

SERIAL NO.	PATENT NUMBER
12/567,386	8,327,416
DRAWINGS	**CLASS**
000	726/001

TITLE

METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER

NAME AND ADDRESS

TOBIAS M. KOHLENBERG, ET AL
PORTLAND, OR

REASON FOR WITHDRAWAL

Office of Petitions granted applicant's request to withdraw patent from issue.
AUTO-PETITION

APPROVED

/Kimberly Terrell/, Manager

Patent Publication Branch
Office of Data Management

FORM PTO-302 -- (REV. 05-2009)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/567,386	09/25/2009	Tobias M. Kohlenberg	P31880 / 45631-209480	4223

73486 7590 12/18/2012

Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

EXAMINER	
YALEW, FIKREMARIAM A	
ART UNIT	**PAPER NUMBER**
2436	
MAIL DATE	**DELIVERY MODE**
12/18/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Petitioner Samsung Ex-1004, 0465

Corrected Notice of Allowability	**Application No.** 12/567,386	**Applicant(s)** KOHLENBERG ET AL.	
	Examiner FIKREMARIAM A. YALEW	**Art Unit** 2436	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *IDS filed on 11/15/2012*.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are *1-25*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 11/15/2012
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/FIKREMARIAM A YALEW/ Primary Examiner, Art Unit 2436	12/14/2012

Petitioner Samsung Ex-1004, 0466

DETAILED ACTION

1. This correspondence is in response to **AMENDMENTS and REMARKS** filed on 07/23/2012.

2. The IDS filed on 11/15/2012 has been considered.

3. **Claims 1-25** are pending.

Response to Arguments

4. Applicant's arguments with respect to the rejection of the pending claims over prior arts of record have been fully considered and are persuasive. The rejections of Claims 1-25 have been withdrawn.

Allowable Subject Matter

5. **Claims 1-25** are allowed. No reason for allowance is needed as the record is clear in light of further search conducted, claim amendments and applicant's arguments filed on 07/23/2012.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fikremariam Yalew whose telephone number is 5712723852. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Philip Chea can be reached on 571-272-3951. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/FIKREMARIAM A YALEW/

Examiner, Art Unit 2436

12/13/2012

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12567386	KOHLENBERG ET AL.
	Examiner	Art Unit
	FIKREMARIAM A YALEW	2436

SEARCHED

Class	Subclass	Date	Examiner
726	1(including with text search)	12/13/2012	FA
726	2(inlcuding with text search)	12/13/2012	FA
713	$(including with text search)	12/13/2012	FA
380	$(including with text search)	12/13/2012	FA
455	$.ccls.(including with text search)	12/13/2012	FA
709	$.ccls.(including with text search)	12/13/2012	FA

SEARCH NOTES

Search Notes	Date	Examiner
Updated East search,NPL search(Google, patent, google scholar),Inventor search	12/13/2012	FA

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner
See	East search above	12/13/2012	FA

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	12567386
Filing Date	2009-09-25
First Named Inventor	Tobias M. Kohlenberg
Art Unit	2436
Examiner Name	Yalew, Fikremariam A.
Attorney Docket Number	P31880/45631-209480

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5960442	A	1999-09-28	Pickering	English equivalent of JP 2001-523074 below.

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1					

If you wish to add additional U.S. Published Application citation information please click the Add button. Add

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	2008-539500	JP	A	2008-11-13	Telefonaktiebolaget LM Ericsson	Japanese equivalent of WO 2006/115442 below.	☒
	2	2006/115442	WO	A1	2006-11-02	Telefonaktiebolaget LM Ericsson	English equivalent of JP 2008-539500 above.	☐
	3	2001-523074	JP	A	2001-11-20	Genesys Telecommunications Laboratories, Inc.	Japanese equivalent of US 5,960,442 above.	☒

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

Receipt date: 11/15/2012	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2436
	Examiner Name	Yalew, Fikremariam A.
	Attorney Docket Number	P31880/45631-209480

If you wish to add additional Foreign Patent Document citation information please click the Add button			Add
NON-PATENT LITERATURE DOCUMENTS			Remove
Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	Office Action received for Japanese Patent Application No. 2010-206462, mailed October 2, 2012, 3 pages of Japanese Office Action and 4 pages of unofficial English translation.	☒
If you wish to add additional non-patent literature document citation information please click the Add button			Add

EXAMINER SIGNATURE			
Examiner Signature	/Fikremariam Yalew/	Date Considered	12/11/2012

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

Receipt date: 11/15/2012	Application Number	12567386 12567386 - GAU: 2436
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2009-09-25
	First Named Inventor	Tobias M. Kohlenberg
	Art Unit	2436
	Examiner Name	Yalew, Fikremariam A.
	Attorney Docket Number	P31880/45631-209480

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/CHRISTOPHER A. SINGH/	Date (YYYY-MM-DD)	2012-11-15
Name/Print	CHRISTOPHER A. SINGH	Registration Number	61236

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /F.Y./

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12567386	KOHLENBERG ET AL.
	Examiner	Art Unit
	`FIKREMARIAM A YALEW	2436

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	12/13/2012								
	1	=								
	2	=								
	3	=								
	4	=								
	5	=								
	6	=								
	7	=								
	8	=								
	9	=								
	10	=								
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	18	=								
	19	=								
	20	=								
	21	=								
	22	=								
	23	=								
	24	=								
	25	=								

Petitioner Samsung Ex-1004, 0474

Issue Classification

Application/Control No.	Applicant(s)/Patent Under Reexamination
12567386	KOHLENBERG ET AL.
Examiner	**Art Unit**
FIKREMARIAM A YALEW	2436

ORIGINAL		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
726	1	G	0	6	F	17 / 00 (2006.01.01)						

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				
709	223				
455	411				
713	193				

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17												
	2		18												
	3		19												
	4		20												
	5		21												
	6		22												
	7		23												
	8		24												
	9		25												
	10														
	11														
	12														
	13														
	14														
	15														
	16														

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	25	
/FIKREMARIAM A YALEW/ Examiner.Art Unit 2436	07/30/2012	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Petitioner Samsung Ex-1004, 0475

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/567,386	01/22/2013	8359629	P31880 / 45631-209480	4223

73486 7590 12/29/2012

Barnes & Thornburg, LLP
c/o CPA Global
P.O. Box 52050
Minneapolis, MN 55402

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 403 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Tobias M. Kohlenberg, Portland, OR;
Selim Aissi, Beaverton, OR;
Dennis M. Morgan, Pine Grove, CA;
Alan D. Ross, Shingle Springs, CA;
Jim S. Baca, Corrales, NM;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

Petitioner Samsung Ex-1004, 0476

Electronic Acknowledgement Receipt

EFS ID:	14242452
Application Number:	12567386
International Application Number:	
Confirmation Number:	4223
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Customer Number:	73486
Filer:	Christopher A. Singh
Filer Authorized By:	
Attorney Docket Number:	P31880 / 45631-209480
Receipt Date:	15-NOV-2012
Filing Date:	25-SEP-2009
Time Stamp:	18:54:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1060
RAM confirmation Number	7310
Deposit Account	504238
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)

Electronic Patent Application Fee Transmittal

Application Number:	12567386
Filing Date:	25-Sep-2009
Title of Invention:	METHOD AND DEVICE FOR CONTROLLING USE OF CONTEXT INFORMATION OF A USER
First Named Inventor/Applicant Name:	Tobias M. Kohlenberg
Filer:	Christopher A. Singh
Attorney Docket Number:	P31880 / 45631-209480

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Petition fee- 37 CFR 1.17(h) (Group III)	1464	1	130	130
Request for continued examination	1801	1	930	930
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Adjustment date: 01/02/2013 SDIRETA1 12567386
11/16/2012 INTEFSW 00007310 584238
02 FC:1801 930.00 CR

AO 120 (Rev. 08/10)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas on the following ☐ Trademarks or ☐ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:22cv354	9/12/2022	Eastern District of Texas

PLAINTIFF	DEFENDANT
Daedalus Prime LLC	Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., Samsung Semiconductor, Inc., and Samsung Austin Semiconductor, LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,996,135	6/12/2018	Daedalus Prime LLC
2	10,705,960	7/7/2020	Daedalus Prime LLC
3	10,372,197	8/6/2019	Daedalus Prime LLC
4	9,887,838	2/6/2018	Daedalus Prime LLC
5	8,359,629	1/22/2013	Daedalus Prime LLC

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court Eastern District of Texas on the following

☐ Trademarks or ☐ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:22cv354	9/12/2022	Eastern District of Texas

PLAINTIFF	DEFENDANT
Daedalus Prime LLC	Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., Samsung Semiconductor, Inc., and Samsung Austin Semiconductor, LLC

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,432,840	8/30/2016	Daedalus Prime LLC
2			
3			
4			
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In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy