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EP 2254083 A1
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US 20080291021 A1

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(54) Title of the Invention: **Property management system**
Abstract Title: **Property management system**

(57) A property management system comprises a plurality of computer readable location identifiers, either being a barcode or RFID tag. Each location identifier is associated with a respective location of at least one property to be managed and a server is arranged to receive data indicating a location of the at least one property to be managed. The data indicating a location is generated by a computer, e.g. mobile phone or a tablet computer, based upon the computer readable location identifier, and the server generates a request for further data based upon the data indicating a location of the at least one property. The server transmits the request for further data to said computer, receives further data from said computer in response to said request for further data and generates output data associated with management of the location of the at least one property to be managed based upon said location identifier and said further data. Output data may comprise a message to a service provider, for example an email or SMS. The request for information may relate to a fault of furniture or equipment or may be related to the reservation of a room or property.

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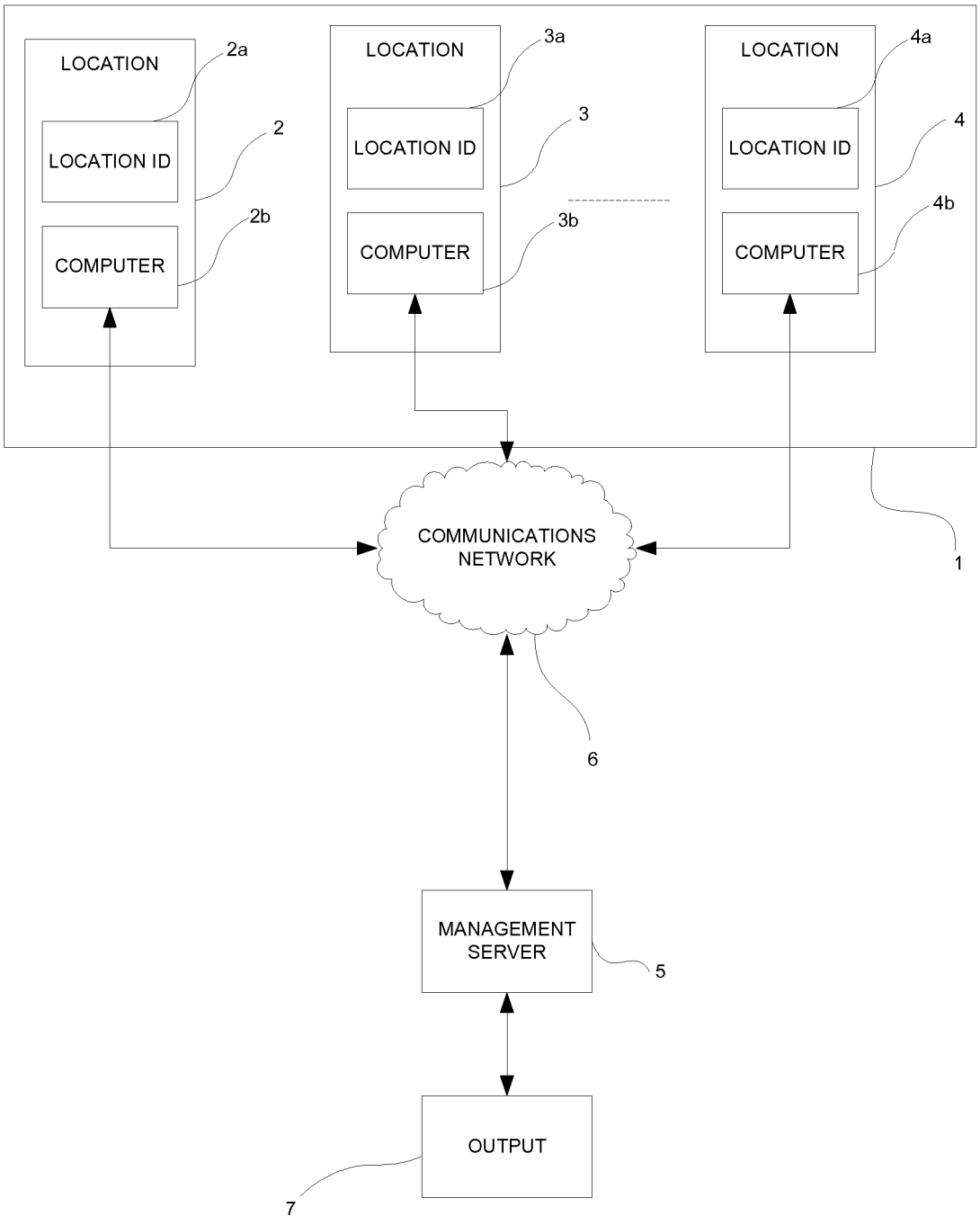
LOCATION
2a
LOCATION ID
2
COMPUTER
2b
LOCATION
3a
LOCATION ID
3
COMPUTER
3b
LOCATION
4a
LOCATION ID
4
COMPUTER
4b
COMMUNICATIONS NETWORK
1
6
MANAGEMENT SERVER
5
OUTPUT
7

FIG 1

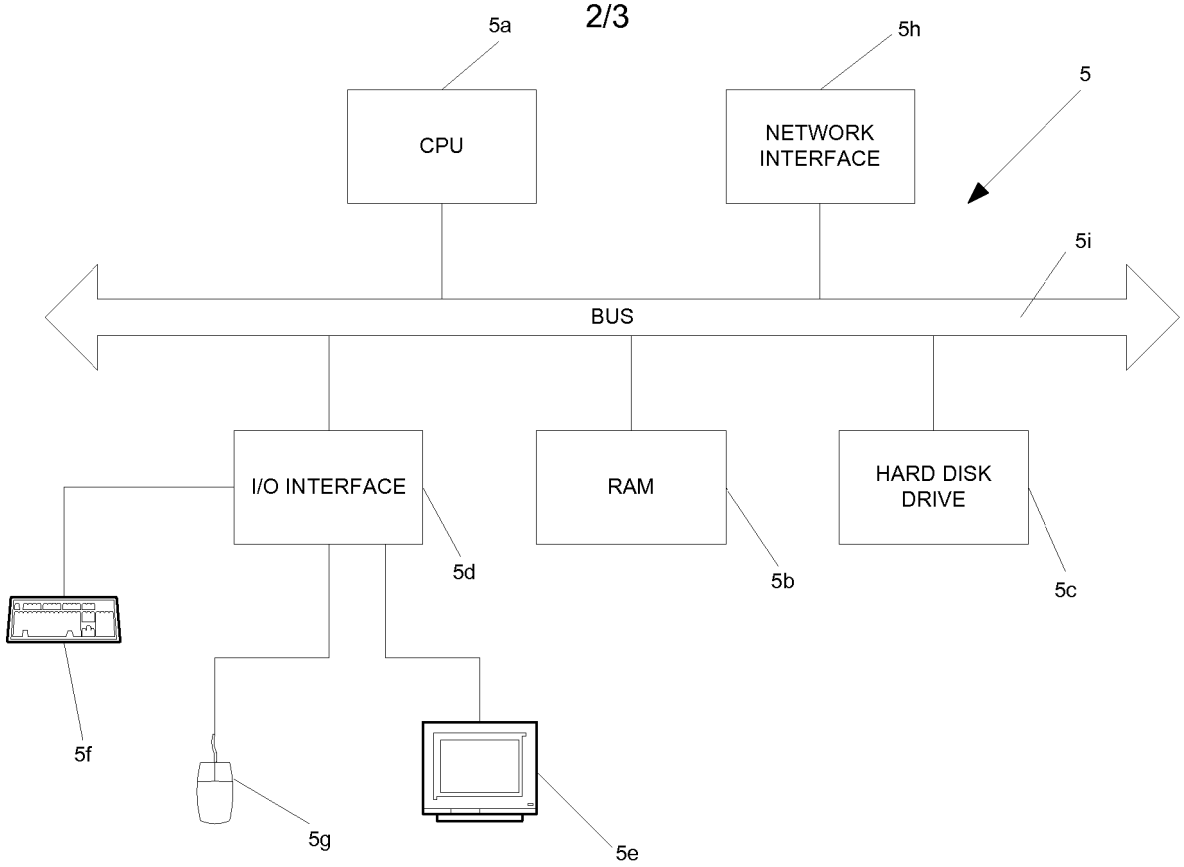
5a
5h
5
CPU
NETWORK INTERFACE
5i
BUS
I/O INTERFACE
RAM
HARD DISK DRIVE
5d
5b
5c
5f
5g
5e

Fig. 1A

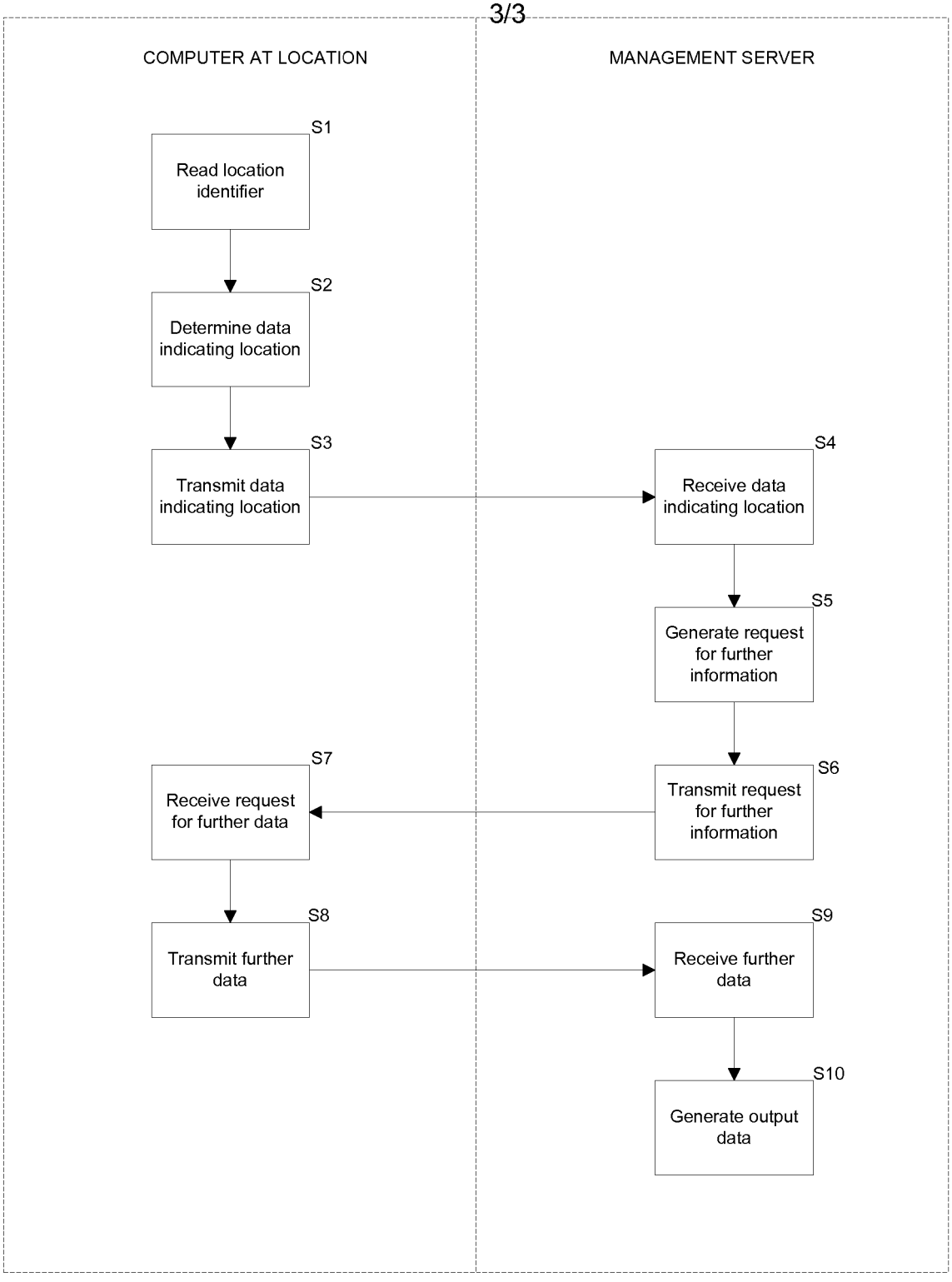
COMPUTER AT LOCATION
MANAGEMENT SERVER
S1
Read location identifier
S2
Determine data indicating location
S3
Transmit data indicating location
S4
Receive data indicating location
S5
Generate request for further information
S6
Transmit request for further information
S7
Receive request for further data
S8
Transmit further data
S9
Receive further data
S10
Generate output data

FIG 2

Property Management System

Technical Field

The present invention relates to methods and apparatus for managing property.

Background of the Invention

It is desirable that any faults within a managed property are quickly and effectively rectified. For example, often users of the property are paying for the use of the property and expect the building to be well maintained and fault free.

One way to ensure that faults with a property are quickly identified is for individuals to be employed to regularly check the property for faults. However employing an individual to check the property incurs costs and in any case does not ensure that faults are identified quickly as a property may be very large, and may for example consist of a number of associated buildings, such that a complete check of the property may take considerable time and a fault may not be identified quickly.

One way in which faults in a property can be identified quickly is by users of the property notifying the property manager of any faults they discover. However users often do not report faults they are aware of for reasons such as not knowing how to report an identified fault. Even when a user has the details of who to contact to report a fault the information provided by the user is often limited and does not provide the necessary information to effectively rectify the fault. There is therefore a need for improvements in ways of allowing users to report faults in a property.

It is an object of the invention to provide improvements in property management.

Summary of the Invention

According to the invention there is provided a property management system comprising: a plurality of computer readable location identifiers, each location identifier being associated with a respective location of at least one property to be managed; a server arranged to: receive data indicating a location of the at least one property to be managed, the data indicating a location being generated by a computer based upon the computer readable location identifier; generate a request for further data based upon the data indicating a location of the at least one property; transmit the request for further data to said computer; receive further data from said computer in response to

said request for further data; and generate output data associated with management of the location of the at least one property to be managed based upon said location identifier and said further data.

In this way, detailed and accurate information is collected from a user with no knowledge of the property required. Because the server can identify the location of the property the server is able to request specific information associated with the location from the user and the server is therefore provided with improved information that enables the property to be quickly and effectively managed. Additionally or alternatively the invention provides an interface for users of the property by which different information can be provided to and collected from the user based upon the user's location.

At least one of the plurality of computer readable location identifiers may comprise an optical machine-readable representation and the data indicating a location may be generated based upon an image of the computer readable location identifier captured by the computer.

At least one of the plurality of computer readable location identifiers may comprise a radio-frequency identification (RFID) tag.

The computer may be a mobile computing device such as a telephone or a tablet computer associated with a user of the property arranged to obtain the data indicating a location from at least one of the plurality of computer readable location identifiers using hardware of the mobile computing device, for example a camera of the mobile computing device or an RFID tag reader.

At least one of the plurality of computer readable location identifiers may comprise data associated with a respective computer associated with the location and the data indicating a location may be generated by the respective computer. For example, each of the plurality of locations may have a respective computer located at the location and the computer may include hardware that can be used to uniquely identify the computer and therefore the location.

The server may for example store data associating locations with identifiers such that upon receipt of the data identifying a location the server may perform a look-up based upon the data identifying the location to identify the particular location.

The request for further information may cause a user interface suitable for inputting data associated with the indicated location to be generated on the computer. For example, the computer may be provided with an application associated with property management that processes the request for further information and provides a user interface that is suitable for receiving the requested further information.

The output data may comprise an electronic message to a service provider of the property. For example the electronic message may be an email or a short message service (SMS) message or any other suitable electronic message. The server may be further arranged to transmit the electronic message to the service provider of the property.

The request for further data may comprise a request for information associated with a problem at the indicated location. For example the location may include a plurality of items of furniture/equipment and the request for information may provide a user interface that allows a user to select an item of furniture/equipment that has a fault that needs attention. Alternatively or additionally the request for information may request that an image of the item of furniture/equipment or a portion of the item of furniture/equipment is provided. For example the user interface may be an image capture interface.

The request for further data may comprise a request for information associated with reservation of a room of the property. That is, the provision of the location identifier may be associated with reservation of the room. For example, the provision of the location identifier may indicate a desire to reserve the room or may indicate to the server that an individual has arrived at a reserved room. The request for information may request confirmation information or may request details of the reservation such as a duration of the reservation. In this way, the request for information may for example provide a method of confirming the identity of a user of a location or may facilitate management of usage of the location.

The output data may comprise data arranged to cause update of a database indicating availability of rooms of the property.

Generating the request for further data based upon the data indicating a location of the at least one property may comprise selecting data from a database based upon said indicated location, wherein said request for further data is based upon said selected data. That is, the request for further data may be based upon a database look-up to determine data specific to the location.

According to a further aspect of the invention there is provided a computer apparatus for use in a property management system comprising a memory storing processor readable instructions; and a processor arranged to read and execute instructions stored in the memory; wherein the processor readable instructions comprise instructions arranged to control the computer to: obtain data indicating a location from a computer readable location identifier of a plurality of computer readable location identifiers, each location identifier being associated with a respective location of at least one property to be managed; transmit the data indicating a location of the at least one property to be managed to a server; receive a request for further data, the request for further data being generated by a server based upon the data indicating a location of the at least one property; and transmit further data in response to said request for further data; wherein said location identifier and said further data provide data for generation of output data associated with management of the location of the at least one property to be managed.

The invention therefore also provides a computer apparatus arranged to allow a user to use the property management system.

The invention also provides a method of managing a property comprising: providing a plurality of computer readable location identifiers, each location identifier being associated with a respective location of at least one property to be managed; obtaining, at a computer, data indicating a location from one of said computer readable location identifiers; transmitting, by said computer to a server, said data indicating a location of the at least one property to be managed; generating, by said server, a request for further data based upon the data indicating a location of the at least one property; transmitting, from said server to said computer, the request for further data;

receiving, at said computer from said server, a request for further data; transmitting, from said computer to said server, further data in response to the request for further data; receiving, at said server from said computer, the further data; and generating, at said server, output data associated with management of the location of the at least one property to be managed based upon the location identifier and the further data.

Aspects of the invention can be combined and it will be readily appreciated that features described in the context of one aspect of the invention can be combined with or used in other aspects of the invention.

It will be appreciated that aspects of the invention can be implemented in any convenient form. For example, the invention may be implemented by appropriate computer programs which may be carried on appropriate carrier media which may be tangible carrier media (e.g. disks) or intangible carrier media (e.g. communications signals). Aspects of the invention may also be implemented using suitable apparatus which may take the form of programmable computers running computer programs arranged to implement the invention.

Brief Description of the Drawings

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

Figure 1 is a schematic illustration of a property management system according to the invention;

Figure 1A is a schematic illustration of a computer suitable for carrying out the invention; and

Figure 2 is a flow chart schematically showing transfer of data between computers in the network of Figure 1.

Detailed description

Referring first to Figure 1, a property management system for management of at least one property 1 comprising a plurality of locations 2, 3, 4 is shown. The at least one

property may be for example one or more buildings containing a plurality of serviced offices and the locations may be areas of the one or more buildings including the serviced offices and communal areas at which a problem may be identified by a user. Alternatively the locations may be associated with particular items within an area such as items of machinery and/or furniture.

Each of locations 2, 3, 4 has a respective associated location identifier 2a, 3a, 4a that can be read by a computer 2b, 3b, 4b and processed by the computer 2b, 3b, 4b to generate data identifying the location associated with the location identifier. The location identifier 2a, 3a, 4a may be processed for example by an application running on the computer 2b, 3b, 4b. For example, each location identifier 2a, 3a, 4a may take the form of a bar code and computer 2b, 3b, 4b may be a portable computer such as a mobile telephone of a user of the location such that the bar code can be captured by a camera of the mobile telephone and processed to generate data identifying the associated location. It will be appreciated that more than one location may be used by a single user such that computers 2b, 3b, 4b may be a single portable computer such as a mobile telephone or tablet computer.

Alternatively each of location identifier 2a, 3a, 4a may have a corresponding computer 2b, 3b, 4b located at the respective location that may be used at the location to carry out the invention. Each location identifier may for example be data associated with the corresponding computer such as data associated with a network device of the computer such an IP address or a MAC address or the like. Alternatively the location identifier may be data embedded in software running on the computer that can be interpreted to uniquely identify the location associated with the computer.

A management server 5 is arranged to communicate with computers 2b, 3b, 4b over a communications network 6. The data identifying the location that is generated based upon the location identifiers 2a, 3a, 4a can therefore be provided from the associated location by computers 2b, 3b, 4b to the management server 5 such that the management server 5 can automatically identify the location of a user of the property management system, for example where the user identifies a problem with the location.

The management server 5 is arranged to generate a request for additional information based upon the data identifying the location and using the communications network 6

to transmit the request for additional information to the computer 2b, 3b, 4b associated with the user. The computer 2b, 3b, 4b is arranged to process the request for additional information, for example using an application running on the computer that processed the location identifier, and to provide a user interface to the user that allows the user to input additional information as indicated in the request for additional information. The request for additional information may for example request an indication of the nature of a problem with the location.

The computer 2b, 3b, 4b communicates the requested additional information to the management server 5 using the communication network 6 and the management server 5 is arranged to process the data identifying the location and the additional information to generate an output 7. The output 7 may take any convenient form such as an indication to a buildings manager to arrange for the problem to be fixed or automatic generation of a message that is communicated to a service provider selected based upon the requested additional information.

The invention therefore provides a property management system in which users of the property are able to notify a central management server of a problem with the property in a way that allows the problem to be identified in a straightforward way, without requiring any particular knowledge relating to the property on the part of the user.

Figure 1A shows the management server 5 in further detail, although it will be appreciated that each of computers 2b, 3b, 4b will typically have the same general structure. It can be seen that the server comprises a CPU 5a which is configured to read and execute instructions stored in a volatile memory 5b which takes the form of a random access memory. The volatile memory 5b stores instructions for execution by the CPU 5a and data used by those instructions. For example, in use, data such as data received from one of computers 2b, 3b, 4b may be stored in volatile memory 5b.

The server 5 further comprises non-volatile storage in the form of a hard disc drive 5c. Data such as data received from computers 2b, 3b, 4b may be stored on hard disc drive 5c and may for example be analysed to generate data indicating common problems that arise in the property. The server 5 further comprises an I/O interface 5d to which are connected peripheral devices used in connection with the server 5. More particularly, a display 5e is configured so as to display output from the computer 5 such

as output 7. Input devices are also connected to the I/O interface 5d. Such input devices may include a keyboard 5f and a mouse 5g which allow user interaction with the server 5. It will be appreciated that the computer may have other input interfaces, for example portable computers 2b, 3b, 4b may have any known portable computer interface such as a touch screen. A network interface 5h allows the server 5 to be connected to an appropriate communications network such as communications network 6 so as to receive and transmit data from and to other computers such as computers 2b, 3b, 4b. The CPU 5a, volatile memory 5b, hard disc drive 5c, I/O interface 5d, and network interface 5h, are connected together by a bus 5i.

Figure 2 shows processing carried out at a computer located at one of locations 2, 3, 4 and at management server 5, as shown in Figure 1, to generate output data associated with a problem at the location. At step S1 a location identifier at the location is read by the computer, for example by scanning a bar code at the location

Each location identifier 2a, 3a, 4a of Figure 1 is arranged to provide data indicating its associated location to a computer 2b, 3b, 4b and may take any convenient form. For example, each computer 2b, 3b, 4b may be a portable computer such as a mobile telephone or other portable computing device such as a tablet computer associated with a user of the property management system and the location identifiers 2a, 3a, 4a may be machine readable codes such as a bar code or RFID tag that can be read by the mobile telephone. At step S2 data indicating the location is determined based upon the machine readable code and at step S3 the data indicating the location is transmitted to the management server. For example, where the machine readable code is a bar code, an application running on the computer may process the bar code to determine data indicating the location that the management server can use to identify the particular location of the plurality of locations 2, 3, 4 of the property.

At step S4 the data indicating the location is received by the management server 5 and at step S5 the management server processes the data indicating the location to generate a request for further information. For example the management server 5 may perform a database look-up based upon the data indicating the location to determine the associated location and determine further information that is required for the indicated location.

For example, the request for further information may include a request for an indication of the nature of the fault identified by the user. The request for further information is generally based upon the identified location and where the location is an area of the property may take the form of a request for an indication of equipment known to be located at the location that may have a fault. Alternatively, where the location identifies a particular item within an area such as items of machinery and/or furniture, the request for further information may include a request for details of the nature of the fault with a particular item within an area such as items of machinery and/or furniture. It will be appreciated that where the location is an area of the property and a request for identification includes a request for an indication of particular equipment at the location that has a fault, the request for further information may additionally include a request for details of the nature of the fault.

At step S6 the request for further information is transmitted to the computer at the location and at step S7 the request for further information is received by the computer at the location and the user is provided with a user interface to allow the user to input the requested further information. For example, the request for further information may be processed by an application of the computer and a user interface may be generated based upon the particular information that is requested. The user interface may take any convenient form and may include drop down lists and user selectable options. At step S8 further information input to the computer by the user is transmitted to the management server and at step S9 the further data input by the user is received by the management server.

At step S10 the management server processes the data identifying the location and the received further information to generate output data. The output data may take any convenient form, however because the data identifying the location and the received further information is generated based upon reading a location identifier located at the particular location the output data is based upon reliable information. Accordingly the output data may be used to automatically generate a message instructing a service provider to attend to a fault identified by the data provided by the user and the request for further information may allow a relevant service provider to be instructed. For example, the output may take the form of an email or other electronic communication that is sent directly to the service provider for the service provider to respond.

Whilst it is described above that the invention is used for providing an indication and details of a fault with a property, it will be appreciated that the invention has applications in other areas of property management. For example, the location identifier could be used to provide an indication of a facility of a property that may be reserved, for example a conference room. In such an embodiment the request for additional information may be a request for information associated with the reservation of the room such as an amount of time for which the room is to be reserved or a request for confirmation of the individuals that are using the room. The output data may take any convenient form, for example updating of a database indicating that the room is reserved or arranging for refreshments to be provided to the room for the confirmed individuals.

Additionally the invention has applications in other property management scenarios, for example in management of a hotel or a spa. For example in hotel management a location identifier may be provided in rooms of the hotel and the request for further data may for example provide a room service menu from which selections can be made where the location identifier indicates a hotel room or a spa treatment reservation menu where the location identifier indicates a spa associated with the hotel. It will be appreciated that various other requests for further data and corresponding provided further data than those described herein as would be contemplated by the skilled person fall within the scope of the invention.

Although specific embodiments of the invention have been described above, it will be appreciated that various modifications can be made to the described embodiments without departing from the spirit and scope of the present invention. That is, the described embodiments are to be considered in all respects exemplary and non-limiting. In particular, where a particular form has been described for particular processing, it will be appreciated that such processing may be carried out in any suitable form arranged to provide suitable output data.

CLAIMS:

1. A property management system comprising:

a plurality of computer readable location identifiers, each location identifier being associated with a respective location of at least one property to be managed;

a server arranged to:

receive data indicating a location of the at least one property to be managed, the data indicating a location being generated by a computer based upon the computer readable location identifier;

generate a request for further data based upon the data indicating a location of the at least one property;

transmit the request for further data to said computer;

receive further data from said computer in response to said request for further data; and

generate output data associated with management of the location of the at least one property to be managed based upon said location identifier and said further data.

2. A property management system according to claim 1, wherein at least one of the plurality of computer readable location identifiers comprises an optical machine-readable representation and wherein the data indicating a location is generated based upon an image of the computer readable location identifier captured by said computer.

3. A property management system according to claim 1, wherein at least one of the plurality of computer readable location identifiers comprises a radio-frequency identification tag.

4. A property management system according to claim 1, 2 or 3, wherein said computer is a mobile telephone or a tablet computer associated with a user of the property.

5. A property management system according to claim 1, 2 or 3, wherein at least one of the plurality of computer readable location identifiers comprises data associated with a respective computer associated with the location and wherein said data indicating a location is generated by said respective computer.

6. A property management system according to any preceding claim, wherein the request for further information causes a user interface suitable for inputting data associated with the indicated location to be generated on said computer.

7. A property management system according to any preceding claim, wherein said output data comprises an electronic message to a service provider of the property.

8. A property management system according to any preceding claim, wherein the request for further data comprises a request for information associated with a problem at the indicated location.

9. A property management system according to claim 8, wherein the server is further arranged to transmit said electronic message to said service provider of the property.

10. A property management system according to any one of claims 1 to 7, wherein the request for further data comprises a request for information associated with the reservation of a room of the property.

11. A property management system according to claim 10, wherein the output data comprises data arranged to cause update of a database indicating availability of rooms of the property.

12. A property management system according to any preceding claim, wherein generating the request for further data based upon the data indicating a location of the at least one property comprises:

selecting data from a database based upon said indicated location, wherein said request for further data is based upon said selected data.

13. A computer apparatus for use in a property management system comprising:

a memory storing processor readable instructions; and

a processor arranged to read and execute instructions stored in the memory;

wherein the processor readable instructions comprise instructions arranged to control the computer to:

obtain data indicating a location from a computer readable location identifier of a plurality of computer readable location identifiers, each location identifier being associated with a respective location of at least one property to be managed;

transmit said data indicating a location of the at least one property to be managed to a server;

receive a request for further data, the request for further data being generated by a server based upon the data indicating a location of the at least one property; and

transmit further data in response to said request for further data;

wherein said location identifier and said further data provide data for generation of output data associated with management of the location of the at least one property to be managed.

14. A computer apparatus according to claim 13, wherein at least one of the plurality of computer readable location identifiers comprises an optical machine-readable representation and wherein the data indicating a location is generated based upon an image of the computer readable location identifier captured by said computer.

15. A computer apparatus according to claim 13, wherein at least one of the plurality of computer readable location identifiers comprises a radio-frequency identification tag.

16. A computer apparatus according to claim 13, 14 or 15, wherein said computer apparatus is a mobile telephone or a tablet computer associated with a user of the property.

17. A computer apparatus according to claim 13, 14 or 15, wherein the computer readable location identifier of the plurality of computer readable location identifiers comprises data associated with the computer apparatus associated and wherein said data indicating a location is generated by said computer apparatus.

18. A computer apparatus according to any preceding claim, wherein the received request for further information causes a user interface suitable for inputting data associated with the indicated location to be generated on the computer apparatus.

19. A computer apparatus according to any preceding claim, wherein said output data comprises an electronic message to a service provider of the property.

20. A computer apparatus according to any preceding claim, wherein the request for further data comprises a request for information associated with a problem at the indicated location.

21. A property management system according to any one of claims 13 to 20, wherein the request for further data comprises a request for information associated with the reservation of a room of the property.

22. A property management system according to claim 21, wherein the output data comprises data arranged to cause update of a database indicating availability of rooms of the property.

23. A method of managing a property comprising:

providing a plurality of computer readable location identifiers, each location identifier being associated with a respective location of at least one property to be managed;

obtaining, at a computer, data indicating a location from one of said computer readable location identifiers;

transmitting, by said computer to a server, said data indicating a location of the at least one property to be managed;

generating, by said server, a request for further data based upon the data indicating a location of the at least one property;

transmitting, from said server to said computer, the request for further data;

receiving, at said computer from said server, a request for further data;

transmitting, from said computer to said server, further data in response to the request for further data;

receiving, at said server from said computer, the further data; and

generating, at said server, output data associated with management of the location of the at least one property to be managed based upon the location identifier and the further data.

24. A computer program comprising computer readable instructions configured to cause a computer to carry out a method according to claims 23.

25. A computer readable medium carrying a computer program according to claim 24.

Application No: GB1218512.0 **Examiner:** Mr Stuart Purdy

Claims searched: 1-25 **Date of search:** 15 February 2013

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-9, 13-20, 23-25	EP 2254083 A1 (AHOLD LICENSING) See whole document and note in particular paragraphs 33-41, 48-50;
X	1-9, 13-18, 23-25	DE 102009008820 A1 (QVS) See WPI abstract [AN 2010-L55984 [60]] and figures and note in particular paragraphs 5 and 6;
X	1, 2, 4-7, 10, 12-14, 16-19, 21, 23-25	US 2011/137706 A1 (HOWARD) See whole document and note in particular paragraphs 8, 9, and 14;
X	1, 2, 4-7, 10, 12-14, 16-19, 21, 23-25	AU 2009101131 A4 (VERIFIED INTERNATIONAL) See whole document and note in particular page 9 and the embodiment associated with figure 5;
X	1, 2, 4-7, 10, 12-14, 16-19, 21, 23-25	GB 2488993 A (JENTON) See whole document;
X	1, 3, 4, 6, 10-13, 15, 16, 18, 21-25	US 2008/291021 A1 (BHOGAL) See whole document and note in particular paragraphs 17-22;
X	1, 3, 4, 6, 10-13, 15, 16, 18, 21-25	EP 2439686 A1 (WALKER) See whole document and note in partiuiclar paragraphs 12, 22, 23, 25, and 26;

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[X] :

Worldwide search of patent documents classified in the following areas of the IPC

G06Q

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, TXTUS0, TXTUS1, TXTUS2, TXTUS3, TXTUS4, TXTEP1, TXTGB1, & TXTWO1

International Classification:

Subclass	Subgroup	Valid From
G06Q	0050/16	01/01/2012
G06Q	0010/00	01/01/2012