

METHOD, DEVICE AND SYSTEM FOR DELIVERING CONTENT TO AN AD HOC NETWORK MOBILE TERMINAL

5 The present invention refers to a method of delivering content to an ad hoc network mobile terminal, as well as to a respective system and device.

10 With the advent of the Internet, delivering content to a user has become a common practice. The introduction of wireless communication, and subsequently the rapidly growing use of data applications with mobile wireless communication devices, or mobile terminals, has created various opportunities to provide new services and existing services to mobile communication devices. Consequently, there are also a number of developments in methods used for delivering content for use in wireless communication.

15 In an example related to Bluetooth enabled devices, patent application US 2005/0054438 discloses a method and apparatus for associating a patron with a wagering game play at a gaming machine in a server-based gaming network. Here, patrons are equipped with Bluetooth enabled devices capable of detecting and transmitting the patron identification to a central server, which then grants
20 them access to participate in games and access to their gaming account information. To ensure that no unauthorized person is able to access or use a patron's gaming account, the Bluetooth enabled devices are equipped with secured card reader devices for delivering content.

25 Recently, Bluetooth hotspot areas have been used to deliver content in a location based service as follows. The location based service is usually used in places where there is high human traffic, such as tourist attractions, shopping malls and cinemas. In this location based service, the method of delivering content simply involves detecting a mobile terminal and then pushing a selected content to it.

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This method of delivering content has been used, for example, by information providers, such as the marketing and advertising industry, to push out content about the products or services of their clients. These information providers also use the blanket approach, namely, to push content on their products or the services to all mobile terminals which are able to receive the content.

This blanket approach is not significantly different from similar approaches used with fax machines or even with e-mail systems, where junk faxes and spam e-mails respectively has become a huge problem and has led to a lot of frustration among users. Accordingly, if this method of delivering content continues to be used in such a manner, users of mobile terminals will only get increasingly frustrated, with having to continuously reject unwanted content pushed onto their mobile terminals. The blanket approach suffers from the following disadvantages.

Firstly, on the users' side, the receiving of unwanted content causes inconvenience and at times even frustration. Consequently, the user may reject a content from an unknown source.

Secondly, the information providers do not have any information on whether a mobile terminal user is a potential customer or not. The information providers do not have any means to gather such information quickly or sufficiently in order to run a meaningful marketing or advertising campaign. Therefore, given this situation, the information providers can only resort to simply pushing content out to every mobile terminal, i.e., the blanket approach.

The fact that a significantly large proportion of content sent may be rejected shows that there is a lot of wastage associated with using this blanket approach. It is therefore desirable for the information providers to adopt a more efficient and convenient approach of delivering content to mobile terminals, without appearing intrusive but yet provide a personalized content.

This problem is solved by the method, system and device as defined in the respective independent claims of the present application.

According to a first aspect of the invention, a method of delivering content to an
5 ad hoc network mobile terminal is provided. The method comprises determining
from a message including a user-settable mobile terminal identifier the user-
settable mobile terminal identifier, determining content data being associated
with the user-settable mobile terminal identifier from a database that includes
content data for at least the user-settable mobile terminal identifier, and sending
10 the determined content data to the ad hoc network mobile terminal using an ad
hoc communication connection.

The embodiments which are described in the context of the method of delivering
content to an ad hoc network mobile terminal are analogously valid for the
15 system and the device.

The method provided in the present invention gives a mobile terminal user the
choice to 'select' content data he wishes to receive, instead of only the choice to
accept or reject a content data sent to the mobile terminal previously. In one
20 embodiment, the 'selecting' of content data can be performed, when the user
changes the user-settable mobile terminal identifier of his mobile terminal to
indicate content data he wishes to receive.

For example, if the mobile terminal user would like to receive news related
25 information, the mobile terminal user can change the user-settable identifier of
his mobile terminal to 'NEWS'. When this mobile terminal user enters an ad hoc
network hotspot area, the user-settable mobile terminal identifier is determined
from a message exchanged between his mobile terminal and the network. Then,
the content data being associated with the user-settable mobile terminal identifier
30 is determined from a database. Finally, the determined content data, which in this
case is the news related content data, is sent to the user's mobile terminal. The

user can then select Accept in the prompt corresponding to the content received on his mobile terminal, in order to receive the news related information content data. As used herein, a hotspot area refers to an area within the coverage of the ad hoc network.

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In addition, with the method provided in the invention, for the information providers, it is possible now to obtain information on whether a mobile terminal user is interested in the products or services. Therefore, the information providers now have one clearly advantageous approach to reach their customers, other than the blanket approach described earlier.

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A 'mobile terminal' used in the present invention can be any portable communication device. For example, a mobile terminal may be a mobile phone, a personal digital assistant (PDA) or a multi-function personal communication device such as a Blackberry device, or even a suitably equipped portable small laptop computer.

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A mobile terminal operates within the coverage of an ad hoc network, or as stated above, in a hotspot area. The ad hoc network, for example, may be, but is not limited to a Bluetooth network, a HIPERLAN network, a HIPERLAN2 network, or an IEEE 802 wireless network. Examples of an IEEE 802 wireless network include, but are not limited to, the IEEE 802.11a wireless local area network (WLAN), the IEEE 802.11b WLAN, the IEEE 802.11g WLAN, and the IEEE 802.15 wireless personal area network (WPAN).

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The method provided, as mentioned earlier, includes determining from a message including a user-settable mobile terminal identifier the user-settable mobile terminal identifier.

A 'message' refers to a data item being sent to a communication endpoint, where the data item is arranged according to a pre-determined format, and is used for pre-determined communication functions in an ad hoc network.

- 5 For example, in order to set up an ad hoc connection between two mobile terminals, the first mobile terminal may send a connection setup request message to the second mobile terminal, and the second mobile terminal may reply with a connection setup accept message or with a connection setup reject message.

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Accordingly, in one embodiment, the message from which the user-settable mobile terminal identifier is determined is a communication connection setup message. For example, in a Bluetooth network, the message from which the user-settable mobile terminal identifier is determined is the Name Response message. In another example, for an IEEE 802.11 WLAN network, the messages from which the user-settable mobile terminal identifier can be determined include the Domain Name Service (DNS) messages and the Dynamic Host Configuration Protocol (DHCP) messages.

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- 20 In one embodiment, the method provided further comprises generating the message including a user-settable mobile terminal identifier.

In one embodiment, generating the message comprises inputting the user-settable mobile terminal identifier by the user. The user may directly manually input the user-settable mobile terminal identifier, for example. Alternatively, the user may run a program, also known as a script, implemented on his mobile terminal to generate a series of characters so that the program then inputs the series of characters into the user-settable mobile terminal identifier.

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- 30 In one embodiment, generating the message further comprises arranging the user-settable mobile terminal identifier into the message body or the message

header of the message. For example, in a Bluetooth network, the user-settable mobile terminal identifier is typically arranged into the message body of the Name Response message. In another example, for an IEEE 802.11 WLAN network, the user-settable mobile terminal identifier is typically arranged into the message body of the DNS messages and the DHCP messages.

In one embodiment, generating the message further comprises arranging the user-settable mobile terminal identifier into the ad hoc network mobile terminal identifier field of the message header.

The 'user-settable mobile terminal identifier' can be any mobile terminal identifier which the user is allowed to change arbitrarily.

For example, in a Bluetooth ad hoc network, the user-settable mobile terminal identifier is the Bluetooth user friendly name, which is also known as the Bluetooth device name. In this embodiment, this identifier is used to indicate content data which the user of a Bluetooth enabled mobile terminal wish to receive. In another example, for an IEEE 802.11 WLAN network, the user-settable mobile terminal identifier is the Host Name.

In addition, since this identifier can be arbitrarily set by the user, this identifier need not be unique for mobile terminals. It is therefore further possible for two mobile terminals within the same ad hoc network to have the same user-settable mobile terminal identifier.

It is well-known that during the initial process of detecting and discovering mobile terminals in an ad hoc network, a series of messages are exchanged between the mobile terminals. Among these messages, there is at least one message which includes the user-settable mobile terminal identifier described earlier. Therefore, determining from a message including a user-settable mobile terminal identifier the user-settable mobile terminal identifier comprises identifying the

message which includes the user-settable mobile terminal identifier, and determining the user-settable mobile terminal identifier from the message identified.

- 5 Once the user-settable mobile terminal identifier is determined, the next step is determining content data that is associated with the user-settable mobile terminal identifier (which had been determined earlier), from a database that includes content data for at least the user-settable mobile terminal identifier. A 'database', as used herein, refers to a collection of data stored in a computer in a systematic
10 manner, and in this case, the data stored is simply content data. Any kind of database can be used for the present invention.

The determining of content data associated with the user-settable mobile terminal identifier comprises matching a predefined keyword associated with the
15 content data to the user-settable mobile terminal identifier, up to a predetermined matching degree.

The term 'predefined keyword' refers to a series of characters arranged in a predetermined manner in order to represent a specific meaning or action. The
20 'predefined keyword' may be simply a word used to be used directly in a database search in order to obtain content data. However, the 'predefined keyword' may also be a phrase, which comprises an instruction to perform a series of steps, in order to obtain content data. In addition, the 'predefined keyword' may also be an arrangement of characters to represent, for example, a
25 set of user options, or a set of options for an instruction, which may be used to obtain content data. The 'predefined keyword' may also be a combination of two or more of the above.

An example of the predefined keyword being a word used directly in a database
30 search is the example of a mobile terminal user who wishes to receive news

related information, who changes the user-settable mobile terminal identifier to 'NEWS' accordingly, as described earlier.

5 In another example, the predefined keyword is a phrase comprising an instruction to perform a series of steps in order to obtain content data. For example, if a user sets the user-settable mobile terminal identifier of his mobile terminal to 'PHOTOGRAPH', the predefined keyword 'PHOTOGRAPH' may be an instruction to perform the following steps:

- activate a digital camera in the hotspot area where the user is in,
- 10 - locate the user and point the digital camera at him,
- take a panoramic photograph of him,
- store the digital photograph of him in the database (as "photo-id1-location1.jpg", for example), and
- send the digital photograph file "photo-id1-location1.jpg" to his mobile
- 15 terminal.

Accordingly, when the change in the user-settable mobile terminal identifier of this user's mobile terminal is detected, in subsequent processing, the instruction corresponding to the predefined keyword 'PHOTOGRAPH' will be executed.

20 Finally, this user will receive the digital photograph file "photo-id1-location1.jpg" on his mobile terminal.

In a further example, the predefined keyword is a combination of a phrase and an arrangement of characters to represent two set of options for an instruction, in order to obtain content data. In one embodiment, a user sets the user-settable mobile terminal identifier of his mobile terminal to 'PHOTOGRAPH /x2 /woF'. The 'PHOTOGRAPH' part of the predefined keyword may operate as described by the earlier example. In addition, the '/x2' part of the predefined keyword may be a set of user option indicating that the user would like to have 2 photographs of him

30 taken consecutively. Lastly, the '/woF' part of the predefined keyword may be

another set of user option indicating that the user would like to have the photograph of him taken without using a flash.

5 The term 'predetermined matching degree' refers to the amount of permissible variation allowed between the user-settable mobile terminal identifier and a predefined keyword, in determining whether there is a match or not. Thus, the predetermined matching degree is a settable parameter.

10 For example, the predetermined matching degree is set to tolerate up to 25% error (which means that an error in one character out of a word of four characters can be tolerated). If the user-settable mobile identifier is set to be 'CINMA', and this value in the user-settable mobile terminal identifier will be considered as a match to the predefined keyword 'CINEMA'. Likewise, it will be also considered as a match if the user-settable mobile identifier is set to be 'CINEM' or 'CNEMA'.
15 In addition, the process of determining of whether there is match or not, can be additionally configured, for example, to differentiate between lower case and upper case characters, or to ignore white spaces between characters. The predetermined matching degree can also be set to tolerate no error at all, but to require a perfect match, or a tolerance of 0% error. In that case, mismatches
20 such as 'CINMA', 'CINEM' or 'CNEMA', would not be accepted at all if the predefined keyword 'CINEMA' was used.

Matching a predefined keyword associated with the content data to the user-settable mobile terminal identifier up to a predetermined matching degree,
25 comprises two steps. The first step is matching the user-settable mobile terminal identifier to a predefined keyword from a list of predefined keywords, up to a predetermined matching degree. The second step is determining content data associated with the predefined keyword determined to be matched to the user-settable mobile terminal identifier, up to a predetermined matching degree.

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Once the content data associated with the user-settable mobile terminal identifier is determined, the next step is sending the determined content data to the ad hoc network mobile terminal using an ad hoc communication connection.

- 5 The ad hoc communication connection may be provided by a transmitter, corresponding to the ad hoc network used. For example, in a Bluetooth network, the transmitter is a Bluetooth transmitter.

10 In one embodiment, the method provided further comprises generating a database search request requesting content data being stored in the database and being associated with the user-settable mobile terminal identifier. In this embodiment, it is possible that no content associated with the user-settable mobile terminal identifier is found in the database.

- 15 Accordingly, in one embodiment, the method provided further comprises generating a request requesting for additional available content data, when no content associated with the user-settable mobile terminal identifier is available. For example, the additional available content data may be instructions on how to use the invention, or a list of predefined keywords used in the invention.

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In one embodiment, the method provided further comprises preventing the resending of content data that had been previously sent to the ad hoc network mobile terminal. Preventing the resending of content data that had been previously sent to the ad hoc network mobile terminal, can be carried out by
25 generating and maintaining a record of content data sent to all mobile terminals previously detected, and then determining whether the content data selected to be sent to the mobile terminal has been previously sent to the same mobile terminal. The determining of whether the content data selected to be sent to the mobile terminal has been previously sent to the same mobile terminal, may be
30 carried out using the mobile terminal unique identifier and the historical record of all content data sent to all mobile terminals previously detected.

Preventing the resending of content data that had been previously sent to the ad hoc network mobile terminal provides the following advantages.

5 Firstly, it prevents the sending of a content which will likely to be rejected at the mobile terminal. As each sending of a content involves some costs to the information providers such as the marketing and advertising industries (who may be charged a "per content" fee), by preventing the sending of a content which will likely to be rejected, this may represent potentially significant cost savings to
10 them.

Secondly, it involves collecting and maintaining information which represents the products and services which is of interest to specific mobile terminal users. Whenever the users change the user-settable mobile terminal identifier of their
15 mobile terminals to obtain content desirable to them, indirectly they are also filling up a pseudo-market survey. Therefore, it can also provide information useful to the information providers, such as the marketing and advertising industries.

Thirdly, preventing the resending of content data also prevents the transmission
20 channel from being monopolized by the repeated sending of a content which may be rejected by a mobile terminal. The transmission channel can thus be used for other purposes such as detecting mobile terminals which are new to the hotspot, or for providing content to other mobile terminal users who are interested to receive them.

25 In one embodiment, the method of delivering content to an ad hoc network mobile terminal provided, further comprises determining from a message including a mobile terminal unique identifier the mobile terminal unique identifier. For example, in a Bluetooth network, the messages from which the mobile
30 terminal unique identifier is determined include the Inquiry Response message and the Name Response message. In another example, for an IEEE 802.11

WLAN network, the messages from which the mobile terminal unique identifier can be determined include the Domain Name Service (DNS) messages and the Dynamic Host Configuration Protocol (DHCP) messages.

5 In contrast to the user-settable mobile terminal identifier described earlier, the 'mobile terminal unique identifier' refers to an identifier which is specific to only one mobile terminal, and which can thus be used to uniquely identify that mobile terminal. This means that no other mobile terminal can have the same unique identifier. In addition, this mobile terminal unique identifier is not user-settable.

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For example, in a Bluetooth ad hoc network, the mobile terminal unique identifier is the Bluetooth device address, which is also known as the Bluetooth device medium access control (MAC) address. In another example, for an IEEE 802.11 WLAN network, the mobile terminal unique identifier is the MAC address. It

15 should be noted that in this conjunction, once the mobile terminal unique identifier is available, which is the case as soon as in the present method the user-settable mobile identifier is used once to deliver content data, it is also possible to send content data associated with the mobile terminal unique identifier to the mobile terminal as well.

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Accordingly, in a further embodiment, the method of delivering content to an ad hoc network mobile terminal provided, further comprises determining content data being associated with the mobile terminal unique identifier.

25 In a second aspect, the invention is directed to a system of delivering content to an ad hoc network mobile terminal. The system comprises a computing device configured to execute the instructions comprising determining from a message including a user-settable mobile terminal identifier the user-settable mobile terminal identifier, determining content data being associated with the user-settable mobile terminal identifier from a database that includes content data for
30 at least the user-settable mobile terminal identifier, and sending the determined

content data to the ad hoc network mobile terminal using an ad hoc communication connection.

5 The term 'computing device' refers to a device which can be configured to execute instructions. For example, this computing device may be, but is not limited to, a central processing unit (CPU), a computer (with or without a monitor), a suitably equipped portable small laptop computer or a suitably equipped mobile terminal.

10 In one embodiment, the system of delivering content to an ad hoc network mobile terminal, comprises the computing device is configured to execute instructions further comprising generating a database search request requesting content data being stored in the database and being associated with the user-settable mobile terminal identifier.

15 In one embodiment, the system of delivering content to an ad hoc network mobile terminal, comprises the computing device is configured to execute instructions further comprising generating a request requesting for additional available content data, when no content associated with the user-settable mobile terminal
20 identifier is available.

In one embodiment, the system of delivering content to an ad hoc network mobile terminal, comprises the computing device is configured to execute instructions further comprising preventing the resending of content data that had been
25 previously sent to the ad hoc network mobile terminal.

In one embodiment, the system of delivering content to an ad hoc network mobile terminal, further comprises a transmitter, which provides an ad hoc communication connection between the computing device and the mobile
30 terminal. In addition, the transmitter is further connected to the computing device.

It is possible to configure the system provided with the transmit and receive paths being provided by two separate devices or by a single device. In the first case, the transmitter only provides the transmit path from the computing device to the mobile terminal, and the corresponding receive path may be provided by a separate receiving device. In the second case, the transmit and receive paths are provided by a single device, namely, the transceiver. Accordingly, in one embodiment, the transmitter is a transceiver.

In one embodiment, the system of delivering content to an ad hoc network mobile terminal, further comprises a database which stores content data.

In one embodiment, the database further comprises stored information that associate the content data sent with the user-settable mobile terminal identifier.

In one embodiment, the database further comprises stored information that associate the content data sent with the user-settable mobile terminal identifier and the mobile terminal unique identifier.

In one embodiment, the system of delivering content to an ad hoc network mobile terminal, further comprises a network server which controls the activities of the computing device.

Besides controlling the activities of the computing device, the network server can also perform other functions, such as monitoring the activities of the computing device, collecting statistics, uploading to and downloading data from the computing device, and updating the interactions between computing devices.

In addition, the network server has a communication connection to the computing device. This communication connection may be over one or more communication networks, which may include public switched telephone network (PSTN), digital subscriber line (DSL), local area network (LAN), 3G, WiFi or WiMax.

With regard to the database used herein, in one embodiment, the database may be located in the network server or in the computing device.

- 5 In a third aspect, the invention is directed to a computing device, for delivering content to an ad hoc network mobile terminal, configured to execute the instructions comprising determining from a message including a user-settable mobile terminal identifier the user-settable mobile terminal identifier, determining content data being associated with the user-settable mobile terminal identifier
10 from a database that includes content data for at least the user-settable mobile terminal identifier, and sending the determined content data to the ad hoc network mobile terminal using an ad hoc communication connection.

15 Illustrative embodiments of the invention are explained below with reference to the following drawings.

Figure 1 shows a system implementing the method of delivering content to an ad hoc network mobile terminal according to an embodiment of the invention.

- 20 Figure 2 shows the first part of a flow diagram for a method of delivering content to an ad hoc network mobile terminal according to an embodiment of the invention.

- 25 Figure 3 shows the second part of a flow diagram for a method of delivering content to an ad hoc network mobile terminal according to an embodiment of the invention.

- 30 Figure 4 shows the third part of a flow diagram for a method of delivering content to an ad hoc network mobile terminal according to an embodiment of the invention.

Figure 5 shows the fourth part of a flow diagram for a method of delivering content to an ad hoc network mobile terminal according to an embodiment of the invention.

5 Figure 6a-f shows example menu screens of a user's mobile terminal during the process of receiving content data according to an embodiment of the invention.

Fig. 1 shows an example of a system 100 implementing the method of delivering
10 content to an ad hoc network mobile terminal 101 according to an embodiment of the invention.

In this embodiment, the system shown comprises a plurality of mobile terminals 101, a plurality of transmitters 103, a plurality of computing devices 105, a
15 network server 107, a data center 109, a network operations center 111, a content design center 113, a content formatting center 115 and a content scheduler 117.

The transmitter 103 provides an ad hoc communication connection between the
20 mobile terminal 101 and the computing device 105. In addition, the transmitter 103 can be connected to the computing device 105 in many ways.

The transmitter 103 may be directly connected to the computing device 105 using an interface port of the computing device. Examples of interface ports
25 which can be used include a serial port, a parallel port or a USB port.

The transmitter 103 may also be connected to the computing device 105 through wired means, for example, directly using a network cable or indirectly using a wired connection via a wired network. Examples of a wired network include an
30 Ethernet network, a Token ring network, an optical fibre network and an IEEE 802.3 network.

In addition, the transmitter 103 may also be connected to the computing device 105 through wireless means, for example, using a WLAN.

- 5 The computing device 105 can also be connected to other computing devices, via a LAN connection, for example.

The computing device 105 is further connected to a network server 107. Again, the connection here may be a wired or a wireless connection. Examples of wired
10 and wireless connections could be similar to the network connections from the transmitter 103 to the computing device 105, described earlier.

In addition, the network server 107 is connected to at least one computing device.

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The data center 109, the network operations center 111, the content design center 113, the content formatting center 115 and the content scheduler 117 can also be included in the system provided by the invention, as shown in **Fig. 1**.

- 20 The method provided in this invention is also be further described by the flowchart of **Figs. 2, 3, 4 and 5**.

Fig. 2 shows the first part of a flow diagram for a method of delivering content to an ad hoc network mobile terminal according to an embodiment of the invention.

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As an initial step 201, when a mobile terminal 101 is detected by the transmitter 103 of the ad hoc network, a series of communication messages are exchanged between the mobile terminal 101 and the transmitter 103. Following this, the computing device 105 receives the mobile terminal unique identifier of the mobile
30 terminal 101 from the transmitter 103.

The computing device 105 will then send a request message to the mobile terminal 101 to obtain its user-settable mobile terminal identifier via the transmitter 103, in step 203. In step 205, the computing device 105 determines the user-settable mobile terminal identifier from the response message from the mobile terminal. This forms part of a step of the method provided, which is determining from a message including a user-settable mobile terminal identifier the user-settable mobile terminal identifier.

In step 207, the computing device 105 compares the user-settable mobile terminal identifier against a list of predefined keywords.

Fig. 3 shows the second part of a flow diagram for a method of delivering content to an ad hoc network mobile terminal according to an embodiment of the invention.

Step 301 follows after step 207. In step 301, the computing device 105 determines whether the user-settable mobile terminal identifier matches a predefined keyword up to a predetermined matching degree.

If a match is found in step 301, then the computing device 105 generates a database search request requesting content data being stored in the database and being associated with the user-settable mobile terminal identifier. In other words, in step 303, the computing device 105 searches the database for content data associated to the matching keyword identified in step 301. Here, the search process may find more than one content data associated to the matching keyword, if available. All content data found is selected for further processing.

Steps 207, 301 and 303 form part of a step of the method provided, which is determining content data being associated with the user-settable mobile terminal identifier from a database that includes content data for at least the user-settable mobile terminal identifier.

On the other hand, if no match is found in step 301 (i.e., no content associated with the user-settable mobile terminal identifier is available), then the computing device 105 generates a request requesting for additional available content data.

5 In other words, in step 305, the computing device searches the database for any additional content data that can be sent to the mobile terminal 101. The additional content data which may be sent under step 305, includes, for example, instructions on how to use this invention, or other content data which may be deemed useful to the user of the mobile terminal 101.

10

If such content data is found in the database in step 305, all such content data found is selected for further processing (step 307). Similar to step 301, it is possible that the search process may find more than one content data.

15 The computing device 105 then determines whether the selected content data has been previously sent to the mobile terminal 101 (step 309). This first part of this step involves using the unique identifier of the mobile terminal to determine the content data that had been previously sent to this mobile terminal 101. The next part of this step involves determining whether the selected content data had
20 not been previously sent or not.

If it is determined that the selected content data had not been previously sent to the mobile terminal 101 in step 309, this means that the selected content data will be sent to the mobile terminal 101 for the first time. The next step of
25 processing is step 401, which will be described subsequently.

If it is determined that the selected content data had been previously sent to the mobile terminal 101 in step 309, then the computing device 105 determines whether the mobile terminal 101 was using the same user-settable mobile
30 terminal identifier when it was last detected by the transmitter 103 (step 311).

If it is determined that the mobile terminal 101 was using the same user-settable mobile terminal identifier when it was last detected by the transmitter 103 in step 311, then the computing device 105 records the user-settable mobile terminal identifier and associate it with its mobile terminal unique identifier in the database in step 313. Subsequently, the mobile terminal 101 is disconnected from the transmitter 103 in step 315.

However, in step 311, if it is determined that the mobile terminal 101 was not using the same user-settable mobile terminal identifier when it was last detected by the transmitter 103, this means that the selected content data had been sent to the mobile terminal 101 some time ago, but was not sent the last time the mobile terminal 101 was detected.

Step 311 is provided to give users the opportunity to receive again a previously received content data which, for instance, they had deleted. This is done through the processing path following a negative result from step 311.

However, in the case of a negative result from step 311, the selected content data can also be content data not associated with the user-settable mobile terminal identifier, which is the additional content data that can be sent to the mobile terminal including instructions on how to use this invention. In order to prevent sending such content data repeatedly, step 317 is performed next to determine whether the selected content data is associated to the user-settable mobile terminal identifier.

In step 317, the computing device 105 reads the result of step 301 performed earlier to determine whether the user-settable mobile terminal identifier matches a predefined keyword. From the processing steps described earlier, it can be seen that if the user-settable mobile terminal identifier matches a predefined keyword, then the selected content data is associated to the user-settable mobile terminal identifier.

If it is determined that the user-settable mobile terminal identifier matches a predefined keyword in step 317, the next step of processing is step 401, which will be described subsequently.

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If it is determined that the user-settable mobile terminal identifier does not match a predefined keyword in step 317, the next step of processing is step 313 described earlier.

- 10 Steps 309, 311 and 313 are the steps associated with preventing the resending of content data that had been previously sent to the ad hoc network mobile terminal 101. In this regard, steps 309 and 311 can be considered as the steps involved with maintaining a historical record of content data sent to all mobile terminals previously detected, and step 313 can be considered as the step
15 involved with determining with the use of the said historical record whether the content data to be sent had been previously sent or not.

Fig. 4 shows the third part of a flow diagram for a method of delivering content to an ad hoc network mobile terminal according to an embodiment of the invention.

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- Step 401 is carried out when either a negative result is returned from either step 309 or when a positive result is returned from step 317. The negative result from step 309 indicates the selected content data will be sent to the mobile terminal 101 for the first time. On the other hand, the positive result from step 317 means
25 that the selected content data had been sent to the mobile terminal 101 some time ago, but was not sent the last time the mobile terminal 101 was detected and that the last time terminal 101 was detected it had a different user settable terminal identifier and that this selected content data is associated with the user-settable mobile terminal identifier. Therefore, the selected content data at step
30 401 is the content data that will be sent to the mobile terminal.

In step 401, the computing device 105 records the user-settable mobile terminal identifier and associates it with its mobile terminal unique identifier in the database. The computing device 105 then sends the selected content data to the mobile terminal 101 via the transmitter 103 in step 403.

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Next, in step 405, the computing device 105 determines whether the mobile terminal 101 has accepted the content data or not.

10 In step 405, if the computing device 105 determines that the mobile terminal 101 did not accept the content data, then the mobile terminal 101 is disconnected from the transmitter 101 (step 411).

15 If it is determined in step 405 that the mobile terminal 101 has accepted the content data, the content data will continue to be sent (step 407). The mobile terminal 101 is also monitored and checked if it is disconnected (step 409).

If the mobile terminal 101 is disconnected, then the transmitter 103 terminates the connection to the mobile terminal 101 on its side (step 411).

20 In step 409, if the mobile terminal 101 is not disconnected, the computing device 105 checks if content data is still being sent (step 413). If content data is still being sent, then further processing continues at step 407, until all content data has been sent or until the mobile terminal 101 is disconnected.

25 Steps 403, 405, 407 and 413 form part of a step in the method provided, which is sending the determined content data to the ad hoc network mobile terminal using an ad hoc communication connection.

30 If it is determined that content data is not being sent anymore in step 413, this means that all content data has been sent. In this case, the computing device

105 records in the database with the selected content data sent associated with the mobile terminal unique identifier, in step 415.

5 **Fig. 5** shows the fourth part of a flow diagram for a method of delivering content to an ad hoc network mobile terminal according to an embodiment of the invention.

10 Step 501 continues from step 305, where it is determined that there is no content data to be sent to the mobile terminal 101, when its user-settable mobile terminal identifier does not match any predefined keyword. In step 501, the computing device 105 records the mobile terminal user-settable identifier and associates it with the mobile terminal unique identifier in the database. Following this step, the mobile terminal 101 is then disconnected from the transmitter 103 in step 503.

15 Several embodiments of how the invention can be used are given next.

20 As a first example, if the mobile terminal user is near a cinema and would like to receive information on movies being shown there, the mobile terminal user may change the user-settable identifier of his/her mobile terminal to 'MOVIE' or 'CINEMA'. When this mobile terminal user enters the ad hoc network hotspot area of the cinema and his/her mobile terminal is detected by an ad hoc network transmitter, he/she will receive content, such as downloadable movie trailers or the schedule of the movies playing at the cinema.

25 While the benefits of using this invention to mobile terminal users are obvious, as shown in this example, service providers such as cinema operators and films distributors can also use this invention to promote movie ticket sales, for example.

30 As a second purely illustrative example, at pop concerts, artistes could promote their CDs by allowing concert-goers to select and download excerpts of music

tracks to their mobile terminals. In order to do this with this invention, mobile terminal users could select the tracks they want by changing the user-settable identifier of his/her mobile terminal to the first two words of the song title, for example.

5

As a third example, a Bluetooth enabled mobile terminal could be used to obtain needed information. For example, bus information on how the user could get to his chosen destination, say for example, '10 Orchard Road' in Singapore.

- 10 In this case, a Bluetooth hotspot area could be set up in the area where the user is currently at. In addition, information on how to use the invention could be made available, say, on posters put up within the hotspot area. Also, information on how to obtain bus information for a destination, for example, could be shown on these posters. Accordingly, once provided with the necessary information, the
- 15 user can proceed to set the user-settable mobile terminal identifier on his mobile terminal to '10 Orchard Road'.

- Firstly, the user selects the menu for his mobile terminal (see **Fig. 6a**). The selection of the "Connectivity" option will lead to another menu screen with
- 20 "Bluetooth" as one of the options available. The selection of the "Bluetooth" option, will lead to the menu screen shown in **Fig. 6b**.

In the menu screen example shown in **Fig. 6b**, the following options are set first:

- "Bluetooth" option is selected to be "On", and
- 25 - "My Phone's Visibility" option is selected to be "Show".

- Next, the field next to "My Phone's Name" option showing 'T250' (original value) is selected (see **Fig. 6b**). The screen shown in **Fig. 6c** appears. Here, 'T250' is replaced by '10 Orchard Road'. When the "OK" button is selected, the screen of
- 30 **Fig. 6d** appears. So doing, the user-settable mobile terminal identifier has been changed to '10 Orchard Road'. This example also illustrates the user-settable

mobile terminal identifier as a phrase containing a number and 2 words, '10 Orchard Road'.

Next, when the change in the user-settable mobile terminal of this user's mobile
5 terminal is detected, the user-settable mobile terminal identifier is determined
from a message exchanged between his mobile terminal and the network. Then,
the content data being associated with the user-settable mobile terminal identifier
is determined from a database. Finally, the determined content data, which in this
case is the bus information content data, is sent to the user's mobile terminal.
10 The user can then select "YES" in the prompt corresponding to the content
received on his mobile terminal, in order to receive the bus information content
data.

The user's mobile terminal next receives a prompt (**Fig. 6e**). After the user
15 selects the "YES" option, the mobile terminal receives the file containing the
requested information. Depending on the model of the mobile terminal, this file is
stored in either the mobile terminal's text message inbox or "my pictures" inbox (if
the file received is a picture file, such as a JPEG or a GIF file). Finally, **Fig. 6f** is
an example showing how the content data may appear on the user's mobile
20 terminal with regard to the request for bus information.

In this example, the label given to the user-settable mobile identifier is "My
Phone's Name". Different mobile terminal models can have other labels.
Likewise, different mobile terminal models can also have other variations to what
25 is shown in **Figs 6a-f**. For example, in **Fig. 6e**, the "YES" option is selected to
accept the download. In other mobile terminal models, instead of a "YES" option,
some may have an "Accept" option or a "Grant" option.

The earlier description is presented for purposes of illustration and description.
30 It is not intended to be exhaustive or to limit the invention to the precise form
disclosed, and obviously many modifications and variations are possible in light

of the disclosed teaching. The described embodiments are chosen in order to best explain principles of the invention and its practical application to thereby enable others skilled in the art to best utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. It is intended that the scope of the invention be only defined by the
5 claims appended hereto.

Claims

What is claimed is:

- 5 1. A method of delivering content to an ad hoc network mobile terminal, comprising:
 - determining from a message including a user-settable mobile terminal identifier the user-settable mobile terminal identifier;
 - determining content data being associated with the user-settable
 - 10 mobile terminal identifier from a database that includes content data for at least the user-settable mobile terminal identifier; and
 - sending the determined content data to the ad hoc network mobile terminal using an ad hoc communication connection,
 - wherein the user-settable mobile terminal identifier is the Bluetooth
 - 15 device name in the case of Bluetooth being the ad hoc network, or the corresponding mobile terminal identifier in the respective ad hoc network.
2. The method of claim 1, further comprising generating the message including a user-settable mobile terminal identifier.
- 20 3. The method of claim 2, the generating the message comprising inputting the user-settable mobile terminal identifier by the user.
4. The method of claim 3, the generating the message comprising
- 25 arranging the user-settable mobile terminal identifier into the message body or the message header of the message.
5. The method of claim 4, the generating the message comprising arranging the user-settable mobile terminal identifier into the ad hoc network
- 30 mobile terminal identifier field of the message body.
6. The method of any of claims 1-5, the message being a communication connection setup message.

7. The method of any of claims 1-6, the determining content data comprising matching a predefined keyword associated with the content data to the user-settable mobile terminal identifier, up to a predetermined matching degree.

5

8. The method of any of claims 1-7, further comprising generating a database search request requesting content data being stored in the database and being associated with the user-settable mobile terminal identifier.

10

9. The method of any of claims 1-8, further comprising generating a request requesting for additional available content data, when no content associated with the user-settable mobile terminal identifier is available.

15

10. The method of any of claims 1-9, further comprising preventing the resending of content data that had been previously sent to the ad hoc network mobile terminal.

11. The method of any of claims 1-10, further comprising
20 determining from a message including a mobile terminal unique identifier the mobile terminal unique identifier.

12. The method of any of claims 1-11, further comprising
25 determining content data being associated with the mobile terminal unique identifier.

13. The method of any of claims 1-12, wherein the mobile terminal is a portable communication device.

14. The method of any of claims 1-13, the ad hoc network being one
30 of the following networks: Bluetooth, HIPERLAN, HIPERLAN2, or a IEEE 802 wireless network.

15. A system of delivering content to an ad hoc network mobile terminal, comprising:
- a computing device configured to execute the instructions comprising:
 - determining from a message including a user-settable mobile terminal identifier the user-settable mobile terminal identifier;
 - determining content data being associated with the user-settable mobile terminal identifier from a database that includes content data for at least the user-settable mobile terminal identifier; and
 - sending the determined content data to the ad hoc network mobile terminal using an ad hoc communication connection,
 - wherein the user-settable mobile terminal identifier is the Bluetooth device name in the case of Bluetooth being the ad hoc network, or the corresponding mobile terminal identifier in the respective ad hoc network.
16. The system of claim 15, wherein the computing device is configured to execute instructions further comprising generating a database search request requesting content data being stored in the database and being associated with the user-settable mobile terminal identifier.
17. The system of any of claims 15-16, wherein the computing device is configured to execute instructions further comprising generating a request requesting for additional available content data, when no content associated with the user-settable mobile terminal identifier is available.
18. The system of any of claims 15-17, wherein the computing device is configured to execute instructions further comprising preventing the resending of content data that had been previously sent to the ad hoc network mobile terminal.
19. The system of any of claims 15-18, wherein the computing device is a central processing unit (CPU).

20. The system of any of claims 15-19, further comprising at least one transmitter which provides an ad hoc communication connection between the computing device and the mobile terminal.

5 21. The system of claim 20, wherein the at least one transmitter is a transceiver.

22. The system of any of claims 20-21, wherein the transmitter is further connected to the computing device.

10

23. The system of any of claims 15-22, further comprising a database which stores content data.

24. The system of claim 23, wherein the database further comprises stored information that associate the content data sent with the user-settable mobile terminal identifier.

15

25. The system of claim 24, wherein the database further comprises stored information that associate the content data sent with the user-settable mobile terminal identifier and the mobile terminal unique identifier.

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26. The system of any of claims 15-25, further comprising a network server which controls the activities of the computing device.

25 27. The system of claim 26, wherein the network server has a communication connection to the computing device.

25

28. The system of any of claims 23-25, wherein the database is located in the network server or in the computing device.

30

29. The system of any of claims 15-28, wherein the mobile terminal is a portable communication device.

30. The system of any of claims 15-29, the ad hoc network being one of the following networks: Bluetooth, HIPERLAN, HIPERLAN2, or a IEEE 802 wireless network.

5 31. A computing device, for delivering content to an ad hoc network mobile terminal, configured to execute the instructions comprising:
 determining from a message including a user-settable mobile terminal identifier the user-settable mobile terminal identifier;
 determining content data being associated with the user-settable
10 mobile terminal identifier from a database that includes content data for at least the user-settable mobile terminal identifier; and
 sending the determined content data to the ad hoc network mobile terminal using an ad hoc communication connection,
 wherein the user-settable mobile terminal identifier is the Bluetooth
15 device name in the case of Bluetooth being the ad hoc network, or the corresponding mobile terminal identifier in the respective ad hoc network.