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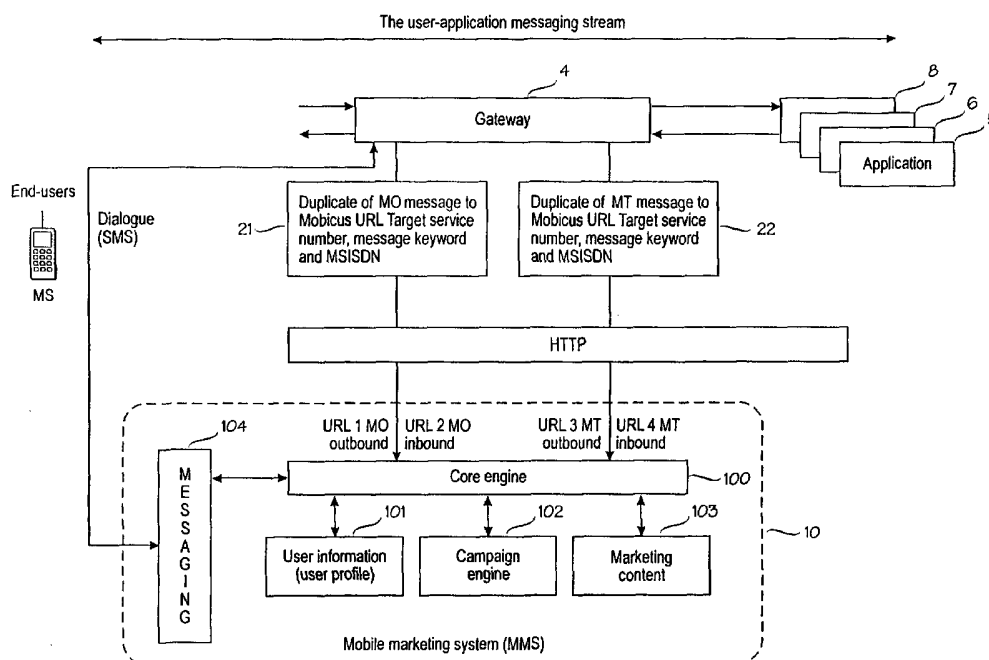
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[Continued on next page]

(54) Title: A SYSTEM AND A METHOD FOR GENERATING PERSONALIZED MESSAGES



(57) Abstract: User-application messaging streams communicated between mobile stations (MS) of end-users and messaging applications (5 to 8) via a messaging gateway (4) are monitored by a mobile marketing system (10). The mobile marketing system utilizes this information as part of a message personalization process for creating and sending personalized marketing messages to the mobile stations.



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A SYSTEM AND A METHOD FOR GENERATING PERSONALIZED MESSAGES

FIELD OF THE INVENTION

5 The present invention relates to techniques for targeted marketing, and particularly to producing personal messages to users in telecommunications systems.

BACKGROUND OF THE INVENTION

10 The modern mobile communications systems are well suited for interactive mobile marketing campaigns. Especially the messaging services, such as the short message service (SMS) is widely used for mobile marketing, although also other methods and protocols, such as HTTP, e-mail and WML can be used. Mobile service providers, such as mobile service operators and mobile portals, offer marketing messages to client companies (marketers) as a service. The
15 mobile service provider benefits from the increased revenue generated by marketing messages, paid for either by end-users or marketers, or both. The mobile messaging also introduces a cost effective marketing channel to be used in the mobile service providers' own marketing. The service provider can market content and services, as well as tailor and personalize existing services.
20 Furthermore, the marketing content itself can be seen as value adding. The marketers' benefit from introducing a new medium that allows them to engage target customers in a personal dialogue at a time most convenient for the consumer. The consumer can use his or her personal mobile terminal for accessing right-time, right-place marketing content.

25 A challenge in a personal and timely mobile marketing dialogue is to personalize messaging content in order to make the content more personally appealing to the customers and to engage the customers in the dialogue. A general objective is the optimization of mobile operator interaction based on contextual variables, e.g. message content, user profile or user situation and
30 location.

BRIEF SUMMARY OF THE INVENTION

 An object of the present invention is an improved marketing message personalization based on substantially real-time knowledge of customer behavior.

The object is achieved by the present invention disclosed in the attached independent claims. Preferred embodiments of the invention are disclosed in the attached dependent claims.

5 The basic idea of the present invention is to monitor a user messaging traffic to one or more messaging application within a mobile operators system and use this information as part of the message personalization process. The information on the use of message applications on the mobile operators system is of great utility and importance for the marketing, selling and cross-selling of value-added services (VAS) over the operator's network. The customers can engaged in
10 a marketing dialogue on the basis of their usage behavior of services offered through their mobile network. The messaging content can be immediately personalized so that it optimally matches the usage context.

In an embodiment of the invention user profiles are created and/or modified on the basis of the usage information obtained by monitoring the traffic
15 between a telecommunications terminal of the user and one or more messaging applications. The basic user profile may have been predefined on the basis of information given by the user when he or she registers to the marketing service, one of the messaging applications, and/or to the mobile network. The present invention enables to update, enrich and/or change the user profile according to the
20 nature of the monitored message communication. The marketing messages can then be personalized in real-time based on the continuously updated user profile as well as user action and behavior.

According to an embodiment of the invention, personalized messages are delivered to users at an optimal time in relation to the application usage
25 session. For example, the usage variables obtained by the monitoring according to the invention together with other user profile information can be utilized in creating rules that can optimize user interaction in real-time. For instance, the message personalizing process may react on user "time out" and effectively create and implement an optimized time-to-interact messaging process. For example, the end
30 of the monitored message communication may be detected and a personalized message may be sent after a predetermined period of time after the detected end of the communication.

In an embodiment of the present invention, the monitoring of the communication includes a direct monitoring of the messaging applications. This
35 means that the monitoring means have a connection to or are associated with the individual messaging applications, such as VAS applications. However, also in this case the present invention results in a universal messaging personalization solution that does not need tailoring of individual VAS applications. This is an

advantage over a solution wherein the information on usage of a messaging application would be independently generated in the specific application and dispatched to the message personalizing process. This alternative way to process usage information would be costly and not always feasibly based on the technical specifications of each messaging application.

In a further embodiment of the invention, the monitoring means according to the invention are connected only to one point in the mobile operator's infrastructure. Most preferably this is an intermediate network node that relays the messaging between mobile users and messaging applications. A typical example of the connection point is a messaging gateway or messaging centre in the mobile infrastructure. This approach allows implementation of the present invention independently of individual messaging applications. No connections are then needed between the individual applications and them monitoring means. This allows to readily and in a flexible manner to add new messaging applications to or remove them from the network and/or the message personalization process.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments of the invention will be now described in more detail with reference to the accompanying drawings, in which

Figure 1 illustrates an example of introducing a mobile marketing system according to the present invention into a mobile communications system, and

Figure 2 is a block and flow diagram illustrating the monitoring and message personalization process according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figure 1, a public land mobile network 1 offers to mobile user a messaging service, such as short message service (SMS), wireless application protocol (WAP), unstructured supplementary service data (USSD), etc. As used herein, the messaging service means any interactive service which offers user-to-user communication between individual parties via messaging service units with store-and-forward, mailbox and/or message handling functions, e.g. information editing, processing and conversion functions.

The SMS is well known from the GSM (Global System for Mobile Communication) for example. Short message service centre (SMSC) is a network element through which short messages are transmitted and in which they can be stored for later transmission if the receiver is not reached. According to the GSM specifications, the SMSC is not a functional part of the GSM PLMN, although in

practice it is often physically integrated into the GSM PLMN. For example, the SMSC and the mobile services switching centre (MSC) may be integrated. When the SMSC provides a gateway to other networks or applications it is also often called a MS gateway (SMS GW). The SMS GW typically contains interworking and conversion function between different messaging protocols.

Also the USSD is a service that provides the means to carry textual information between a mobile subscriber and an application in the network. In contrast to the SMS, which is basically a store-and-forward service, the USSD offers a real-time connection during a session. The direct radio connection stays open until the user or the application disconnects. The USSD centre (USSDC) is a messaging centre or gateway that provides the means for carrying the USSD messages between a mobile subscriber and an application in the network.

The WAP specifies an application framework and network protocols for wireless devices, such as mobile phones, for accessing web service in the Internet. WAP defines a set of standard components that enable communication between mobile terminals and web servers. WAP content and applications are created by wireless mark-up language, WML, which is a language very similar to the hyper text mark-up language (HTML) and utilized for creating WAP pages that can be viewed by a WAP browser, i.e. a micro browser in the wireless terminal, which is analogous to a standard web browser. A WAP gateway is located between the PLMN and the applications or other networks, such as the Internet. The WAP gateway, also called a WAP filter, may carry out translation between WAP requests/responses and WWW requests and responses thereby allowing a WAP browser in a WAP terminal to submit requests to a WWW server in the Internet. Also a translation of the content may be carried out (e.g. between the WML and HTML languages).

In Figure 1, the messaging gateway 4 may be any type of messaging centre or gateway needed for any specific messaging service of the PLMN 1 for providing means for carrying messages between mobile subscribers and messaging applications 5, 6, 7 and 8 in the network. The invention is not restricted to any specific messaging methods, although the messaging monitoring according to the present invention is especially useful in SMS and USSD type messaging in which the monitoring of usage of the messaging applications is otherwise difficult to implement.

The messaging applications 5 to 8 can be any applications available to the mobile subscriber by means of the messaging services. The applications offered may be, for example, information services (news, stock rates, etc.) or entertainment (e.g. games). It will be appreciated that the nature of a messaging

application 5 to 8 is not relevant to the present invention but the invention can be used with any such applications.

Further, the applications 5 to 8 may be integrated into the messaging gateway, or connected to the messaging gateway via direct connections, operator's local area network (LAN), such as Intranet, or via public data network, such as the Internet. All these alternatives are generally designated by the reference numeral 2 in Figure 1. Further, the messaging or transfer protocol employed between the messaging gateway 4 and the applications 5 to 8 is not relevant to the present invention.

Similarly, a mobile marketing system (MMS) 10 or 11 is integrated to or associated with the messaging gateway 4 (such as the MMS 11), or connected thereto by means of the operator's LAN, direct connections, or public data network (all these alternatives being designated by the reference numeral 2) in a similar manner as the MMS10 in Figure 1. The MMS10 may be located in the extranet segment of a client company (marketer) or a mobile service provider. In a preferred embodiment of the invention, the MMS is a WAP based tool for design, implementation and monitoring of marketing campaigns. It may allow for the design and monitoring of marketing campaigns over the Internet 3 with a web browser. The marketing system MMS10 preferably communicates with end-users MS1, WS1 and WS2 via various messaging and communication protocols and services, such as the SMS, HTTP, or e-mail.

According to the present invention, the MMS10 or 11 is able to monitor the user traffic to the applications 5 to 8 and use this information as part of the message personalization process. In a preferred embodiment of the invention the messaging stream is monitored directly from the messaging gateway 4. The advantage of this embodiment is that no connection is needed between any individual one of the applications 5 to 8 and the MMS10, which results in that the monitoring can be independent of the applications. However, another embodiment of the invention employs direct monitoring of applications via direct connections between the individual application and the MMS10, as illustrated by dashed line 9 in Figure 1.

An example of monitoring and processing the user traffic from the gateway 4 is illustrated in Figure 2. The user-application messaging stream is communicated between the mobile stations MS of the end-users and the applications 5 to 8 via the messaging gateway 4. As depicted in Figure 2; in-bound and out-bound messages that are mobile originated messages (MO) are duplicated (block 21) and transferred as a HTTP GET request to an URL (Uniform Resource Locator) of the MMS10. The HTTP request includes the original

message, the MSISDN and a target service number. In Figure 2, URL1 is allocated for MO out-bound messages, and URL2 for the MO in-bound messages. The messages to be duplicated from the messaging stream are identified on the basis of the message keyword identifying the application 8-8, and the mobile station IDN number of the end-user. The message keywords and the MSISDNs can also be used for selecting the code URL target service number 1 to 4 in the MMS10. Similarly, in-bound and out-bound messages that are mobile terminated (MT) are duplicated (22) via the HTTP protocol to the URL addresses i.e. the URL target service numbers URL3 and URL4, respectively.

Figure 2 illustrates also an example of the mobile marketing system (MMS) 10. The MMS10, preferably implemented as a server in a computer, contain following functional elements: a core engine 100, a user information database 101, marketing servlets 102, a marketing content 103, and a messaging system 104. Generally, the core engine 100 connects to the marketing campaign content 103, which is preferably stored in XML format, and developes it into personalized, highly situational marketing messages by accessing to the user information database 101 according to specific rules. The rules and campaign actions may be defined with a browser based administrative toolset (not shown). The marketing content 103 that is stored in XML format in the preferred embodiment, may contain, in addition to text and images to be presented to the customers, also specifications required to direct the operation of the campaign. The campaign or marketing servlets 102 are applications that interpret the campaign content and rules stored in the database. In the preferred embodiment of the invention, each campaign type is defined using a different XML structure, and each of these campaign types requires a different campaign servlet for operating the campaign. The user information 101 will preferably have an entry for every identified user accessing the marketing content. The basic information, such as the user's mobile phone number is obtained from the registration procedure. The user information 101 stores also customer information obtained by the monitoring process according to the present invention. This information may relate to the messaging sessions of the customer, such as the duration of each user session, which is determined by recording the time a session begins and ends. This information obtained by the monitoring may be used in the profiling and classification of the users. For example, on the basis of the session information, a user may be classified as a "first timer", "returning user", "continuous user", or a "heavy user".

The purpose of marketing rules is usually either to profile customers or to send situation-specific marketing messages to specified customers. For

example, a rule may be defined that automatically sends loyalty strengthening offers to registered customers who have been classified as passive. Marketing rules are built by specifying triggers and actions. The triggers are trigger conditions that initiate actions. A trigger condition may be, for example, that a user has had a specified number of sessions during the last N days. An action initiated by a trigger may be, for example, change user properties (e.g. classifications, or to send SMS messages). Specifications of rules define, for example, the conditions that trigger the rule, the action that follows the triggering, how often or when the condition of the triggers are checked (once a day, at the end of each customer session, on demand, etc.), how many times the rules may be triggered (e.g. once, or as many times as another rule launches the triggering).

It should be appreciated that the MMS10 may acquire information on the interests and behaviour of the customers in various manners, and use this information for modifying the user profiles (e.g. classification, and to personalize the messages). However, it is only relevant to the present invention that the messaging stream between the end users and the applications are monitored. To this end, the core engine 100 receives the duplicated MO and MT messages from the gateway 4. The core engine can be configured to analyse the messages and to derive any information needed. Such information may include, for example, the MSISDN number of the user, the application (service) used, and the start and stop time (or the duration) of the session. This information is then either stored in the user information database 101 or utilized for modifying the user profile of the particular user immediately, depending on the triggers, actions and rules defined for the particular user. Thus, the monitoring according to the invention enables the MMS10 to update and enrich the user profiles based on key identifiers, e.g. MSISDN. The core engine 100 is then able to personalize messaging traffic in real time based on these continuously updated user profiles as well as user action and behaviour. The core engine 100 can utilize the usage variables along with the other user profile information and create new rules (e.g. if...then) that can optimise user interaction in real time. The core engine 100 may, for instance, react on user "time-out" and effectively create and implement an optimised time-to-interact messaging process.

The means for the user dialogue and interaction are provided by the messaging system 10. The messaging system 10 receives the personalized content from the core engine 100 in the XML format, for example. The content is then converted into a message that is in accordance to the message presentation standard used by the end-user. In the preferred embodiment of the invention, the content is converted into a readable SMS, USSD, or WML message. The

conversion is carried out using XML style sheets. When the personalized content has been converted into a personalized message (e.g. SMS), the messaging system sends the personalized message to the mobile station MS of the user.

Let us now examine the personalization process according to the preferred embodiment of the invention by means of an example. The user starts to play a mobile game with a game application 5 in the network by his/her mobile station MS. Playing the game involves exchanging SMS messages between the mobile station MS and the application 5 via the gateway 4. The gateway 4 duplicates all the messages to the MMS10, and thereby the MMS10 is able to monitor all the SMS traffic at the gateway 4. The user is identified on the basis of his MSISDN and his usage behaviour classifies him as a "heavy user", since this is his tenth session within a week. Thus, the trigger is that the user has had ten sessions during the last seven days, and the action is to change the user classification into a "heavy user". A second trigger is a classification of the user as a "heavy user". This second trigger causes the MMS10 to automatically send a well-come message to the heavy user five minutes after the session ends. Therefore, upon observing that the user is heavy user, the core engine 100 creates a content for the well-come message and forwards it to the messaging system 104 five minutes after having detected the end of the session. The messaging system 10 converts the content into a SMS well-come message and sends the SMS message to the mobile station MS. Similarly, any targeted messaging following a user session can be carried out.

In a second example, user accounts are credited based on the registration and usage. The user registers via the Internet to a direct marketing service supported by the MMS10. The service entitles the user to use value-added-services (VAS) for a discounted price if she/he receives a targeted offer at the same time. When the user, by means of his/her mobile station MS, accesses a mobile service in the application 6 via the gateway 4, messages are exchanged between the MS and the application 6. By means of the monitoring according to the present invention, the MS 10 detects that the session has started and checks the user profile for this user on the basis of the MSISDN. The MMS10 observes that the specific user has a right for a discounted price and sends a credit POP (Prove of Purchase) code to a telecom mediation software system (not shown) that allows billing to occur.

The description of the preferred embodiment is made only to illustrate the invention. The invention is not intended to be restricted to these examples but modifications and changes can be made without departing from the scope and spirit of the attached claims.

CLAIMS

1. A method of generating personalized messages to a user of a mobile terminal, **characterized by**
monitoring a message communication between said mobile terminal
5 and one or more messaging applications on a network side,
creating a personalized marketing message for said user on the basis of information obtained by said monitoring,
sending said personalized marketing message to said mobile terminal of said user.
- 10 2. A method as claimed in claim 1, **characterized by**
creating or modifying a user profile for said user on the basis of information obtained by said monitoring,
creating said personalized marketing message for said user according to said user profile.
- 15 3. A method as claimed in claim 1 or 2, **characterized by**
monitoring said message communication in an intermediate network node between said mobile terminal and a network node running said messaging application.
- 20 4. A method as claimed in claim 3, **characterized** in that said monitoring comprises
duplicating messages of said message communication,
forwarding said duplicated messages to a message personalizing application run in said intermediate network node or in another network node.
- 25 5. A method as claimed in any one of claims 1 to 4, **characterized by**
monitoring said message communication in a gateway between a mobile communications network and a packet data network.
- 30 6. A method as claimed in any one of claims 1 to 5, **characterized by**
monitoring said message communication at a messaging service gateway of a mobile communications system.
- 35 7. A method as claimed in claim 6, **characterized** in that said messages are short messages, and said messaging service gateway is a short message centre of a mobile communication system.
8. A method according to any one of claims 1 to 7, **characterized by**
detecting the end of a messaging session between said one or more

messaging application and said user,

sending said personalized marketing message in response to said detection.

5 9. A method according to claim 8, **characterized** by
sending said personalized marketing message after a predetermined period of time from said detection.

10 10. A system for generating personalized messages to a user of a mobile terminal, **characterized** by
means for monitoring a message communication between said mobile terminal and one or more messaging applications on a network side,
means for creating a personalized marketing message for said user on the basis of information obtained from said monitoring means,
means for sending said personalized marketing message to said mobile terminal of said user.

15 11. A system as claimed in claim 10, **characterized** by said means for creating a personalized marketing message further comprising
means for creating or modifying a user profile for said user on the basis of information obtained from said monitoring means,
means for creating said personalized marketing message for said user
20 according to said user profile.

12. A system as claimed in claim 10 or 11, **characterized** by said monitoring means being located in an intermediate network node between said mobile terminal and a network node running said messaging application.

25 13. A system as claimed in claim 12, **characterized** in that said monitoring means further comprises
means for duplicating messages of said message communication,
means for forwarding said duplicated messages to said creating means located in said intermediate network node or in another network node.

30 14. A system as claimed in any one of claims 10 to 13, **characterized** by said monitoring means being located in a gateway between a mobile communications network and a packet data network.

15. A system as claimed in any one of claims 10 to 14, **characterized** by said monitoring means being located in a messaging service gateway of a mobile communications system.

35 16. A system as claimed in claim 15, **characterized** in that said messages are short messages, and said messaging service gateway is a short message centre of a mobile communication system.

17. A system as claimed in any one of claims 10 to 16,

characterized by

means for detecting the end of a messaging session between said one or more messaging application and said user,

5 said sending means being responsive to said detection for sending said personalized marketing message.

18. A system according to claim 17, **characterized by**

said sending means sending said personalized marketing message after a predetermined period of time from said detection.

10 19. A messaging personalization device for generating personalized messages to a user of a mobile terminal, **characterized by**

means for receiving a duplicate of a message communication carried out between said mobile terminal and one or more messaging applications on a network side,

15 means for creating a personalized marketing message for said user on the basis of information obtained from said monitoring means,

means for sending said personalized marketing message to said mobile terminal of said user.

20 20. A device according to claim 19, **characterized** in that said device is a server connected to a data network, such as the Internet, and that said duplicate of said message communication is received from a messaging service gateway relaying said communication between said mobile terminal and said one or more messaging application.

25 21. A device according to claim 19, **characterized** in that said device is in association with a messaging service gateway relaying said communication between said mobile terminal and said one or more messaging application.

22. A device as claimed in claim 20 or 21, **characterized** in that said messages are short messages, and said messaging service gateway is a short message centre of a mobile communication system.

30 23. A computer program product comprising program code means stored on a computer readable medium for performing the method of any one of claims 1 to 9 when the program is run on a computer.

35 24. A computer program product comprising program code means stored on a computer readable medium for performing all the steps of any one of claims 1 to 9 when the program is run on a computer.

Fig. 1

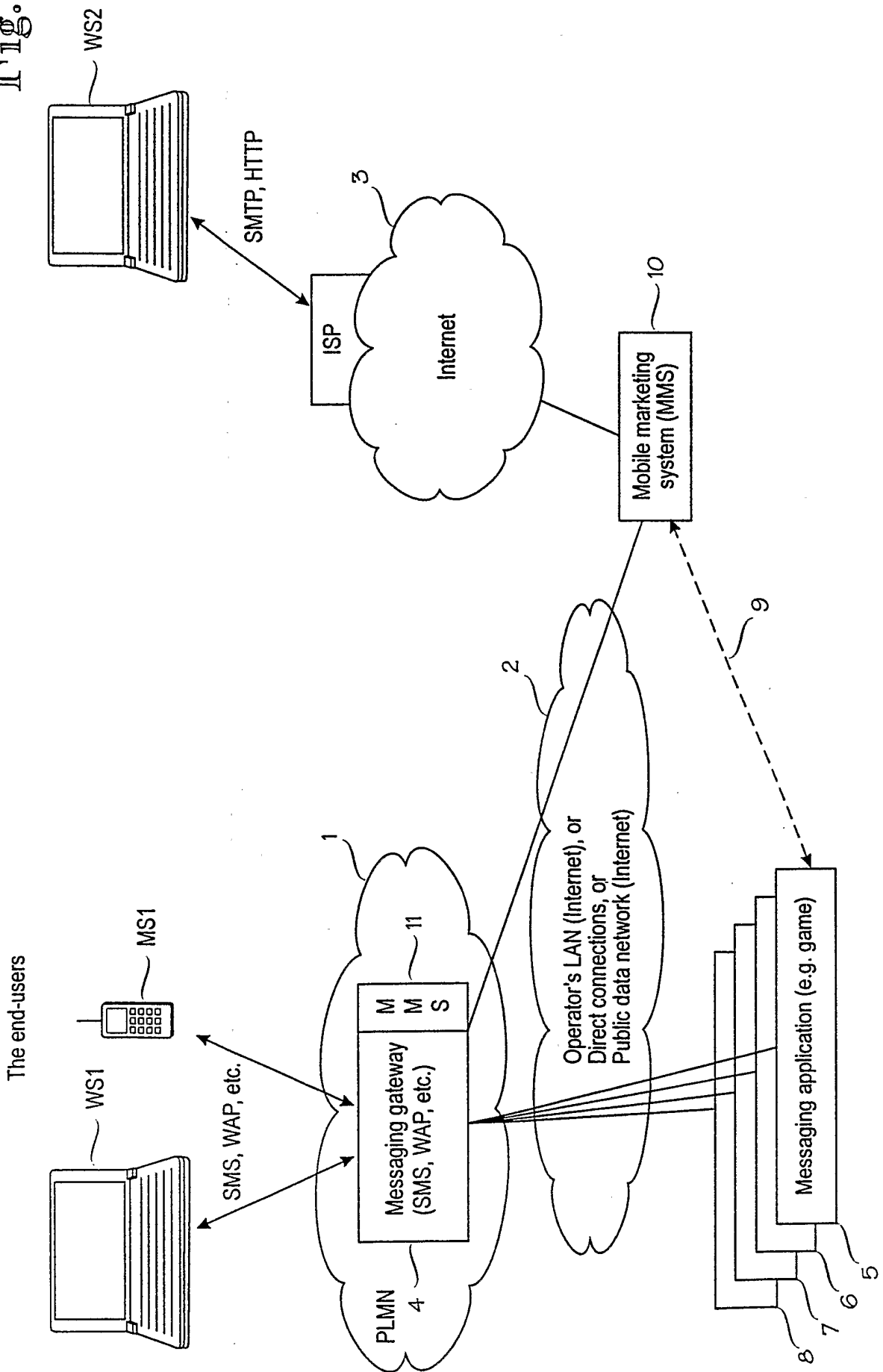
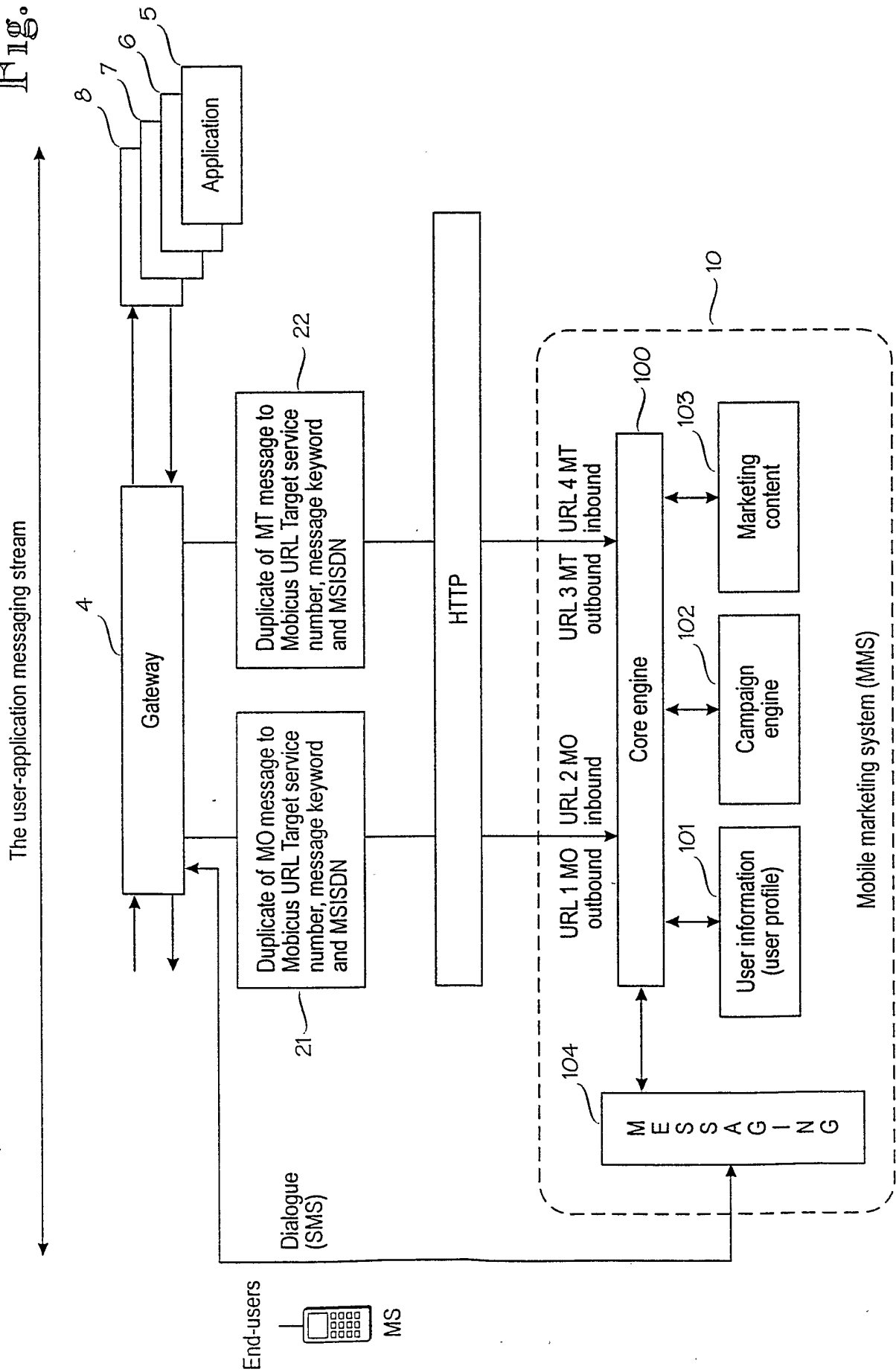


Fig. 2



INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 02/00903

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G06F 17/60, H04Q 7/22

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)

IPC7: G06F, H04Q

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

SE,DK,FI,NO classes as above

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 0052608 A1 (TEL.NET MEDIA PTY. LTD.), 8 Sept 2000 (08.09.00), page 3, line 15 - page 4, line 20; page 5, line 11 - line 25; page 7, line 5 - line 23, claims 1-10, abstract --	1-3,5-7, 10-12,14-16, 19-24
P,X	GB 2369218 A (MAILROUND LIMITED), 22 May 2002 (22.05.02), page 6, line 24 - page 7, line 2; page 9, line 20 - line 30; page 11, line 24 - page 12, line 7, abstract, page 14, line 19 - page 15, line 3 --	1-3,5-7, 10-12,14-16, 19-24
A	WO 0052598 A1 (TEL.NET MEDIA PTY. LTD.), 8 Sept 2000 (08.09.00), page 3 - page 4, abstract --	1-24

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

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"P" document published prior to the international filing date but later than the priority date claimed

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"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

"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

"&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 02/00903

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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P,A	US 6385592 B1 (PAUL D. ANGLES ET AL), 7 May 2002 (07.05.02), abstract -- -----	1-24

INTERNATIONAL SEARCH REPORT

Information on patent family members

30/12/02

International application No.

PCT/FI 02/00903

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