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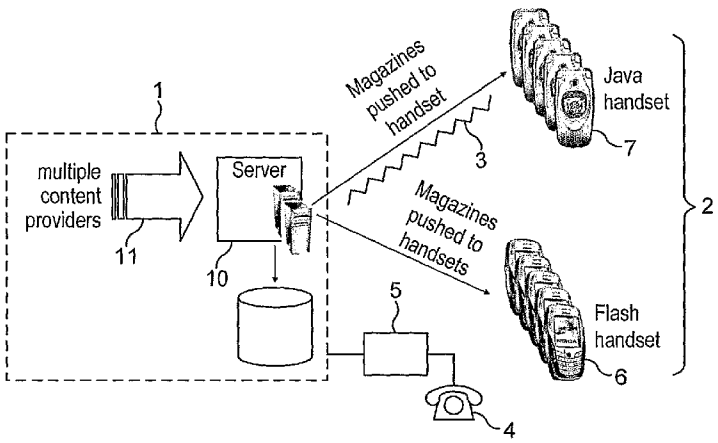
(54) **Title:** SYSTEM AND METHOD PROVIDING CONTENT TO PORTABLE TELEPHONE HANDSETS



(57) **Abstract:** Content is provided to portable telephone handset users by a method comprising the steps of: providing a plurality of pages selected from magazine pages and, optionally, advertising pages to a server coupled to telephone service provider equipment, and transmitting those pages to portable handsets. Transmittal takes place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server. Portable telephone handsets receive and store the pages in memory for subsequent viewing thereof on the handset screen by the handset user. Only those changes made in each page as compared with the same page previously received by the handset following an initial reception of that page are stored and overwritten in the handset memory. There may be a plurality of magazines to which a user may selectively subscribe. The advertising pages may be linked to particular magazine pages for display when the magazine is selected for view. A record of pages viewed may be stored in the handset and transmitted to the server independently of use of the handset for telephone communication and without the knowledge of the user. Selected pages may include a call to action in the form of an automatic link to a communications function of the handset.

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SYSTEM AND METHOD PROVIDING CONTENT TO PORTABLE TELEPHONE HANDSETS

Background

This invention relates to improvements in or relating to telephone communication systems.

Modern portable telephone handsets (in other words: telephones to the current 2.5G and 3G standards, and telephones to the projected future 3.5G/4G standards) are provided with a graphics system that enables transmitted graphics to be displayed on the handset screen. Current handsets with graphics capabilities generally support either Java™ (MIDP) based technology or Macromedia Flash™ based technology or both. A development of Macromedia Flash™ based technology not yet commercially available ports Flash technology to handsets that only have Java capability.

In 2004, the European mobile telephone systems operator T-Mobile began offering subscribers an additional News service that took advantage of the fact that even when such a modern portable handset was not in use for telephone communication, it was still "on", and so could receive signals from the systems operator. The News service was provided in a magazine format. In other words, it consisted of a number of "pages" that could selectively be displayed on screen, each comprising a mix of text and graphics, in a similar manner to web pages on a computer screen, with the difference that, rather than being sent over the Internet from a web server when required by the user, they were transmitted to the handset directly from the telephone systems provider's system server when the handset was "on" but not being used for telephone communication, and stored in the client handset for display when required by the user. The News service could be updated by varying the content of individual pages of the magazine during the day by the network system provider's server communicating with the client user's handset at times when it was not being used for telephone communication.

The present invention is concerned with a number of improvements to and modifications of this kind of system to enable richer content and experiences to the user and extended services of value to the user and to the network provider.

Summary

In general, in a first aspect, a telephone communication system comprises telephone service provider equipment and a plurality of portable telephone handsets each adapted for user controlled connection to the telephone service provider equipment via a wireless connection for telephone communication between the handset and remote telephone equipment via one or more telephone networks; a server coupled to the telephone service provider equipment and provided with memory storing a plurality of magazines, the server being adapted to transmit stored magazines from said memory to portable handsets without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset of the plurality being adapted for user selection of (subscription to) one or more of said plurality of magazines and being adapted to receive and store said selected magazine(s) in a portion of the memory of the said handset for subsequent selective viewing of pages thereof on the handset screen by the handset user at a time of their choosing; each said handset being adapted to selectively store and overwrite in memory only those changes made in each page of the said magazines as compared with the same page of a selected said magazine previously received by the said handset following an initial reception of the said page.

In a related aspect, magazine content is provided to portable telephone handset users by a method comprising the steps of: providing a plurality of magazines to a server coupled to telephone service provider equipment, each magazine comprising a plurality of pages, and transmitting each said magazine from said plurality of magazines from the server to portable handsets of users that have previously selected (subscribed to) that magazine, transmittal taking place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, each portable telephone handset being adapted to receive and store received magazine(s) in memory for subsequent selective viewing of pages thereof on the handset screen by the handset user at a time of their choosing, only those changes made in each page of a said magazine as compared with the same page previously received by the said handset following an initial reception of the said page being stored and overwritten in the handset memory.

Personal digital assistants (PDAs) such as the well known Blackberry® device, while also possessing additional functionality, provide voice communication

over the telephone network in the same manner as conventional modern portable telephone handsets to the 2.5G and 3G and above standards. In their telephone modes, PDAs should be seen as portable telephone handsets, as that term is used herein. In addition, handheld and laptop computers may be provided with a telephone modem and a microphone and loudspeaker so that they can be used for voice communication over the telephone network in the same way as conventional portable telephone handsets. This is to be contrasted with laptops and other personal computers operating under a Voice over Internet Protocol (VoIP) such as the Skype® system, which provide a web-based system rather than a telephone network based system. The term portable telephone handset is to be understood to include handheld and laptop computers when operating in a telephone mode, but not when operating in a VoIP mode.

By a magazine is meant a document comprising one or more pages of text and/or graphics generated by a publisher of the said magazine for transmittal to any portable telephone handset subscribing to the magazine transmittal service.

A magazine may be an electronic version of a printed magazine, or may be a publication provided just for portable telephone handsets. The magazines may be on any topic, and may include news magazines. The magazines may be updated at the server in full, or only in selected pages, and at periodic intervals or at irregular times of the publisher's choosing (for example in a rolling news magazine).

Implementations may include provision for insertion of interstitial advertising on the handset screen between reading by the user of selected pages of stored magazines, in a manner similar to pop-ups on the Internet. Intended interstitial advertising may be stored in an advertising portion of the memory of the server, and the server adapted to transmit the said advertising to portable telephone handsets without user intervention and at times while the handset is "on" that are under the exclusive control of the server. Each said page of interstitial advertising may be linked to a particular page of a particular magazine by a table of associations stored in the server, and each portable telephone handset may be adapted to store the said interstitial advertising in a portion of the handset memory and to display a specific page of interstitial advertising when the user selects the particular said magazine page with which it is linked for view.

In general, in a second and alternative aspect, a telephone communication system comprises telephone service provider equipment and a plurality of portable

telephone handsets each adapted for user controlled connection to the telephone service provider equipment via a wireless connection for telephone communication between the handset and remote telephone equipment via one or more telephone networks; a server coupled to the telephone service provider equipment and being provided with first memory storing a plurality of magazine pages, the server being adapted to transmit stored magazine pages from said first memory to portable handsets without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset of the plurality being adapted to receive and store at least selected said pages in a portion of the memory of the said handset for subsequent selective viewing of said pages on the handset screen by the handset user at a time of their choosing; each said handset being adapted to selectively store and overwrite in memory only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page; the server being provided with second memory storing one or more pages of interstitial advertising, the or each such page being provided with a link to a specific magazine page by a table of associations; the server being adapted to transmit the one or more said pages of interstitial advertising to portable telephone handsets without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset being adapted to store the said interstitial advertising in a portion of the handset memory and to display the or a specific page of the interstitial advertising when the user selects the particular said magazine page with which it is linked for view.

In a related aspect, magazine and advertising content is provided to portable telephone handset users by a method comprising the steps of: providing a plurality of magazine pages to a server coupled to telephone service provider equipment, and transmitting said magazine pages to portable handsets, transmittal taking place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, portable telephone handsets receiving and storing magazine pages in memory for subsequent selective viewing thereof on the handset screen by the handset user at a time of their choosing, only those changes made in each page of a said magazine as compared with the same page previously received by the said handset following an initial reception of the said page being stored and overwritten in the handset memory; providing one or more

pages of interstitial advertising to the server, each advertising page being linked to a specific magazine page by a table of associations; transmitting the or each such advertising page and said table of associations to said portable handsets, transmittal taking place over said one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset storing the advertising pages and table of associations, and displaying the/any advertising page linked to a specific magazine page when a user selects that magazine page for view.

The magazine pages may be pages of one or of a plurality of magazines. Particular pages of interstitial advertising may be provided by the telephone service provider or may be provided by the publisher of the associated magazine page or by an external source.

A portable telephone handset may store a record of particular magazine pages and of particular pages of interstitial advertising displayed on the handset, and the table of associations linking pages of interstitial advertising to particular magazine pages may be varied for a specific handset in accordance with the said record. The record may include the time for which a particular page of magazine or advertising was displayed.

The said record may be transmitted from the handset to the server independently of use of the handset for telephone communication and without the user being aware of such communication, for CRM (customer relationship management) usage by the telephone service provider or by the magazine publisher.

In general, in a third alternative aspect, a telephone communication system comprises telephone service provider equipment and a plurality of portable telephone handsets each adapted for user controlled connection to the telephone service provider equipment via a wireless connection for telephone communication between the handset and remote telephone equipment via one or more telephone networks; a server coupled to the telephone service provider equipment and being provided with a memory storing a plurality of pages selected from magazine pages and advertising pages, the server being adapted to transmit stored pages from said memory to portable handsets without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset of the plurality being adapted to receive and store at least selected said pages in a portion of the memory of the said handset for subsequent viewing of said pages on the handset

screen by the handset user; each said handset being adapted to selectively store and overwrite in memory only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page; each said portable telephone handset storing a record in memory of pages displayed on its handset screen, and being adapted to transmit said record to the server independently of use of the handset for telephone communication.

In a further related aspect, content is provided to portable telephone handset users by a method comprising the steps of: providing a plurality of pages selected from magazine pages and advertising pages to a server coupled to telephone service provider equipment, and transmitting said pages to portable handsets, transmittal taking place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, portable telephone handsets receiving and storing said pages in memory for subsequent viewing thereof on the handset screen by the handset user, only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page being stored and overwritten in the handset memory; each said handset storing an historical record in memory of pages displayed on its handset screen, and being adapted to transmit said record to the server independently of use of the handset for telephone communication.

In implementations, each handset may be adapted to transmit its record when prompted to do so by the server. The record may be erased or overwritten in the handset memory following such transmittal.

Provision may be made for calls-to-action within a magazine or interstitial advertising page by providing a link on that page to the telephone, SMS or e-mail function of the portable telephone handset so that the user may automatically initiate a telephone call, SMS message or e-mail relevant to that page without having to input any telephone number or e-mail address.

In general, in a further alternative aspect, a telephone communication system comprises telephone service provider equipment and a plurality of portable telephone handsets each adapted for user controlled connection to the telephone service provider equipment via a wireless connection for telephone communication between the handset and remote telephone equipment via one or more telephone networks; a server coupled to the telephone service provider equipment and being provided with a memory storing a plurality of pages selected from magazine pages and advertising

pages, the server being adapted to transmit stored pages from said memory to portable handsets without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset of the plurality being adapted to receive and store at least selected said pages in a portion of the memory of the said handset for subsequent viewing of said pages on the handset screen by the handset user; each said handset being adapted to selectively store and overwrite in memory only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page; at least one of the said pages defining a link to a communication capability of portable handsets selected from telephone communication, SMS messaging, e-mail and initiation of an on-line Internet session; and each said handset being adapted so that user selection of a particular said link automatically initiates a telephone call, SMS message or e-mail to a destination defined by the link or initiation of an on-line Internet session with a destination defined by the link.

In a related aspect, content is provided to portable telephone handset users by a method comprising the steps of: providing a plurality of pages selected from magazine pages and advertising pages to a server coupled to telephone service provider equipment, and transmitting said pages to portable handsets, transmittal taking place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, portable telephone handsets receiving and storing said pages in memory for subsequent viewing thereof on the handset screen by the handset user, only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page being stored and overwritten in the handset memory; at least one of the said pages defining a link to a communication capability of portable handsets selected from telephone communication, SMS messaging e-mail and initiation of an on-line Internet session, so that the user may automatically initiate a telephone call, SMS message or e-mail to a destination defined by the link or an online Internet session with a destination defined by the link.

Brief Description of the Drawings

In the accompanying drawings:-

Fig. 1 gives a generalised over-view of an implementation of a telephone communication systems;

Figs. 2 and 3 show screenshots;

Fig. 4 schematically illustrates creation and deployment of magazines;

Fig. 5 schematically illustrates mapping of four different feeds on to four different channels;

Fig. 6 gives feed definition for three channels;

Fig. 7 shows an example of an XML template;

Fig. 8 shows an example of how pictures are obtained;

Fig. 9 schematically illustrates how a client handset is configured;

Fig. 10 is similar to Fig. 9 but with the Event Handler Application expanded to show components;

Fig. 11 schematically illustrates successive steps in performing a synchronisation;

Fig. 12 details actions to be taken when downloading in one example;

Fig. 13 gives details for a compressed independent data package;

Fig. 14 gives details of data download rules for a particular package;

Figs. 15 and 16 show examples of commands from the handset to the server;

Fig. 17 shows the format for usage data;

Fig. 18 shows an example of a call-to-action;

Figs. 19, 20 and 21 show handset screenshots;

Fig. 22 is a schematic illustration similar to Fig. 11 for the adding of a magazine;

Fig. 23 is a schematic illustration similar to Figs. 11 and 22 for an unsubscribe action;

Fig. 24 is a similar illustration for a remove action;

Fig. 25 schematically illustrates one embodiment of server architecture;

Fig. 26 schematically illustrates the magazine builder server included in Fig. 25;

Fig. 27 schematically illustrates the content management system server included in Fig. 25; and

Fig. 28 schematically illustrates the synchronisation/subscription server included in Fig. 25.

Description of Preferred Embodiments

The system of Fig. 1 comprises telephone service provider equipment 1 and a plurality of portable telephone handsets 2, each of which is adapted for user controlled connection to the telephone service provider equipment via wireless connections 3 to allow telephone communication between a particular handset and remote telephone equipment 4 via one or more telephone networks 5.

Many modern portable telephone handsets have a graphics capability. Some may function as still or video cameras in addition to their communications capability. All will have a screen. At present portable telephone handsets have such a graphics capability of one or both of two types. Some handsets 6 are provided with Macromedia Flash™ based graphics capability; while other handsets 7 are provided with Java™ MIDP2 graphics technology. Some handsets possess both such capabilities. A development by Macromedia, not yet commercially available, can port Flash technology to handsets that only have Java capability. As will be explained below, our systems push magazine pages to handsets 6, 7 without user intervention and at times while the handset is "on" that are under the exclusive control of the server. Provided that they have power, modern handsets are typically always "on".

Handsets 2 may be preloaded with client software for cooperating with a server coupled to the telephone service provider equipment to store and display magazine pages, or this software may be supplied to the handset by downloading from the server, or may be pushed to the handset by a said server without further user intervention at time while the handset is "on" that is under the exclusive control of the server, following a request for such software by telephone, SMS message or e-mail. The handset client application then resides on the handset and communicates with the telephone equipment provider's back-end server across the operator's network or the Internet.

Figs. 2 and 3 show typical screenshots for a handset so enabled. Fig. 2 shows a Menu page 8 including a magazines button 8a. Selecting this will display the screenshot of Fig. 3 on which several magazines 9 to which the user has previously

subscribed are selectable by the user. The user may then browse individual pages from a selected such magazine stored in memory in the handset at their will.

A single server 10 (Fig. 1) may be used to deploy magazines from multiple content providers 11 to multiple handset client technologies, here Flash handsets 6 and Java handsets 7. We shall now explain with reference to Figs. 4 to 8 how a magazine administrator may create and deploy such magazines.

Server 10 provides a private web-site where content providers can build their own magazine by uploading images of the right dimensions. Content providers can choose between different pre-set "styles" of magazine, and these styles are defined as super-templates in the system. Super-templates themselves are created and edited by the system administrator. Once built this magazine can be populated using an automatically generated web interface. The content provider 11 does not need detailed knowledge of Macromedia Flash or MIDP2 technologies, since compiled Macromedia Flash elements may be modified on the fly and deployed directly to Flash handsets 6, while the relevant pictorial elements and colour definitions are taken from the content provider's input and applied as MIDP2 definitions to Java handsets 7. A magazine administrator 12 can apply definitions to a database 13 mapping the feed 14 to automatically populate the magazine with content from a combination of technologies including XML feeds, RSS feeds and content from Web pages, as explained in more detail below. The administrator can define this mix and how to 'scrape' content from web pages in data without any code changes. A typical example is shown in Fig. 5, where four different RSS feeds are mapped onto four different magazine channels. The feed refers to URLs of web pages for stories 15 whose text must be 'screen scraped', while the picture/photo source 16 comes from another web page defining pictures in a list. 'Screen scraping' is defined by an XML format that defines how to interpret the existing XML used in RSS feeds.

Fig. 6 shows a typical feed definition for three channels from a content provider Silicon.com. The location of the files is identified at 17. The Channel Names are identified at 18. The Channels are mapped into the database 13 at 19. The RSS URLs and HTML URLs for the feed are identified at 20. Keyword mapping from the RSS feed to internal meaning is defined at 21. The date interpretation from the feed is defined at 22. The story templates to convert HTML to pictures or to text and pictures are defined at 23. The times of day to run the feed are defined at 24.

Interpretation of HTML is performed using XML templates to define how to extract content out of HTML. The content in these cases will be the story text and the pictures. The remaining information comes from the RSS feeds. However, it is possible to get story titles, authors, publish dates from the HTML as well, using these techniques. Fig. 7 shows an example of an XML template used to get story text, and Fig. 8 shows an example of getting pictures out of a story headline. The tags used to navigate HTML such as <MATCH> can be used as often as required. This is followed by a <REPEAT> tag which goes through the content following the match above it repeatedly to extract the information in the form of variables defined with <%%....%%> marks. The repeat structure ends when the <MATCH> after the repeat is reached.

The server architecture is further discussed below with reference to Figs. 25 to 28 of the accompanying drawings.

We shall now explain briefly how the portable client handsets are configured. Referring to Fig. 9, it will be seen that the configuration is broadly arranged in four stacked layers. An Event Handler Application (EHA) 25 is adapted to respond to events coming from elsewhere and to perform synchronisation, as explained in more detail below. These events may be time scheduled events, SMS events or user initiated events. A Graphics Engine 26 communicates, together with the EHA, with operating system 27 of the portable handset, which – in turn – is adapted to communicate via wireless communication with the telephone network 28. Graphics Engine 26 is implemented using the Flash player for Flash-enabled handsets and the Java graphics engine for Java-enabled handsets. Graphics Definition layer 29 comprises appropriate templates such as Flash templates on Flash-enabled handsets. The graphics data is provided at 30. Thus, it will be seen that the architecture of the client handset is designed so that rapidly changing content is the smallest element and at the top of the layered stack. The purpose of the remaining layers is to control and minimise the data download of any one changing component.

Flash Actionscripting is used to control telephone operation in Flash-enabled handsets, and the Java equivalent in Java-enabled handsets, via the local webserver. Thus, in Flash-enabled handsets with a Symbian™ operating system, the FlashLite player can access any telephone function via a Symbian infrastructure component. The scripting language can instantiate a Symbian eCOM object directly, and run it, or

calls the relevant operating system directly. The system can add further eCOM objects by installing additional DLLs via the software upgrade mechanism.

By employing rarely changing Flash templates containing graphically rich content and employing templates including the more often changing text and pictorial content via the Flash scripting language, for Flash-enabled handsets, and the corresponding Java arrangements for Java handsets, and by carrying out synchronisation of magazine pages without user intervention and at times while the handset is "on" that are under the exclusive control of the server, usually at night, we can present a graphically rich user interface for magazine content within acceptable and practical constraints for data flowing on the wireless network.

Zip type file formats are used to transfer files to the handset. The use of a zip type file format has the advantages that the files are heavily compressed minimising content charging for the user, and the server can change any file on the handset (subject to certain security constraints).

Fig. 10 is similar to Fig. 9, but with the EHA expanded to show typical components. The Event Handler 25 includes a web server 31 to allow Graphics Engine 26 to communicate with this layer. A Graphics Engine Event Handler 32 is provided to respond to events from Graphics Engine 26, which may come either from web server 31 or directly. Provision is made at 33 for start-up from the operating system 27. The application presents an icon such as that at 9 (Fig. 2), which allows the starting of the application and Graphics Engine. Even though the application will always be running, this operation causes the Graphics Engine to display (as in Fig. 3). A storage component 34 responds to write commands from Graphics Event Handler 32. An SMS Event Handler 35 responds to incoming SMS events in the operating system 27. A further component 36, here identified iCom, allows extensibility and is used by web server 31 to communicate with operating system 27. A component 37, called http Request, puts the user's identity and protocol version number on each request and sends it through to the server. Network Event Handler 38 responds to network events, which will usually be http responses to requests, and acts upon them. Download Manager 39 requests content from the server via the URL defined in the Independent Data Package (IDP) definition (explained in more detail below). This manager is adapted to request download in blocks, and any failure results in only the missing blocks being downloaded. Scheduler 40 stores and act upon tasks stored in a

task queue 41. IDP-expander 41a expands compressed content in the packages and installs the files in the right place in memory.

Persons skilled in this field, such as software applications engineers, will appreciate that many of these individual components of the client handset system are either standard items known in themselves in other applications, or may readily be adapted from other applications given the functionality explained, so that in general, for those components, no further description should be necessary.

As will become apparent from the description below, the combination of these components and the manner in which they are arranged to cooperate enables novel technical results to be achieved.

As we shall explain, the system described allows content to be 'pushed' (from the back end server coupled to or part of the telephone service provider equipment) to a plurality of individual handsets without involvement or interaction of the user of the handset. The next time the user looks at his or her handset updated magazine content is there waiting for them. The client implements the push in three different ways. Which way can be chosen on a magazine basis or user basis and the choice can be made by the user or system administrator dependent on the requirements for the magazine in question. More than one mechanism may be employed for the same magazine/user. The three mechanisms are SMS initiated synchronisation, time initiated synchronisation and network initiated synchronisation.

For SMS initiated synchronisation, the back end server will send an SMS message to the handset to tell it that data is waiting for it and it needs to do a synchronisation.

For time initiated synchronisation, in each IDP (see further explanation of this concept below), there is a 'next Sync' time package. This time is stored in the task queue 41 with the application identity (AppId) as an index into the queue. When the time is due the client will perform the synchronisation automatically.

Network initiated synchronisation has previously been attempted to push content in a manner unrelated to the present disclosure over an Internet connection, but each of the previous proposals for achieving this has severe drawbacks. The most usual approach is to keep a connection from the client to the server and then use this connection to notify the client when the push is needed. However, servers have limited numbers of connections (at most the current limit is 65,536 connections per network card but in reality most practical servers and operating systems have limits

well below this). Thus to serve potentially millions of portable handset users with magazine content would require large numbers of servers at a high cost for a connection which is rarely being used, making the exercise uneconomic. It would be better, if possible, to get the server to connect back to the client when needed. However, firewalls and the private address space used on wireless networks would prevent this. We have overcome this obstacle by using an innovative technique. The RTSP protocol is normally used to initiate a streaming video session. Thus firewalls are configured to know about this protocol and thus to allow a reverse connection from a server to the client which would not normally be possible because GPRS networks use a private address space and servers on the Internet cannot directly initiate a connection into that private address space. However, in an implementation of our system, the handset client application starts an RTSP session with the server. The back-end server responds saying this is possible and then starts streaming data. The back-end server is arranged to stream at a very low bit rate – in fact at the lowest rate possible - whilst the firewall believes the connection is still open. In this way we are able to address the client at any stage without the client needing to keep the connection. Moreover, because this is all to be carried out without user intervention and at times while the handset is "on" that are under the exclusive control of the server, multiple magazine page content can be satisfactorily transmitted even at this low bit rate.

Synchronisation techniques are quite well established in themselves and standards such as SyncML have been created for use in the telephone industry. We have found these standards, and SyncML in particular, to be deficient in two main areas: namely in getting content via different networks, and in defining priorities to get different independent data elements in different timescales and with different degrees of urgency and on different networks (where the cost elements may be significant). We have developed three new concepts, namely Independent Data Packages (IDP), Data Delivery Rules (DDR) and Data Release Time (DRT), which overcome these problems.

An independent data package (IDP) is a grouping of data, which is a consistent standalone whole. If such a package is delivered to a portable handset, it is not dependent on any other data components. An example would be an IDP containing a story or collection of stories and pictures, which may refer to a piece of video content (however, in referring to the video which is not present in this package it gives a time

for the video to appear – if a link is present it will start a video that says: "coming soon"). A separate IDP would contain the video plus the same stories but references directly to the included video. Thus these two IDPs are each a consistent whole such that they can be present on the handset at different times. An IDP also has an associated priority. The highest priority IDPs are downloaded first to the client handset application; otherwise (for the same priority packages) the order in which they are sent will be obeyed.

Each IDP has an associated Data Delivery Rule (DDR). A DDR defines how and over what time intervals and in what order various networks can be tried for the download of the synchronisation data.

Data is downloaded to the client handset application according to the DDR. The download is in the form of package of files (IDP). The extraction of the IDP and installation of the files occurs at a time defined by a Data Release Time (DRT). If the DRT is past, the files are installed immediately. The use of DRTs enables content to be released to the public using a telephone network all at the same time. An example would be releasing a pop video to 1 million people at the same instant (something that would otherwise be technically impossible without using a broadcast network such as television).

We shall now explain, with reference to Fig. 11, how these concepts may be used in practice to achieve synchronisation in magazine page content, and, in particular, how synchronisation can be configured by the server to be initiated via an SMS push from the back end server.

In a first step 42, a client handset sends the following data to server 10 coupled to the telephone service provider equipment: (a) usage statistics (as explained and for purposes further explained below), (b) its "customer id password" (this is a one-way encryption of "customer id" and the "time now" field (d)), (c) "sync anchor data" for each IDP (that has been previously sent) consisting of a "last sync time" (server time), and (d) "time now" (handset time).

In a second step 43, server 10 sends the following data to the handset: (a) "server time now" (used later by the handset to confirm success and to serve as "last sync time" when this particular synchronisation is complete), and (b) an "IDP definition" list determined by server 10 as due to the handset. An "IDP definition" consists of (1) a URL to the IDP; (2) a Data Delivery Rule (DDR) for the IDP; and (optionally) a Data Release Time (DRT). The DDR consists of a list of networks to

try and, for each such network, timing rules for trying that network. For example, the networks may be: (a) "G" for GSM which may be GPRS, UMTS, HSDPA etc, (b) "W" for WLan, and (c) "B" for "Bluetooth". A timing rule defines how long a particular network will be tried. High priority might be indicated by "R0" (meaning a relative time offset of zero minutes). Other priority examples could be "R100" (meaning anytime within the next 100 minutes), or "A2:00-A4:00" (anytime between absolute server time 2:00am and 4:00am). The rules may be combined, so that, for example, "B(R100)W(R100)G(A2:00-A4:00)" would mean try Bluetooth for 100 minutes from now; if that fails, try WLan for a further 100 minutes; and, if that also fails, try GSM between 2:00am and 4:00 am). The DRT, if present, defines a time after which the package must be expanded and its files put in place. As indicated above this may be used for publication of content with an embargo time on it (for example: a music video to be released to the public at a precise time on a particular date).

The handset then requests, in a third step 44, the data for each high priority (ie immediate delivery) IDP via the network defined by the rules at the time and order defined by the rules. Each IDP will have an AppId.

For each package a web server 10a replies with the content in a fourth step 45.

The third and fourth steps are repeated as necessary.

Finally, in a fifth step 46, the handset indicates success to server 10 for each IDP, and stores the server time supplied in second step 43 as the new "last sync time".

Subsequently the lower priority packages are requested according to the DDR rules as multiples of the third and fourth steps

If synchronisation is initiated at the wrong time [Perhaps the handset clock had been changed] or the back-end sync server is busy, it may respond with a "wait" command instead of the expected data. The "wait" command asks the client handset to reschedule the synchronisation request time for the AppId. If the back-end server does not ask for a "wait", which should be the usual situation, the IDP-definition package sends commands back to the client handset, detailing actions to take when downloading the IDP, as shown for one example in Fig. 12. In particular it contains the DDR (data delivery rules) and the size of the package.

As explained above, the IDP Package (Fig. 13) is the compressed single independent data file containing the files to be stored. If the content contains forward locked DRM (Digital Rights Management) protected content, then the .DD and .DM

files are both included in the package. When the package is expanded the files are forward locked to the handset. Also the package contains the DRT (Data Release Time) for the package to be expanded. If this is zero then it must be done immediately. The package also contains the Next Sync time in DDR format for the AppId.

Also as explained above, the Data Download Rules (Fig. 14) specify how and when to download the content. The Scheduler in the client handset processes these rules as a set of tasks. If one fails within the specified time-out the next rule is used in the sequence. In Fig. 14, "R" represents relative time; "A" represents absolute time; "D" is the random number delta time range applied to ensure that handsets do not connect to the server at exactly the same time to perform a synchronisation. This approach coupled with the "wait" command of Fig. 12 allows load balancing of the server.

Commands from the handset to the server are of the forms shown in Figs. 15 and 16. It will be noted that usage data is supplied by the handset to the server as part of package#1 (Fig. 15), this usage data taking the format shown in Fig. 17, and explained in more detail below.

The pages pushed to the handset may include interstitial advertising as well as magazine pages. These interstitial advertising pages may entice a User to press a key taking them to more details about a product or an offer which itself contains calls to action for revenue generation. Examples of calls to action are making telephone calls (for example: IVR), sending SMS messages (for example for an SMS initiated purchase), sending an MMS or making a data connection to an Internet site containing further information. The actions concerned are performed automatically by the handset when the key is pressed. Other examples of calls to action include purchase of content, competitions, voting, surveys etc. and may include payments which can be taken from a credit or debit card via an SMS message, or automatically by debiting the User's pay-per-call phonecard within the handset. An example of a call to action is shown in Fig. 18. In this case, pressing the key 47 will initiate a telephone call to a particular destination.

Advertising interstitials can be delivered to the handset with magazine editions or at other times. They may contain promotional material which is rich in multimedia content (such as videos, music etc). To minimize or eliminate cost to the User, they

are delivered via zero rates URLs or using overnight delivery in cooperation with the User's telephone service provider.

Advertising pages will usually be linked to a specific magazine page by a table of associations, so that when the user chooses to display a particular magazine page, any advertising page linked to it will be displayed, usually over the magazine page.

Subject to acceptance by a User of terms and conditions agreeing to this, user activity within magazine and advertising pages is collected in terms of which stories have been read, which adverts have been read, any calls to action (including type) and any other applications initiated from the magazines. These activities are monitored on the handset, and therefore at no cost to the user and are then transmitted to the server as part of the synchronisation procedure, again at no cost to the User, unless there is a subscription charge for a particular magazine, in which case there is no additional cost beyond the subscription. The length of voice calls made as a result of calls to action may be monitored, and premium SMS or premium rate phone call initiation can be confirmed with providers of such services. The number of views (or even length of views) of rich content such as videos may be monitored, and a charging model may be provided. As a result, content providers can obtain a measure of the success of their promotion or sales activity and revenue loss if they have provided music at no cost for example and it is listened to many times. Data is collected at the user identity level (although safeguards avoiding identifying individuals can be included). By collecting and building profiles for different types of user (based on the magazines they read and personal data they agree to provide) the effect of a particular promotion on these categories of user can be determined. Once profiles of users have been created, targeted advertising for each user can be based upon experience of that profile group to similar advertising in the past. Targeted advertising can also be based upon activity of a majority of users placed in a group, in effect employing "minority targeting based on majority acceptance". Thus, if particular advertising is very successful to one profile group in generating revenue, the advertising may be repeated to other members of the group who did not previously make calls to action as a result of the advertising, and may have missed it. The collected data also allows external recommendations to be made based on content provided. Content in the form of stories and articles can be called up from an external recommendation engine which will provide downloadable content for each user group based on the content of a story. Thus, a story about Britney Spears may offer music to young people but a promotion of a book on

pregnancy to a housewife. Recommendations may take account of private Customer Relationship Material (CRM) data, margin and volume analysis of different "calls to action" that are available, information on the popularity of different content items, and other information such as promotions or sponsorship. Thus the advertising pages, the magazine pages with which individual advertising pages are linked, and even the content may be varied automatically for individual Users.

The client handset will maintain a list of magazines to which the User has subscribed, and a list of all available magazines. From the menu screen of Fig. 2, the User will reach a list of presently subscribed magazines (Fig. 19). Clicking to "Find New Magazines" at 48 will bring up a new screen (Fig. 20) with non-subscribed magazines. Selecting a particular one 49 of these, will bring up a teaser 50 (Fig. 21), which may itself be a short magazine, but will usually consist of only a single page with a subscribe button 51. Clicking button 51 will add the specific new magazine to the subscribed list of Fig. 19, and a synchronisation is performed in which this magazine and its templates form the highest priority IDP. When this IDP arrives, the User is alerted about the new magazine being available. The User is then presented with a subscribe screen which on clicking gives the User immediate access to the magazine. In some instances this subscription step may form a payment authorisation, sent by SMS. The steps for adding, as shown in Fig. 22, are generally similar to those of Fig. 11 for synchronisation.

A User may decide to unsubscribe from a particular magazine (Fig. 23), which involves leaving it in place but requesting no further updates. For this the server is informed not to update this magazine when a synchronisation is next performed or not to send an SMS alert if that alerting technique is selected. Additionally the IDPdef returning will instruct the client handset to remove the schedule sync for the AppId concerned. Thereafter the User may still view stored pages of the unsubscribed magazine but will receive no further updates.

A magazine may also be removed from a client handset, following the steps shown in Fig. 24.

When a new magazine is created it is deployed to appear in the available magazines list of Fig. 20. The content of a newly deployed magazine is usually just a base package consisting of just four files in the form of a teaser. The magazine itself will not be deployed to client handsets until the next time the magazine appears.

Provision is also made for Alerts. An Alert would be an item of breaking news, usually associated with news magazines. Such Alerts may arise at any time. The alert is provided to subscribers by SMS push. Information may also be displayed to a User the next time the User views a particular magazine or any magazine. Such Info-Alerts provide a way of informing the User about service changes, specific magazine deployments etc. If the AppId for the Info-Alert is 0, it then replaces the Magazines list (but, once dismissed, it never appears again). If the AppId is for a specific magazine, it replaces the first screen of that magazine (but, again, once dismissed, it never appears again).

Portable handsets may be used abroad (roaming abroad) which gives rise to substantially higher telephone charges while the handset is roaming. To prevent a User receiving such unwelcome charges for magazines, the User may be prompted to confirm that they still wish to connect to receive magazines before any such connection is made for synchronisation, adding, unsubscribing or removal when roaming abroad.

Because synchronisation is fully controlled by the server, there is a possibility that the User might delete some of the files from the portable handset without the server being aware that they are missing. To get back missing files, a User may reset a magazine, which sets the last sync time to 0 and results in the system sending all templates and the latest edition for that magazine; a User may reset the magazine list, which results in setting last sync time to 0 for AppId=0 and results in the base package for all magazines being sent with the magazines.txt and available.txt files; or a User may reset all magazines, which results in setting last sync time for all AppIds to 0, so that all templates and editions are sent. As will be appreciated, this last option could be expensive in data and the User is warned.

Provision is preferably made for alternatives to telephone connection, where available, for large data files. To achieve this, the client handset is provided with the capability to search for installed Bluetooth proxies running on any PC in its neighbourhood. When it finds such a configured PC it automatically downloads the required content using this Bluetooth connection. The priority rules are configured to make this "free-of-charge" data transfer higher priority for large data file such as videos.

Preferred overall architecture for server 10 is shown in Figs 25 to 28. Referring first to Fig. 25, it will be seen that the architecture comprises six main components:

- Magazine Builder 52 allows the creation of simple magazines quickly;
- Content Management System (CMS) 53 creates the interface for entry of content and templates;
- Sync Server 54 controls what content is delivered to handsets 2;
- Publication Server 55 creates the content package for each handset when necessary;
- Delivery Servers 56 comprise scalable web servers used to deliver files to the handsets 2; and
- Reporting System 57, which, in preferred arrangements, operates over night and separately from the other components on separate systems.

Reference should also be made to the discussion of creation and deployment of magazines given above with reference to Figs. 4 to 8.

Magazine builder 52, best shown in Fig. 26, is enabled to select a super-template from a super-template database 58 to build a magazine. A super-template is a set of Flash templates which define the format and layout of a particular magazine. On top of this data is added meta-data that includes: the titles of channels; colours defined separately for all screens [The colours of all elements can be defined]; images used for headings, icons, teasers and banners [These can be defined in several screen sizes to ensure scaling is not required and that visual quality is maintained]. This approach allows the options of defining a magazine in terms of inclusion of thumbnail images only, inclusion of thumbnail images for story overview with bigger story pictures in the stories themselves, and inclusion of a weather map channel. Additionally, the magazine publisher can define the feed URLs and the way these are to be interpreted by this interface. Manual content entries 59, 60 and 61 are shown in Fig. 26 for respectively configuring RSS feeds, adding a super-template and configuring a super-template.

When the template is completed, it is deployed at 62 to CMS 53, best shown in Fig. 27. This server is the main content sourcing system, and is provided with automatic feed inputs such as input 63 for RSS feeds 64 and input 65 for XML feeds 66, but may also accept entry of manual content 67 at manual input 68. A magazine

built through the magazine builder 52 and deployed at 62 automatically gets an interface at 69, and is received into a Magazine Template Store 70. The feeds received through inputs 63, 65 and 68 are received into a Content Store 71. Provision is also made for manual input at 72 of individual templates. The content stored in Content Store 71 interacts with Graphics Re-sizer 73 to ensure that the size of graphics content is appropriate. CMS server is interactively linked to a Content Management System Database 74.

Content from CMS 53 is deployed to live at 75 to the Sync Server 54, best shown in Fig. 28, and published at 76 to the Publication Server 55.

The Sync Server 54 receives content at 77 from CMS 53 and performs a synchronisation of content with handsets 2. As explained previously, content may be pushed to an individual handset using an SMS sent from the server via SMS control 78 or pseudo-pushed using synchronisation times. The handset may effectively be told when next to synchronise with Synchronisation System 79 of the server 54 whenever it connects with the server. Sync Server 54 co-ordinates registration of users through a Registration System 80, and subscription of users to individual magazines via a Subscription Service 81, all as discussed above, and is coupled to a Subscription Database 82 for this purpose. Sync Server 54 also includes provision for customer service functions 83 through a Customer Relationship Management (CRM) system 84, which allows manual entry 85, and for system administration 86 through a System Admin System 87.

Publication Server 55 (Fig. 25) ensures that content is published to handsets 2 at the right time. Its primary task is to retrieve the correct content at 76 from CMS 53, and then compress and package it up, preferably into Independent Delivery Packages (IDPs), as discussed above, and in accordance with publication rules contained in a Publications Rules Database 88, and to deliver it to Delivery Servers 56. These servers provide horizontally scalable server download capability for the IDPs and transmit data to handsets 2.

Persons skilled in this field, such as systems and software applications engineers, will appreciate that, in general, these individual server components are either standard items known in themselves in other applications, or may readily be adapted from other applications given the functionality explained, so that, for those components, no further description should be necessary.

Claims

1. A telephone communication system comprising: telephone service provider equipment, a plurality of portable telephone handsets each adapted for user controlled connection to the telephone service provider equipment via a wireless connection for telephone communication between the handset and remote telephone equipment via one or more telephone networks, and a server coupled to the telephone service provider equipment and provided with memory storing a plurality of magazines; the server being adapted to transmit stored magazines from said memory to portable handsets of said plurality without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset of the plurality being adapted for user selection of (subscription to) one or more of said plurality of magazines and being adapted to receive and store said selected magazine(s) in a portion of the memory of the said handset for subsequent selective viewing of pages thereof on the handset screen by the handset user at a time of their choosing; and each said handset being adapted to selectively store and overwrite in memory only those changes made in each page of the said magazines as compared with the same page of a selected said magazine previously received by the said handset following an initial reception of the said page.

2. A telephone communication system according to Claim 1, wherein each said magazine comprises at least one page of text and/or graphics generated by a publisher of the said magazine for transmittal to users, and wherein provision is made at the server for updating at least one page of a magazine at the server at a selected time.

3. A telephone communication system according to Claim 1, wherein interstitial advertising is stored in an advertising portion of the memory of the server, and the server is adapted to transmit the said advertising to portable telephone handsets without user intervention and at times while the handset is "on" that are under the exclusive control of the server, each said page of interstitial advertising being linked to a particular page of a particular magazine by a table of associations stored in the server, and each portable telephone handset being adapted to store the said interstitial advertising in a portion of the handset memory and to display a specific page of

interstitial advertising when the user selects the particular said magazine page with which it is linked for view.

4. A telephone communication system according to Claim 1, wherein portable telephone handsets of said plurality are adapted to store in the memory of the handset an historical record of particular pages displayed on that handset.

5. A telephone communication system according to Claim 1, wherein provision is made for calls-to-action within a said page by providing a link on that page to a communication capability of portable handsets selected from telephone communication, SMS messaging, e-mail and initiation of an on-line Internet session; and each said handset being adapted so that user selection of a particular said link automatically initiates a telephone call, SMS message or e-mail to a destination defined by the link or initiation of an on-line Internet session with a destination defined by the link.

6. A telephone communication system comprising: telephone service provider equipment, a plurality of portable telephone handsets each adapted for user controlled connection to the telephone service provider equipment via a wireless connection for telephone communication between the handset and remote telephone equipment via one or more telephone networks, and a server coupled to the telephone service provider equipment and being provided with first memory storing a plurality of magazine pages; the server being adapted to transmit stored magazine pages from said first memory to portable handsets of said plurality without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset of the plurality being adapted to receive and store at least selected said pages in a portion of the memory of the said handset for subsequent selective viewing of said pages on the handset screen by the handset user at a time of their choosing; each said handset being adapted to selectively store and overwrite in memory only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page; the server being provided with second memory storing one or more pages of interstitial advertising, the or each such page being provided with a link to a specific magazine page by a table of associations; the server being adapted to transmit the one

or more said pages of interstitial advertising to portable telephone handsets without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset being adapted to store the said interstitial advertising in a portion of the handset memory and to display the or a specific page of the interstitial advertising when the user selects the particular said magazine page with which it is linked for view.

7. A telephone communication system according to Claim 6, wherein portable telephone handsets of said plurality are adapted to store in the memory of the handset an historical record of particular pages displayed on that handset.

8. A telephone communication system according to Claim 7, wherein said historical record further includes the time for which a particular page of magazine or advertising was displayed.

9. A telephone communication system according to Claim 7, wherein the table of associations linking pages of interstitial advertising to particular magazine pages for a specific handset is stored in the memory of the handset; and wherein the table of associations for a specific handset is arranged to be automatically varied in accordance with said historical record.

10. A telephone communication system comprising: telephone service provider equipment, a plurality of portable telephone handsets each adapted for user controlled connection to the telephone service provider equipment via a wireless connection for telephone communication between the handset and remote telephone equipment via one or more telephone networks, and a server coupled to the telephone service provider equipment and being provided with a memory storing a plurality of pages selected from magazine pages and advertising pages; the server being adapted to transmit stored pages from said memory to portable handsets of said plurality without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset of the plurality being adapted to receive and store at least selected said pages in a portion of the memory of the said handset for subsequent viewing of said pages on the handset screen by the handset user; each said handset being adapted to selectively store and overwrite in memory

only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page; and each said portable telephone handset storing a record in memory of pages displayed on its handset screen, and being adapted to transmit said record to the server independently of use of the handset for telephone communication.

11. A telephone communication system according to Claim 10, wherein said historical record further includes the time for which a particular page was displayed.

12. A telephone communication system according to Claim 10, wherein each handset is adapted to transmit its record when prompted to do so by the server.

13. A telephone communication system according to Claim 10, wherein the record is automatically erased from the handset memory following such transmittal.

14. A telephone communication system comprising telephone service provider equipment, a plurality of portable telephone handsets each adapted for user controlled connection to the telephone service provider equipment via a wireless connection for telephone communication between the handset and remote telephone equipment via one or more telephone networks, and a server coupled to the telephone service provider equipment and being provided with a memory storing a plurality of pages selected from magazine pages and advertising pages; the server being adapted to transmit stored pages from said memory to portable handsets of said plurality without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset of the plurality being adapted to receive and store at least selected said pages in a portion of the memory of the said handset for subsequent viewing of said pages on the handset screen by the handset user; each said handset being adapted to selectively store and overwrite in memory only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page; at least one of the said pages defining a link to a communication capability of portable handsets selected from telephone communication, SMS messaging, e-mail and initiation of an on-line Internet session; and each said handset being adapted so that user selection of a particular said link automatically initiates a telephone call, SMS

message or e-mail to a destination defined by the link or initiation of an on-line Internet session with a destination defined by the link.

15. A telephone communication system according to Claim 1, wherein a magazine is defined as a super-template defining its format and layout, on top of which meta-data identifying more rapidly changing content is added, allowing a page to be updated by transmitting only changed data.

16. A telephone communication system according to Claim 15, wherein the server includes a magazine builder adapted to create super-templates and a content management system adapted to create live magazine pages by combining a super-template from content provided to the content management system from one or more feeds.

17. A telephone communication system according to Claim 15, wherein data relating to a page is transmitted to a handset of said plurality in the form of independent data packages, each having an associated priority identifying for a collection of such independent data packages the order in which they are to be downloaded, and an associated data delivery rule defining how and over what time intervals and in what order one or more networks can be tried for the download of the data to synchronise or update a page, and optionally, a data release time controlling the time at which data is extracted from the independent data packages and the files installed into memory in the handset.

18. Providing magazine content to portable telephone handset users by a method comprising the steps of: providing a plurality of magazines to a server coupled to telephone service provider equipment, each magazine comprising a plurality of pages, and transmitting each said magazine from said plurality of magazines from the server to portable handsets of users that have previously selected (subscribed to) that magazine, transmittal taking place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, each portable telephone handset being adapted to receive and store received magazine(s) in memory for subsequent selective viewing of pages thereof on the handset screen by the handset user at a time of their choosing, only those changes

made in each page of a said magazine as compared with the same page previously received by the said handset following an initial reception of the said page being stored and overwritten in the handset memory.

19. A method according to Claim 18, wherein each said magazine comprises at least one page of text and/or graphics generated by a publisher of the said magazine and stored in said server, and pages of a magazine stored in the server are updated at times selected by the publisher.

20. A method according to Claims 17, wherein one or more pages of interstitial advertising are linked to pages of a magazine by a table of association; and wherein said advertising pages are transmitted from the server to handsets over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, each portable telephone handset storing the said interstitial advertising in a portion of the handset memory and displaying a specific page of interstitial advertising when the user selects the particular said magazine page with which it is linked for view.

21. A method according to Claim 17, wherein said portable telephone handsets store in memory an historical record of particular pages displayed on that handset.

22. A method according to Claims 17, wherein provision is made for calls-to-action within a said page by providing a link on that page to a communication capability of portable handsets selected from telephone communication, SMS messaging, e-mail and initiation of an on-line Internet session, so that the user may automatically initiate a telephone call, SMS message or e-mail to a destination defined by the link or an on-line Internet session with a destination defined by the link.

23. Providing magazine and advertising content to portable telephone handset users by a method comprising the steps of: providing a plurality of magazine pages to a server coupled to telephone service provider equipment, and transmitting said magazine pages to portable handsets, transmittal taking place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, portable telephone handsets

receiving and storing magazine pages in memory for subsequent selective viewing thereof on the handset screen by the handset user at a time of their choosing, only those changes made in each page of a said magazine as compared with the same page previously received by the said handset following an initial reception of the said page being stored and overwritten in the handset memory; providing one or more pages of interstitial advertising to the server, each advertising page being linked to a specific magazine page by a table of associations; transmitting the or each such advertising page and said table of associations to said portable handsets, transmittal taking place over said one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server; each portable telephone handset storing the advertising pages and table of associations, and displaying the/any advertising page linked to a specific magazine page when a user selects that magazine page for view.

24. A method according to Claim 23, wherein said portable telephone handsets store in memory an historical record of particular pages displayed on that handset.

25. A method according to Claim 24, wherein said historical record further includes the time for which a particular page of magazine or advertising was displayed.

26. A method according to Claim 25, wherein the table of associations is automatically varied in accordance with said historical record.

27. Providing content to portable telephone handset users by a method comprising the steps of: providing a plurality of pages selected from magazine pages and advertising pages to a server coupled to telephone service provider equipment, and transmitting said pages to portable handsets, transmittal taking place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, portable telephone handsets receiving and storing said pages in memory for subsequent viewing thereof on the handset screen by the handset user, only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page being stored and overwritten in the handset memory;

each said handset storing an historical record in memory of pages displayed on its handset screen, and being adapted to transmit said record to the server independently of use of the handset for telephone communication.

28. A method according to Claim 27, wherein said historical record further includes the time for which a particular page was displayed.

29. A method according to Claim 27, wherein each handset transmits its record when prompted to do so by the server.

30. A method according to Claim 27, further comprising automatically erasing the record from the handset memory following such transmittal.

31. Providing content to portable telephone handset users by a method comprising the steps of: providing a plurality of pages selected from magazine pages and advertising pages to a server coupled to telephone service provider equipment, and transmitting said pages to portable handsets, transmittal taking place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, portable telephone handsets receiving and storing said pages in memory for subsequent viewing thereof on the handset screen by the handset user, only those changes made in each page as compared with the same page previously received by the said handset following an initial reception of the said page being stored and overwritten in the handset memory; providing at least one of the said pages with a link to a communication capability of portable handsets selected from telephone communication, SMS messaging, e-mail and initiation of an on-line Internet session, so that the user may automatically initiate a telephone call, SMS message or e-mail to a destination defined by the link or an on-line Internet session with a destination defined by the link.

32. A method according to any of Claim 18, further including the steps of creating a magazine by selecting a super-template defining its format and layout, and adding meta-data identifying more rapidly changing content, allowing a page to be updated by transmitting only changed data.

33. A method according to Claim 18, wherein data relating to a page is transmitted to a handset in the form of independent data packages, each having an associated priority identifying for a collection of such independent data packages the order in which they are to be downloaded, and an associated data delivery rule defining how and over what time intervals and in what order one or more networks can be tried for the download of the data to synchronise or update a page, and optionally, a data release time controlling the time at which data is extracted from the independent data packages and the files installed into memory in the handset.

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received by the International Bureau on 28 November 2006 (28.11.06)

made in each page of a said magazine as compared with the same page previously received by the said handset following an initial reception of the said page being stored and overwritten in the handset memory.

19. A method according to Claim 18, wherein each said magazine comprises at least one page of text and/or graphics generated by a publisher of the said magazine and stored in said server, and pages of a magazine stored in the server are updated at times selected by the publisher.

20. A method according to Claims 18, wherein one or more pages of interstitial advertising are linked to pages of a magazine by a table of association; and wherein said advertising pages are transmitted from the server to handsets over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, each portable telephone handset storing the said interstitial advertising in a portion of the handset memory and displaying a specific page of interstitial advertising when the user selects the particular said magazine page with which it is linked for view.

21. A method according to Claim 18, wherein said portable telephone handsets store in memory an historical record of particular pages displayed on that handset.

22. A method according to Claims 18, wherein provision is made for calls-to-action within a said page by providing a link on that page to a communication capability of portable handsets selected from telephone communication, SMS messaging, e-mail and initiation of an on-line Internet session, so that the user may automatically initiate a telephone call, SMS message or e-mail to a destination defined by the link or an on-line Internet session with a destination defined by the link.

23. Providing magazine and advertising content to portable telephone handset users by a method comprising the steps of: providing a plurality of magazine pages to a server coupled to telephone service provider equipment, and transmitting said magazine pages to portable handsets, transmittal taking place over one or more telephone networks without user intervention and at times while the handset is "on" that are under the exclusive control of the server, portable telephone handsets

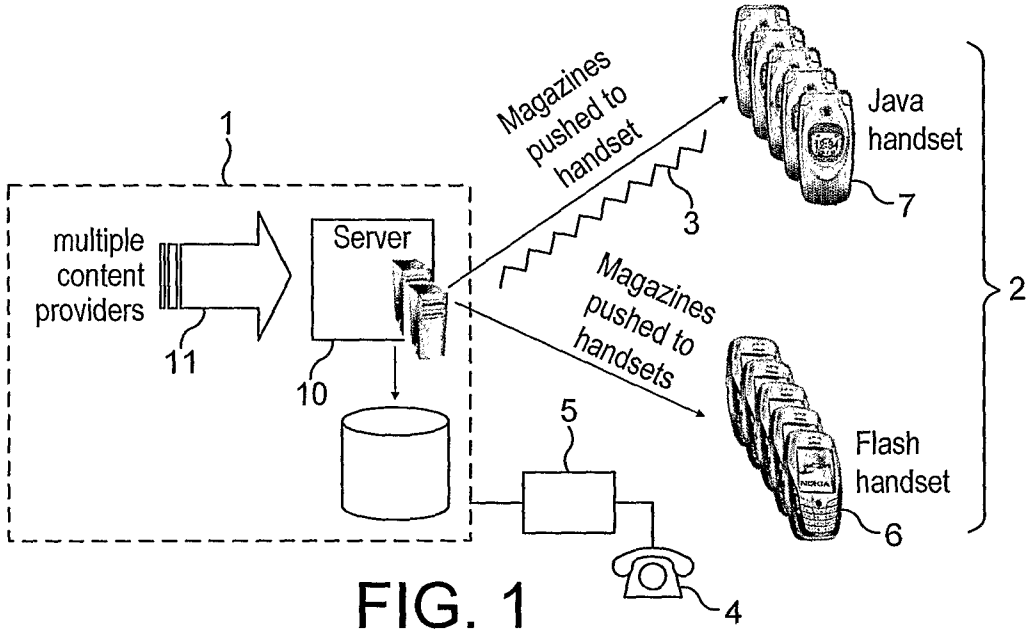


FIG. 1

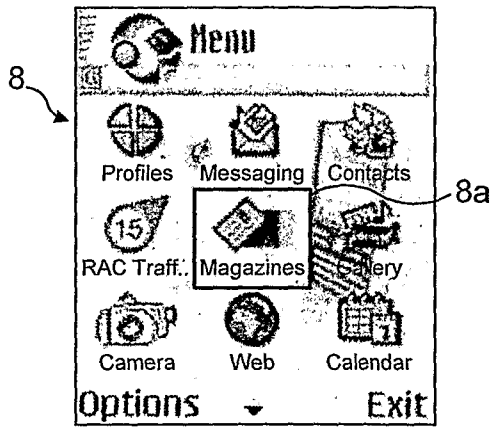


FIG. 2

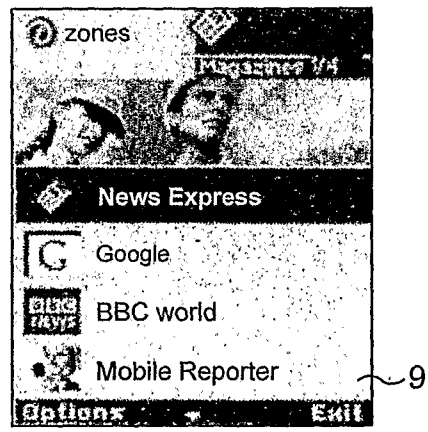


FIG. 3

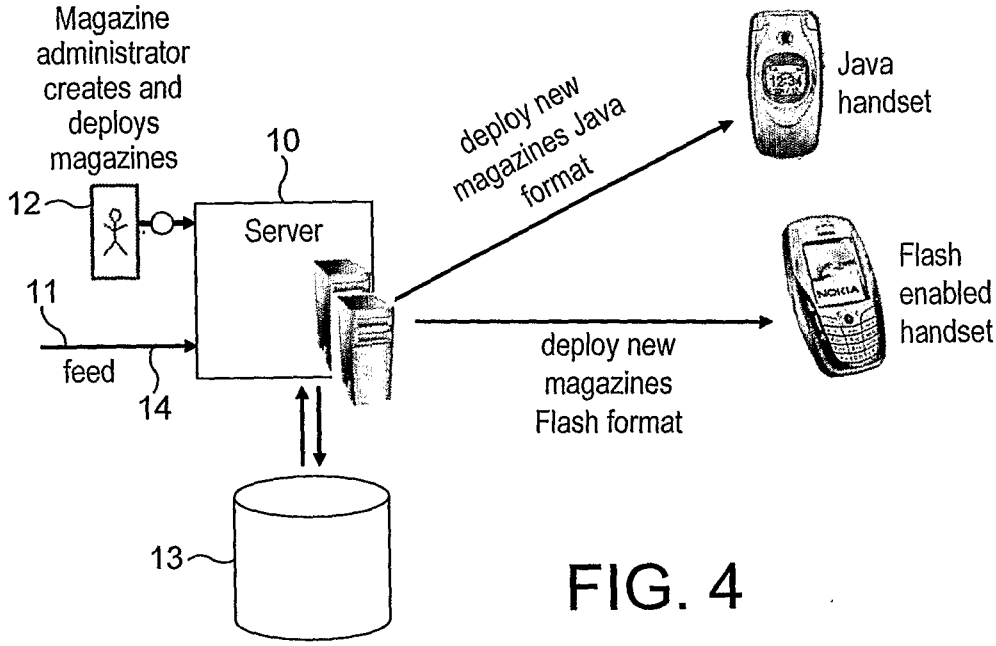

Magazine administrator creates and deploys magazines
12
10
Server
11
feed
14
13
deploy new magazines Java format
Java handset
deploy new magazines Flash format
Flash enabled handset

FIG. 4

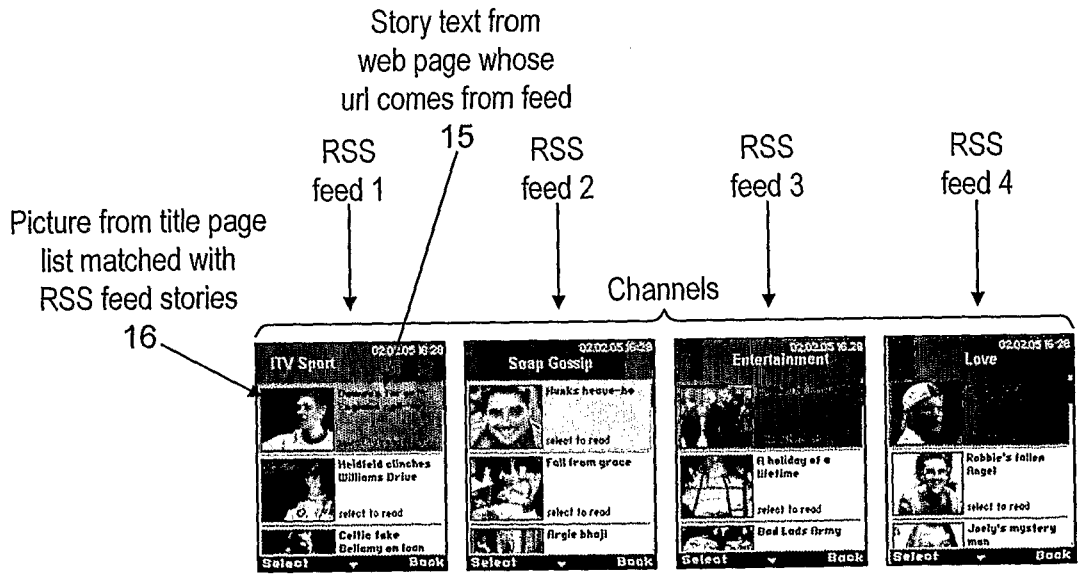

Story text from web page whose url comes from feed
15
RSS feed 1
RSS feed 2
RSS feed 3
RSS feed 4
Channels
Picture from title page list matched with RSS feed stories
16
ITV Sport
Soap Gossip
Entertainment
Love
Select
Back

FIG. 5

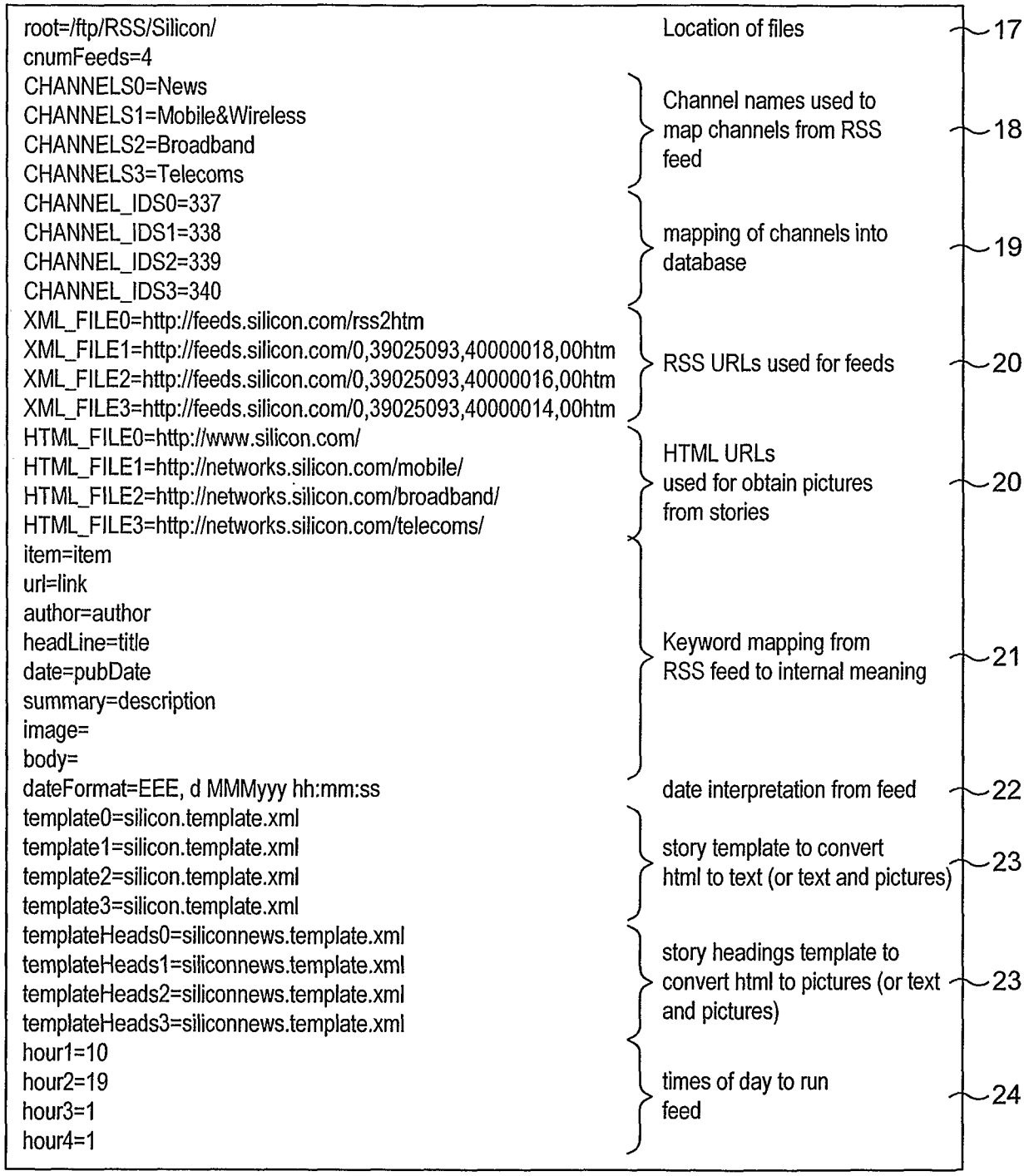

root=/ftp/RSS/Silicon/
cnumFeeds=4
CHANNELS0=News
CHANNELS1=Mobile&Wireless
CHANNELS2=Broadband
CHANNELS3=Telecoms
CHANNEL_IDS0=337
CHANNEL_IDS1=338
CHANNEL_IDS2=339
CHANNEL_IDS3=340
XML_FILE0=http://feeds.silicon.com/rss2htm
XML_FILE1=http://feeds.silicon.com/0,39025093,40000018,00htm
XML_FILE2=http://feeds.silicon.com/0,39025093,40000016,00htm
XML_FILE3=http://feeds.silicon.com/0,39025093,40000014,00htm
HTML_FILE0=http://www.silicon.com/
HTML_FILE1=http://networks.silicon.com/mobile/
HTML_FILE2=http://networks.silicon.com/broadband/
HTML_FILE3=http://networks.silicon.com/telecoms/
item=item
url=link
author=author
headLine=title
date=pubDate
summary=description
image=
body=
dateFormat=EEE, d MMMyyy hh:mm:ss
template0=silicon.template.xml
template1=silicon.template.xml
template2=silicon.template.xml
template3=silicon.template.xml
templateHeads0=siliconnews.template.xml
templateHeads1=siliconnews.template.xml
templateHeads2=siliconnews.template.xml
templateHeads3=siliconnews.template.xml
hour1=10
hour2=19
hour3=1
hour4=1
Location of files
17
Channel names used to map channels from RSS feed
18
mapping of channels into database
19
RSS URLs used for feeds
20
HTML URLs used for obtain pictures from stories
20
Keyword mapping from RSS feed to internal meaning
21
date interpretation from feed
22
story template to convert html to text (or text and pictures)
23
story headings template to convert html to pictures (or text and pictures)
23
times of day to run feed
24

FIG. 6

```
<?xtml version="1.0" encoding="ISO-8859-1"?>
<!–Template for silicon story text-->
<TEMPLATE>
<MATCH>Main Story BEGIN
</MATCH>
<REPEAT><P CLASS="storyText">{%%<STORY>%%}</P>
<REPEAT>
<MATCH>Story Body END
</MATCH>
</TEMPLATE>
```

FIG. 7

```
<?xtml version="1.0" encoding="ISO-8859-1"?>
<!–Template for echo-->
<TEMPLATE>
<MATCH>Hedline Story BEGIN
</MATCH>
<MATCH><A HREF=
</MATCH>
<REPEAT><IMG SRC="{%%<CONTENT_URI>%%}"ALT="{%%<TITLE>%%}"
WIDTH<STAR/></TABLE>
<REPEAT>
<MATCH>Headline Story END
</MATCH>
</TEMPLATE>
```

FIG. 8

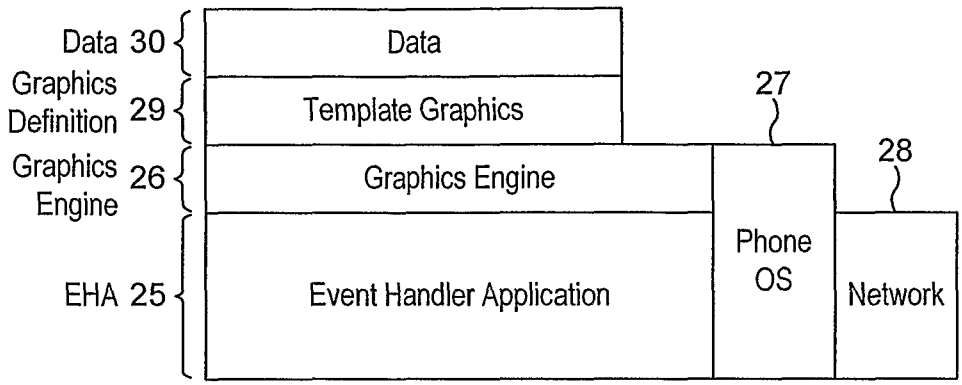

Data 30
Graphics Definition 29
Graphics Engine 26
EHA 25
Data
Template Graphics
Graphics Engine
Event Handler Application
27
Phone OS
28
Network

FIG. 9

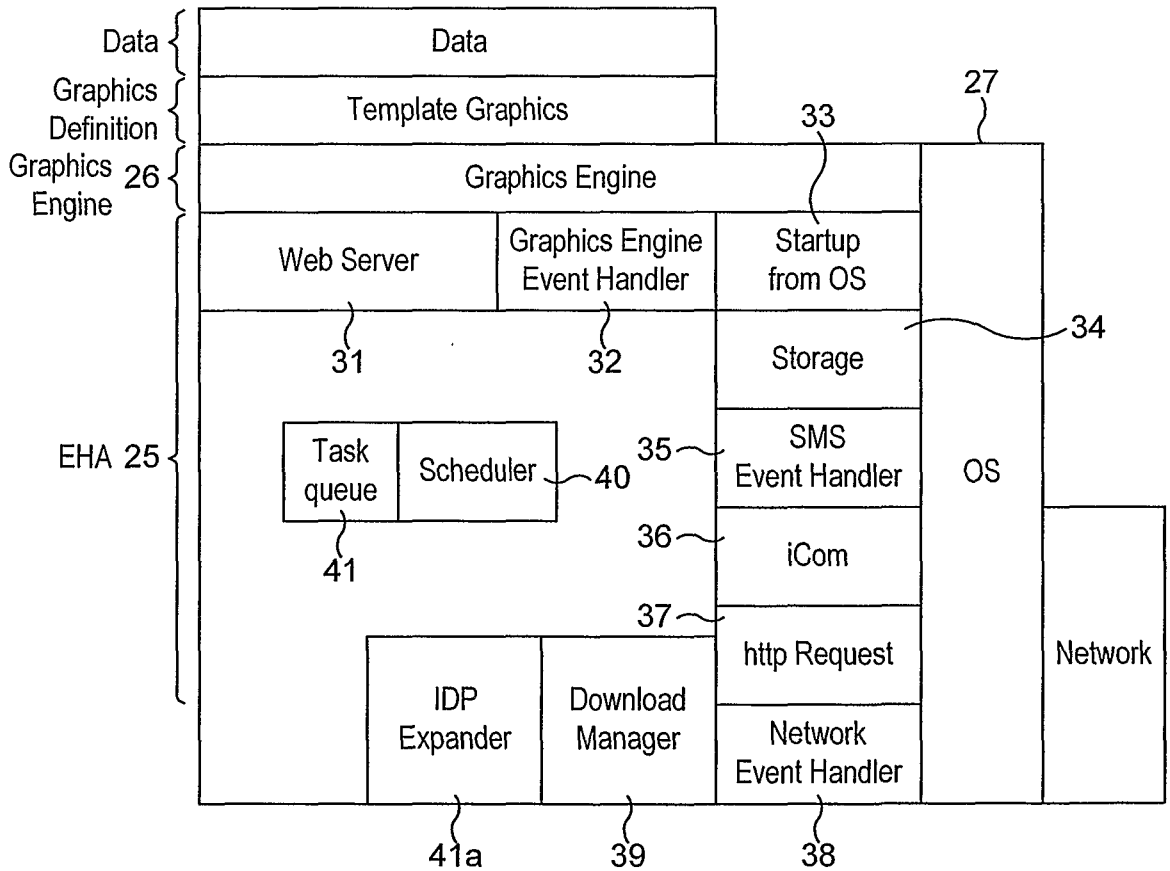

Data
Graphics Definition
Graphics Engine 26
EHA 25
Data
Template Graphics
Graphics Engine
Web Server
Graphics Engine Event Handler
Startup from OS
31
32
33
27
34
Storage
Task queue
Scheduler
40
41
35
SMS Event Handler
36
iCom
37
http Request
IDP Expander
Download Manager
Network Event Handler
41a
39
38
OS
Network

FIG. 10

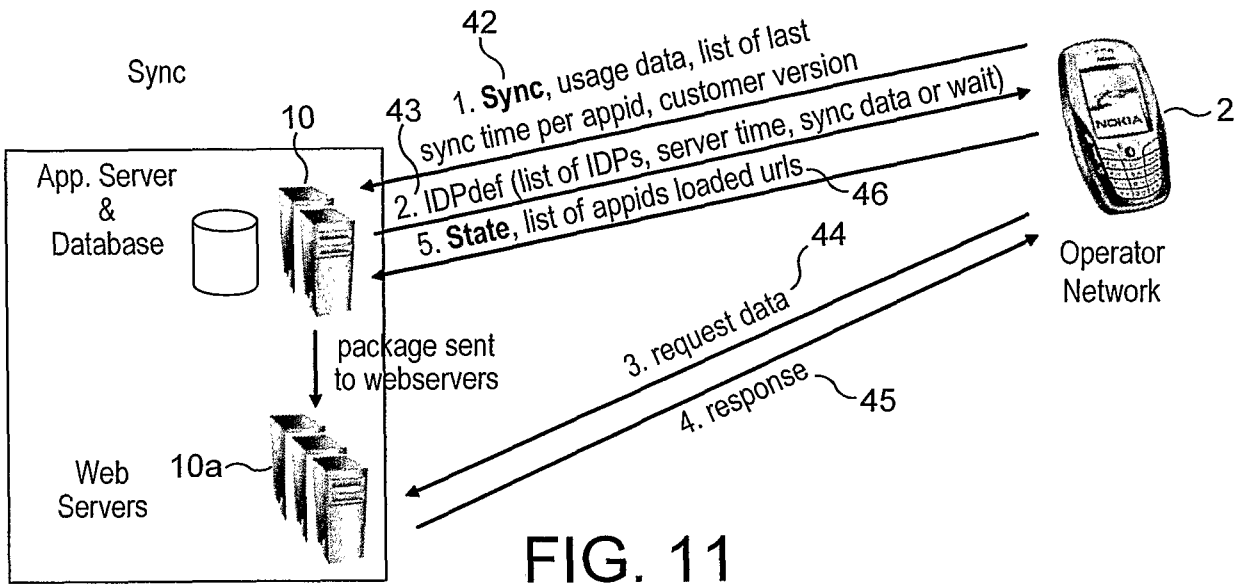


FIG. 11

IDP definition (package #2)
{ [wait {Rnnn|Ahh:mm}, Server time, Next Sync time] |
•CustomerId
•List of (IDP details)
  •Command(add | remove | unsubscribe | deploy | register)
  •AppId
  •DDR
  •username:password
  •[size] (used with add)
  •Package type { edition | alert | info alert | template | software upgrade }
  •Alert type { show | no show | userpref }
•Server time
•Next Sync time
}

FIG. 12

IDP (package #4) - compressed
- appid
- List of
  - Filename
  - Length
  - FileData
- DRT

- Package type { edition | alert | info alert | templates | software upgrade }
- Alert type { show | noshow | userpref }
- Server time
- Next sync time in DDR format
- [magazines.txt,available.txt] (not always needed eg if child AppId contained in the actual files list)

FIG. 13

DDR
- List of
  {
  - G | W | B (GSM or WLAN or Bluetooth)
  - { R nnnn Dnnnn | (relative time now + nnnn minutes Delta=mmm mins)
  - A hh:mm - Ahh:mm Dmmm (absolute time range (server time))

  }

FIG. 14

Generic command (package #1, #5)
{ sync | add | subscribe | unsubscribe | remove | state }
[usage data] (only with #1)
•customerId
•versions of protocol
•List of (sync status)
  •AppId
  •Time of last successful sync
  •Action
  •State (S (success), W (wait for DRT), F (fail))
}

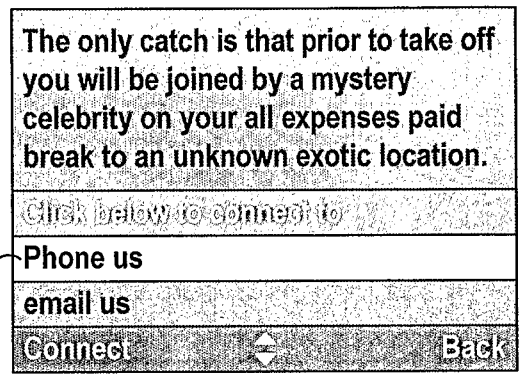
FIG. 15

Generic command (package #6)
•register
•temp customerId
•version of protocol
•List of (reg command) {
  •AppId (to register)
  •[nobase]
  •[mmc]
}

FIG. 16

Usage Stats (part of package #1)
•period start time
•period end time
•List of items {
  •Channel id/AdvertId/StoryId
  •number of views
  •calls to action SMS count
  •calls to action web count
  }

FIG. 17



Call to action from within a story, In this example Phone us starts a Phone call directly

FIG. 18

FIG. 19

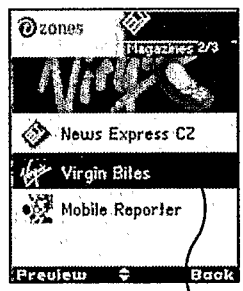


FIG. 20

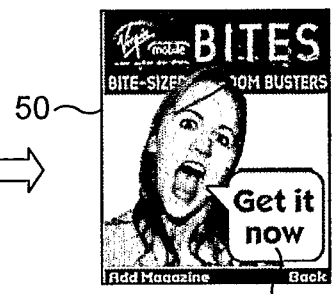


FIG. 21

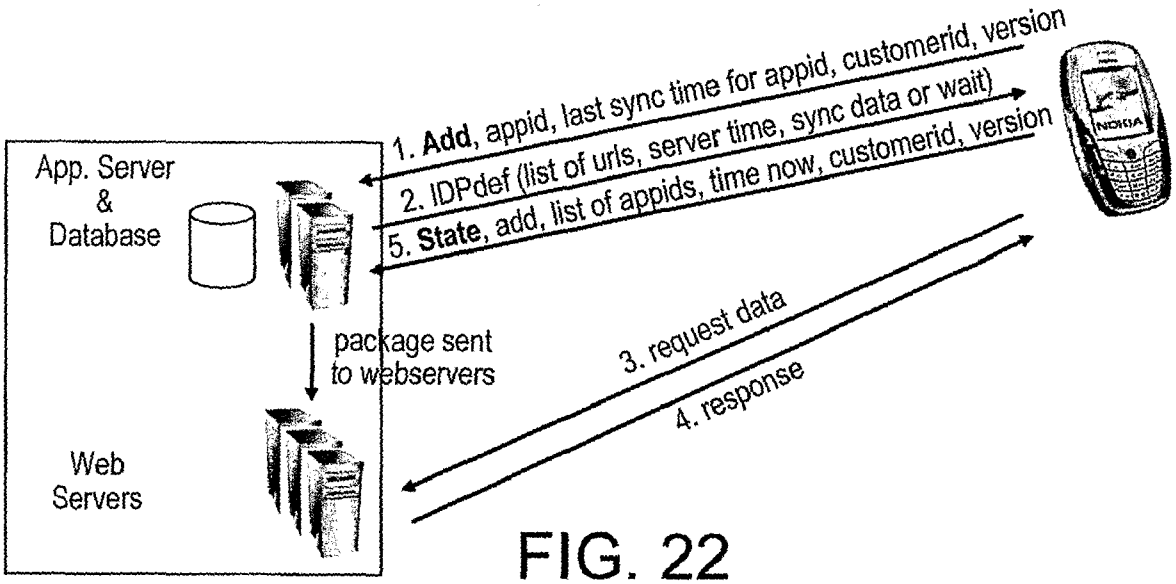

App. Server
&
Database
1. Add, appid, last sync time for appid, customerid, version
2. IDPdef (list of urls, server time, sync data or wait)
5. State, add, list of appids, time now, customerid, version
package sent
to webservers
3. request data
4. response
Web
Servers

FIG. 22

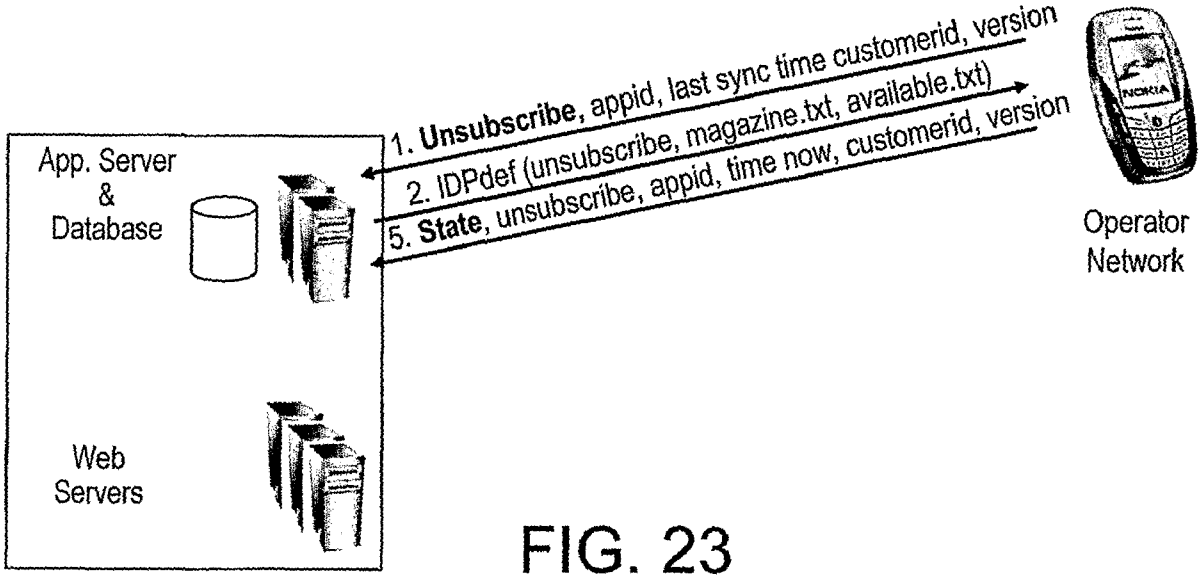

App. Server
&
Database
1. Unsubscribe, appid, last sync time customerid, version
2. IDPdef (unsubscribe, magazine.txt, available.txt)
5. State, unsubscribe, appid, time now, customerid, version
Operator
Network
Web
Servers

FIG. 23

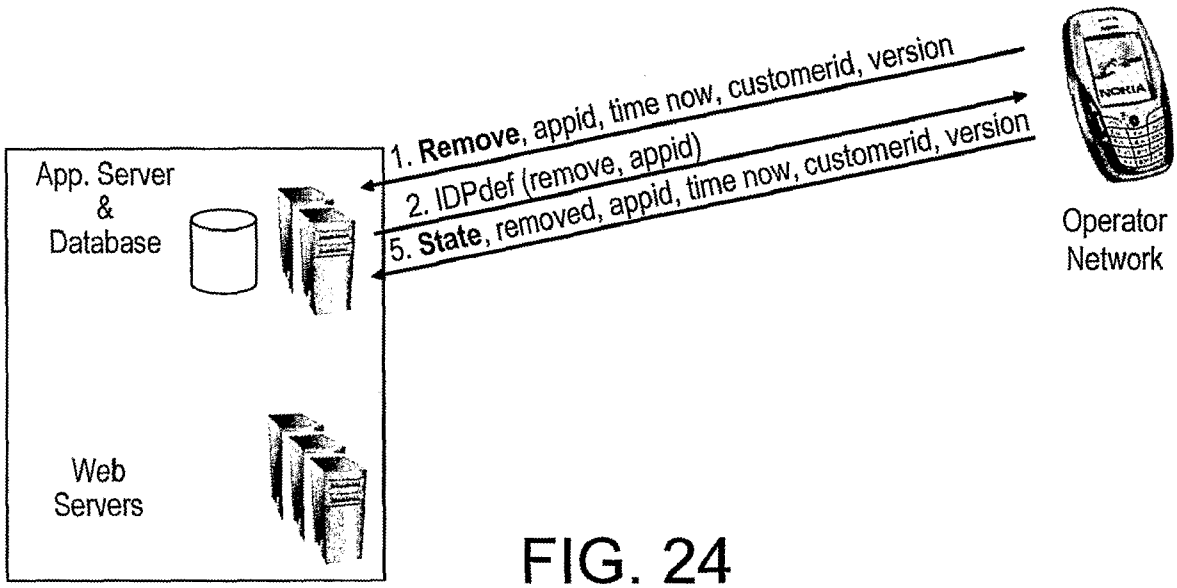

App. Server
&
Database
Web
Servers
1. Remove, appid, time now, customerid, version
2. IDPdef (remove, appid)
5. State, removed, appid, time now, customerid, version
Operator
Network

FIG. 24

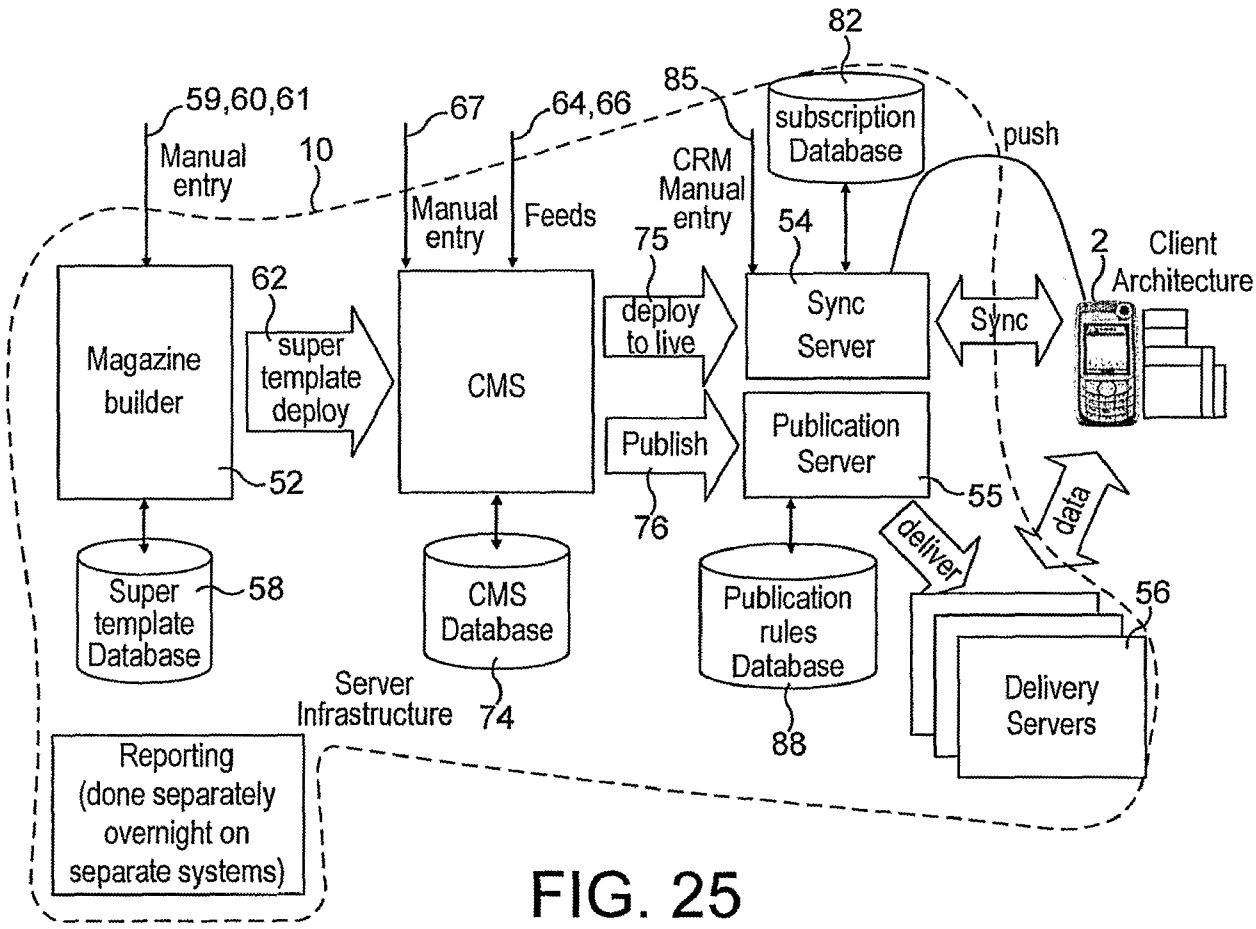

82
59,60,61
Manual
entry
10
67
64,66
Manual
entry
Feeds
85
CRM
Manual
entry
subscription
Database
push
54
75
2
Client
Architecture
62
Magazine
builder
super
template
deploy
CMS
deploy
to live
Sync
Server
Sync
Publish
Publication
Server
52
55
data
deliver
Super
template
Database
58
CMS
Database
76
Publication
rules
Database
56
Delivery
Servers
Server
Infrastructure
74
88
Reporting
(done separately
overnight on
separate systems)

FIG. 25

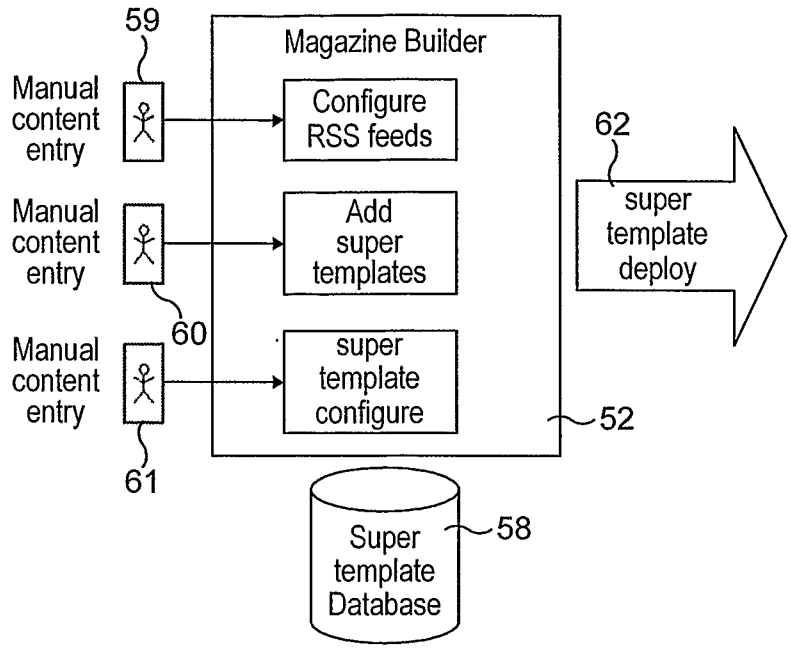

59
Magazine Builder
Manual content entry
Configure RSS feeds
62
super template deploy
Manual content entry
Add super templates
60
Manual content entry
super template configure
52
61
Super template Database
58

FIG. 26

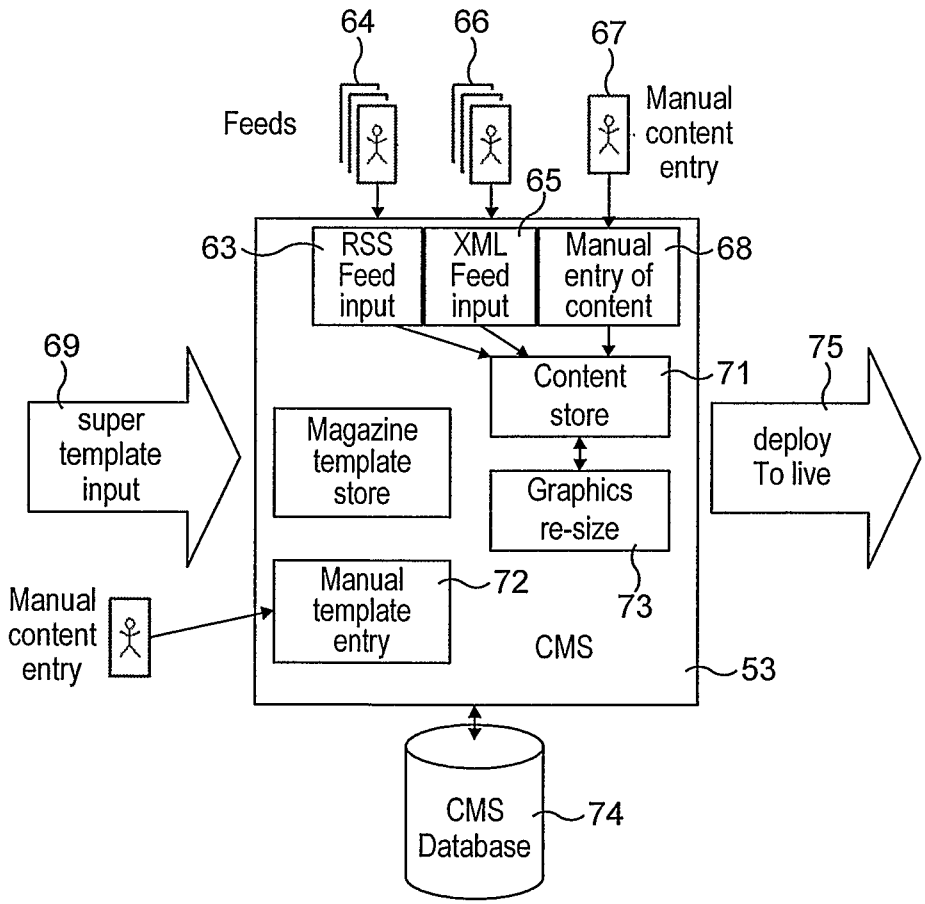

64
66
67
Feeds
Manual content entry
65
63
RSS Feed input
XML Feed input
Manual entry of content
68
69
super template input
Content store
71
75
Magazine template store
deploy To live
Graphics re-size
Manual content entry
Manual template entry
72
73
CMS
53
CMS Database
74

FIG. 27

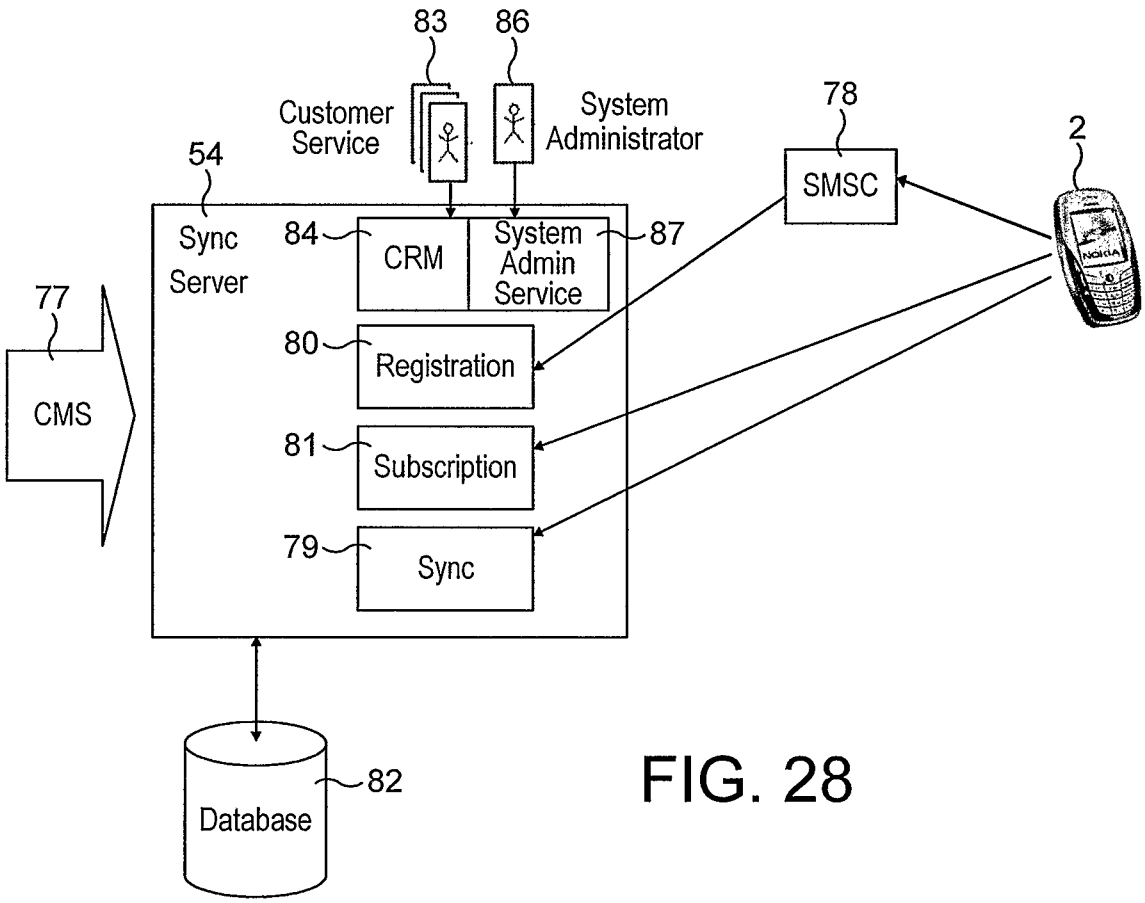

83
86
Customer Service
System Administrator
78
2
54
SMSC
Sync Server
84
CRM
System Admin Service
87
77
80
Registration
CMS
81
Subscription
79
Sync
Database
82

FIG. 28

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/002904

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04L29/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04L G06Q G06F

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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, INSPEC, COMPENDEX, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 119 135 A (AGILENT TECHNOLOGIES, INC. ; AGILENT TECHNOLOGIES INC) 25 July 2001 (2001-07-25) paragraph [0001] - paragraph [0002] paragraph [0027] - paragraph [0029] paragraph [0036] - paragraph [0039] paragraph [0050] - paragraph [0057] figures 1-3	1-33
Y	US 2002/188665 A1 (LASH THOMAS D) 12 December 2002 (2002-12-12) paragraph [0020] - paragraph [0024] paragraph [0054] - paragraph [0057] figures 1-3	1-33

-/--

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

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

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"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

Date of the actual completion of the international search	Date of mailing of the international search report
22 September 2006	02/10/2006

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Homan, Peter

1

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2006/002904

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2004/077340 A1 (FORSYTH JOHN MATTHEW) 22 April 2004 (2004-04-22) paragraph [0011] - paragraph [0025] paragraph [0082] - paragraph [0097] figure 12B	1-33

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2006/002904

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1119135 A	25-07-2001	JP 2001236310 A	31-08-2001
US 2002188665 A1	12-12-2002	WO 02088983 A1	07-11-2002
US 2004077340 A1	22-04-2004	EP 1346588 A2	24-09-2003
		WO 02052815 A2	04-07-2002
		GB 2373681 A	25-09-2002