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(54) Title: TARGETTED BANNER ADS

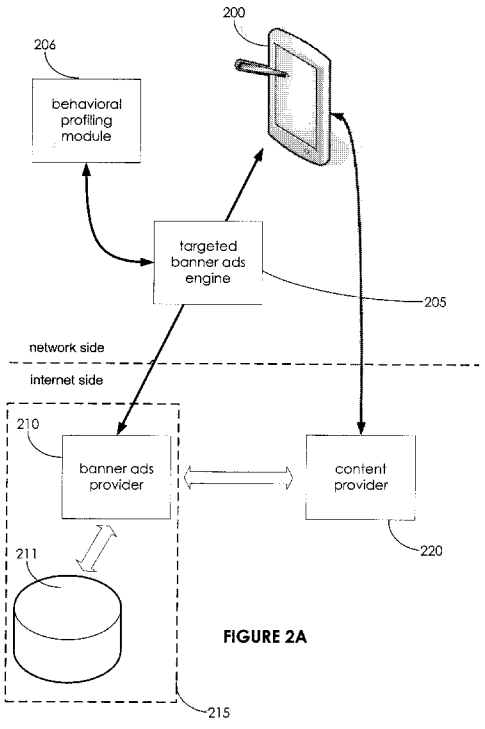

FIGURE 2A

(57) Abstract: The invention relates, in an operator network, to a method for pushing targeted banner ads in a webpage uploaded from a content provider by a user from said operator network, said webpage comprising scripting instructions for requesting a first banner ad from a banner ad server to be inserted in said webpage, the method comprising the acts of: - intercepting the request for the first banner ad resulting from the execution of the scripting instructions when the webpage is uploading by the subscriber, - selecting a targeted banner ad available from the banner ad server based on a user network profile, said user network profile resulting from the aggregation of data consumed by said user in the operator network, - transmitting a request for the targeted banner ad to the banner ad server in place of the intercepted request.

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TARGETED BANNER ADS

FIELD OF THE PRESENT INVENTION:

The present invention relates generally to the customization of advertisements and more specifically to the transmission of such ads over a computer network.

BACKGROUND OF THE PRESENT INVENTION:

Today there is an explosion of information accessible through the Internet, bringing in more and more audience. If this communication medium was at first promising for advertisers to reach this increasing audience, it becomes harder and harder for today's advertising networks to efficiently target internet users.

One possible way to reach out to internet users is through web banners (banner ads in short) that can be seen as a specific form of advertising on the World Wide Web. This form of online advertising consists in embedding an advertisement into a web page. It is intended to attract traffic to a website by linking to the website of the advertiser. The advertisement is constructed from an image (GIF, JPEG, PNG), JavaScript program or multimedia object employing technologies such as Silverlight, Java, Shockwave or Flash, often employing animation or sound to maximize presence. Images are usually in a high-aspect ratio shape (i.e. either wide and short, or tall and narrow) hence the reference to banners. These images are usually placed on web pages that have interesting content to users, such as e.g. a newspaper article, sports news, or an opinion piece.

A web banner is displayed when a web page that references the banner is loaded into a web browser. An illustration of a known system for displaying a web banner ad is shown in FIG. 1A. A communication device 100 (for instance a computer, laptop, smart phone and the likes) is equipped with a web browser to upload a webpage provided by a content provider 120 (or content publisher), for instance www.cnn.com, www.applestore.com ... The content provider 120 generally defines/allocates regions, spaces or boxes in its webpages that are reserved for the insertion of the banner ads. The banner ads can be found in

banner ad inventories 111 that are available to banner ads providers or publishers BAP 110, also called ad publishers. Ad inventories 111 and BAP 110 can be seen as forming an ad server 115. The content provider generally has agreements with a number of ad servers or banner ad providers for choosing what banner ads may be inserted in the allocated regions or boxes of their webpages.

Profiling techniques may be used to improve the efficiency of ads pushed to users. A targeted ad is an advertisement that is pushed to a party (user, household, device, ...) after a selection based on a profile of said party. If techniques are readily available to the man skilled in the art for pushing ads may through different means such as text messages, emails, ring tones, ... targeted ads on the internet are more difficult as a content provider has limited access if any to data related to the visitors to its webpages.

An illustration of a known method for pushing (i.e. inserting) to a first party a banner ad in an uploaded webpage is illustrated in FIG. 1B. A first party using device 100 may be for instance a user or subscriber to an internet service provider (ISP), shown through the ISP upper section in the FIG. 1A, this first party having access to content providers 120 through the ISP. In a preliminary act 130, the first party request for content, namely a webpage, from a content provider 120. This may be achieved through an http request (Hypertext Transfer Protocol) sent to the content provider 120 over the ISP network, which may transit over the internet if the content provider is outside the ISP network. The ISP network will also be referred to as the operator or carrier network as today ISP offers more services such as telephony, access to the internet, their own content providers such as media providers, TV, ...

In a further act 140, the content provider and/or the BAP may choose/select a banner ad for insertion in the webpage through scripting instructions related to that ad. These scripting instructions, or plugin, are provided by the banner ad provider 110 to the content provider 120. The scripting instructions related to the selected banner ad are instructions in a scripting language, which, when executed for instance in a web browser application, will retrieve this selected ad from an ad inventory 111 of the banner ad provider 110.

These scripting instructions may comprise generally:

- a selected ad to be inserted in the allocated region of the webpage,

- an address for the ad server 115, more precisely the banner ad inventory 111, from which the selected banner ad can be retrieved, and,

- the address or the name of the content provider, which selected the ad.

In a further act 150, the first party uploads the webpage sent by the content provider 120, which causes the browser application to execute the scripting instructions. As a consequence, using the information embedded in these instructions, one or more http requests are sent to the ad server 115, i.e. the banner ad inventory 111, for fetching the banner ad chosen by the content provider 120 or BAP 110. The ad server 115 will reply to these http requests with the chosen banner add which is subsequently loaded and displayed in the webpage (act 160) in the allocated region. One may note that these ads generally appear in the allocated regions with some latency, i.e. after the data linked to the content provider 120 itself are loaded. This is due to the fact that the webpage needs to be uploaded in the browser application to cause the execution of the scripting instructions.

When the first party clicks on the banner ad, he is directed to the website advertised in the banner ad as the banner ad generally comprises a re-direction link for redirecting the first party the advertised website. The advertised website may then record a visit from the initial webpage of the content provider. The content provider may itself keep a record of the clicking on the banner ad. Each click on a banner ad and the subsequent redirecting will generate revenue for the content provider.

Through the agreement with banner ad providers 110 (BAP), the content provider 120 knows which ads are available. The banner ads are generally identified through a tag or identifier. These ad tags are passed on parameters to the scripting instructions and are subsequently in the http requests to the BAP that can thus identity the chosen banner ad.

One problem today is that the banner ads are chosen randomly. When loading several times in a row a www.yahoo.com or www.cnn.com page for instance, the banner ads will keep on changing with randomly with no apparent logic. After a number of uploads of the same page, the same ads will appear

again, which gives at most an indication of the BAPs the content provider has an agreement. No targeting of the chosen ad seems to come into play.

It would be interesting at this point if the banner ad could be chosen based on some rules so as to offer targeted banner ads, i.e. banner ads that are of interest to the party uploading webpages from content providers.

US2006085263 proposes a method and apparatus for targeting advertising content. A content provider generates ad banners. The content provider transmits an agent to a target computer. The agent obtains user information and transmits the user information to the content provider. A program running on the content provider organizes the user information and updates a user specific database wherein all targeted banner ads are stored for a subsequent push to the target computer.

In this proposed solution, an agent needs to be downloaded to the targeted computer. Furthermore, a pre-storing (in the user specific database) of targeted ads is needed, which will require a lot of data storage if the method is generalized to a lot of target computers.

Today there is still a need for a simple and straightforward method for providing targeted banner ads to users. There is a further need for a solution that does not require large database for storing these ads ahead of their actual push to the user.

SUMMARY OF THE PRESENT MEIHOD AND SYSIEM:

It is an object of the present system to overcome disadvantages and/or make improvements in the prior art.

To that extend, the present invention proposes a method, in an operator network, for pushing targeted banner ads in a webpage uploaded from a content provider by a user from said operator network, said webpage comprising scripting instructions for requesting a first banner ad from an ad server to be inserted in said webpage, the method comprising the acts of:

- intercepting the request for the first banner ad resulting from the execution of the scripting instructions when the webpage is uploading by the subscriber,

- selecting a targeted banner ad available from the ad server based on a user network profile, said user network profile resulting from the aggregation of data consumed by said user in the operator network,

- transmitting a request for the targeted banner ad to the ad server in place of the intercepted request.

The present method allows substituting a request for a first banner ad with a request for a targeted banner ad. The substitution is done on the fly, after the execution of the scripting instructions for the first banner ad generates one or more requests to the ad server.

The targeting of the banner ad is facilitating by the profiling of the subscriber through its usage/consumed data over the operator network. The usage data may be seen as the raw data resulting from a user who is browsing the web, using multimedia, or even his phone experience as described later on. This information is essentially a collection of a subscriber's behavior without any analysis. Some processing and analysis of this usage data helps to make intelligent judgments about the subscriber's preferences. The network profile may be seen as the processed output from the analyzed usage data. Once analyzed, the usage data may help the operator of a network to provide personalized recommendations.

This consumed data available at the network level is used in the present method to generate a subscriber profile. This network level information contains all the relevant information that completely defines a user. Thanks to the present method, there is no need for an agent on the user's device. No storage of banner ads is required beside a banner ad inventory from the ad server. The intervention is transparent to the user. The network profile may furthermore be short-lived (based on recent consumed data from the user) or spanning over a longer period of time.

In an additional embodiment of the present method, a banner ad is characterized by an ad identifier, the act of transmitting a request comprising the act of substituting the first ad identifier by the targeted banner ad identifier.

In an additional embodiment of the present method, the data consumed by the user comprises keywords input from a search query sent to a search engine.

The present invention also relates to a banner ad engine provided in an operator network for pushing targeted banner ads in a webpage uploaded from a content provider by a user from said operator network, said webpage comprising scripting instructions for requesting a first banner ad from an ad server to be inserted in said webpage, the banner ad engine being arranged to:

- intercept the request for the first banner ad resulting from the execution of the scripting instructions when the webpage is uploading by the subscriber,
- select a targeted banner ad available from the ad server based on a user network profile, said user network profile resulting from the aggregation of data consumed by said user in the operator network,
- transmit a request for the targeted banner ad to the ad server in place of the intercepted request.

In an additional embodiment of the present engine, a banner ad is characterized by an ad identifier, the present engine being arranged to substitute the first ad identifier by the targeted banner ad identifier.

In an additional embodiment of the present engine, the data consumed by the user comprises keywords input from a search query sent to a search engine.

The present invention also relates to a system for pushing targeted banner ads in a webpage uploaded from a content provider by a user from an operator network, said webpage comprising scripting instructions for requesting a first banner ad from an ad server to be inserted in said webpage, the system comprising

- a behavioral profile engine arranged to:
  - aggregate the data consumed by the user in the operator network
  - generate a network user profile for the consumed data,
- a communication device arranged to:
  - upload from the content provider the webpage through an application,
  - executed the scripting instructions,
- a banner ad engine arranged to:

- intercept the request for the first banner ad resulting from the execution of the scripting instructions when the webpage is uploading by the subscriber,
- select a targeted banner ad available from the ad server based on a user network profile, said user network profile resulting from the aggregation of data consumed by said user in the operator network,
- transmit a request for the targeted banner ad to the ad server in place of the intercepted request.

The present invention also relates to a computer readable carrier including computer program instructions that cause a computer to implement a method for pushing targeted banner ads in a webpage uploaded from a content provider by a user from said operator network, said webpage comprising scripting instructions for requesting a first banner ad from an ad server to be inserted in said webpage, the readable carrier comprising:

- instructions for intercepting the request for the first banner ad resulting from the execution of the scripting instructions when the webpage is uploading by the subscriber,
- instructions for selecting a targeted banner ad available from the ad server based on a user network profile, said user network profile resulting from the aggregation of data consumed by said user in the operator network,
- instructions for transmitting a request for the targeted banner ad to the ad server in place of the intercepted request.

BRIEF DESCRIPTION OF THE DRAWINGS:

The present system and method are explained in further detail, and by way of example, with reference to the accompanying drawings wherein:

FIG. 1A shows an exemplary embodiment of a known system for providing banner ads in a webpage,

FIG. 1B shows an exemplary embodiment of a known method for providing banners ads in a webpage,

FIG. 2A shows a first exemplary embodiment of the present system for pushing targeted banner ads in a webpage,

FIG. 2B shows a first exemplary embodiment of the present method for pushing targeted banners ads in a webpage,

FIG. 3 shows an illustration of a system to collect and aggregate subscribers usage data over an operator network,

FIG. 4A shows a second exemplary embodiment of the present system for pushing targeted banner ads in a webpage, and;

FIG. 4B shows a second exemplary embodiment of the present method for pushing targeted banners ads in a webpage.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS:

The following are descriptions of exemplary embodiments that when taken in conjunction with the drawings will demonstrate the above noted features and advantages, and introduce further ones.

In the following description, for purposes of explanation rather than limitation, specific details are set forth such as architecture, interfaces, techniques, etc., for illustration. However, it will be apparent to those of ordinary skill in the art that other embodiments that depart from these details would still be understood to be within the scope of the appended claims.

For example, the invention allows the provision of targeted banner ads taking into a subscriber network profile, and is described here after in its application to webpages. The man skilled in the art will notice that this is not the sole embodiment possible, and that the system and method according to the invention may be implemented to documents available on one or more databases, accessible through a local network. Other embodiments are readily available to the man skilled in the art.

Moreover, for the purpose of clarity, detailed descriptions of well-known devices, systems, and methods are omitted so as not to obscure the description of the present system. In addition, it should be expressly understood that the drawings are included for illustrative purposes and do not represent the scope of the present system.

FIG. 2A shows an exemplary embodiment of the present system. An operator's network is illustrated on the upper part of FIG. 2A while a content provider and BAP are represented on the lower part. The content provider may

be a distant node from the operator's network or part of it. The same can be said for the banner ad provider 210 associated with an ad inventory 211.

The operator's network may be seen as all the infrastructure in control of an operator, and that provides to subscribers to said operator communication services (voice, internet, TV, ...). The operator may be a telco (Orange, AT&T, Verizon, ...) or a cable operator (Comcast, One of more gateways (not shown in FIG. 2A) are provided to allow the subscribers to access services and content hosted by distant nodes, like e.g. a content provider 220.

A subscriber, here after also referred to as a user, of the operator's network may access a webpage from his communication device 200, for instance a personal computer, a laptop, a smart phone, a PDA (personal digital assistant) and the likes.

A web page or webpage can be seen as a resource of information that is suitable for the World Wide Web and can be accessed through a web browser hosted on a communication device. This information is usually in HTML or XHTML format, and may provide navigation to other web pages via hypertext links. Web pages may be retrieved from a local computer or from a remote web server. Web pages are requested by applications running on a device, and served from web servers, seen as content providers, using Hypertext Transfer Protocol (HTTP). Web pages may consist of files of static text stored within the web server's file system (static web pages), or the web server may construct the (X)HTML for each web page when it is requested by an application such as a browser application (dynamic web pages). Client-side scripting can make web pages more responsive to user input once in the client browser. The here after banner ads are generally implemented through these client side scripting instructions uploaded with the webpage. The instructions are then executed through the web browser to retrieve a banner ad from ad servers.

The webpage provided by a content provider 220 may comprise one or more banner ads selected from a plurality of stored banner ads in an ad inventory 211. As explained in relation to FIGs. 1A and 1B, the content provider 220 is affiliated (has agreement) with one or more banner ad providers 210 which provide(s) the banner ad plugins taken from the ad inventory 211 for insertion into a webpage generated by content provider 220. The ad inventory

211 and the banner ad provider 210 can be seen as forming an ad server 215 that allows the selection and the provision of banner ads to a content provider or publisher such as content provider 220.

In the exemplary embodiment of FIG. 2A, a banner ad engine 205 is provided in the present system. This banner ad engine can monitor the http request to the ad server 215 for retrieving a banner ad and resulting from the execution of the scripting instructions when a webpage is uploading by the subscriber. As seen before with the existing systems, these requests may comprise:

- a selected ad to be inserted in the allocated region of the webpage,
- an address for the ad server 215, more precisely the ad inventory 211, from which the selected banner ad can be retrieved, and,
- the address or the name of the content provider, which selected the ad.

The banner ad engine 205 may be implemented through software and hosted on a node or server in the operator network. In the present system, the request to the ad inventory 211 may be routed through the banner ad engine 205 so that the may alter/modify the request so as to change the banner initially inserted by the content provider 220.

To that extend, a behavioral profiling module 206 is further provided to generate subscribers profiles. The profiling module 206 and the targeted banner engine 205 may be part of the same server or hosted on operatively connected servers in the operator network. This profiling module 206, illustrated later on in FIG. 3, may for instance:

- collect data consumed by the subscriber when accessing the operator network,
- aggregate said data to built a network profile for the subscriber.

In the present system, the banner ad engine 250 is adapted to:

- selecting a targeted banner ad available from the ad inventory 211 of the banner ad provider 210 based on the user network profile,
- transmitting a request for the targeted banner ad to the banner ad provider in place of the intercepted request.

Known profiling techniques, readily available to the man skilled in the art may be used by the profile module 206 to aggregate the collected consumed

data into a subscriber network profile.

An exemplary embodiment of the present method is illustrated in FIG. 2B. This embodiment may be carried out by the targeted banner ad engine 205. In a preliminary act 230, a subscriber to an operator network uses a device 200 to access a webpage provided by a content provider 220. This may be achieved through an http request sent to the content provider 220 over the operator network. The request to the content provider may be generated through the use of a web browser application running on the device 200.

In a further act 240, the content provider will choose/select a banner ad and insert in the webpage the scripting instructions – or plugin – related to that ad. The banner ads (scripting instructions) are generally provided by a BAP 210 and retrieved from the ad inventory 211 of said BAP 210. As mentioned in relation to FIGs. 1A and 1B, the selection of a banner add may be based on agreements between the content provider 220 and the BAP 210. The scripting instructions related to the selected banner ad are instructions in a scripting language, which, when executed for instance in a web browser application, will retrieve this selected ad from the ad inventory 211 of the banner ad provider 210. Alternatively, BAP 210 may be the network entity selecting the banner ad in place of the content provider 220 (as defined in the agreements between content provider and BAP).

These scripting instructions may comprise generally:

- a selected ad to be inserted in the allocated region of the webpage. In an additional embodiment of the present method, the selected ad may be identified through an ad tag. The content provider, through an agreement with a BAP may have access to the available banner ads through their corresponding tag, which then will be used by the BAP to identify and then push the selected ad to the subscriber uploading the webpage,

- an address for the ad inventory 211, from which the selected banner ad can be retrieved, and,

- the address or the name of the content provider 220, which selected the ad. This last field may be used for tracking the clicks from the subscriber. This field is not necessary as the tracking of clicks for statistics and revenue purpose is beyond the scope of the present method and system. Indeed this may be

achieved as mentioned before through the redirection when a user clicks on the bannerad.

Optionally, the scripting instructions may comprise an indication of the BAP 210 which provided the banner ad plugin. Alternatively, the scripting instructions may comprise an indication of the ad server 215 which provides the the bannerad plugin through its two components, the ad inventory 211 and the BAP 210 respectively.

In a further act 250, the first party uploads the webpage sent by the content provider 220, which causes the browser application to execute the scripting instructions. As a consequence, using the information embedded in these instructions, one or more http requests are sent to the ad inventory 211for fetching/retrieving the bannerad chosen by the content provider 220.

In an additional act 252 of the present method, the targeted bannerad engine 205 will intercept the request(s) resulting from the execution of the scripting instructions. One possible way of making the engine 205 aware of these requests may result from agreements between the operator of the network and the BAP 210 (or more generally the ad server 215). As the requests to the ad inventory 211 will comprise an indication of the ad inventory address, the engine 205 may filter the monitored requests for any recipient ad inventories listed in such agreements. When the BAP or ad server address is provided in the scripting instructions, the filtering of the bannerad engine 205 may be performed on this address.

In a further act 254, the bannerad engine 205 will retrieve the subscriber's profile available from the profiling module 206. The network may readily identify the user uploading the page as a subscriber to the network, through e.g. the IP address wherefrom the webpage is uploaded. The profile can then be retrieved through matching the profiling module database with an identifier for the subscriber, either his IP address or another identifier associated to the subscriber IP address. The subscriber profile will help the bannerad engine 205 to select a targeted bannerad, i.e. an ad that better matches the subscriber's interests, as defined from his profiling.

As mentioned earlier, network operator/BAP or network operator/content provider agreements may exist to facilitate the implementation of the present

method. These agreements may be used for instance to select the targeted banner ad based on the retrieved subscriber's profile. Thanks to the above mentioned agreements, the banner ad engine 205 may either:

- be given access to the ad inventory 211 to select the targeted banner ad to push to the subscriber,

- get regular updates from the BAPs the network has an agreement with to select "locally available" (i.e. in a network accessible ad inventory wherein the available ads as well as these updates would be stored) targeted banner ads.

In a further act 256, the banner ad engine 205 will replace in the intercepted request the initial banner ad (as selected by the content provider 220) with the targeted banner ad as chosen from the subscriber's profile. In order to facilitate the choice of the targeted banner ad, banner ads may furthermore be indexed according to categories, keywords ... that can be matched with the retrieved subscriber's profile. The request for a banner ad then becomes a request for the targeted banner ad. The selection of the targeted banner ad may be carried out by the banner ad engine 205. Alternatively the banner ad engine, once intercepted the request to the ad inventory, may query an advertisement service node (not shown in FIG. 2A) with the subscriber profile, the advertisement service node replying with a targeted banner ad to push to the subscriber, based on his profile.

In the additional exemplary embodiment wherein the banner ad are identified through ad tags, the banner ad engine 205 will carry out act 256 through changing in the intercepted request the ad tag for the initially selected ad with the targeted banner ad tag.

In a further act 258, the banner ad engine 205 will then forward the request for the targeted banner ad in place of the intercepted request. The ad inventory 211 will then reply upon receiving the request for the targeted banner ad by providing to the requester (i.e. the device 200, more specifically the browser application executing the scripting instructions) the targeted banner ad. This ad will be uploaded and displaying in the webpage in a further act 260.

One possible approach to increase advertising effectiveness is to develop profiles of interest for users by searching and analyzing their behavior. Typically a

profile may be generated for a user, a subscriber household or a communication device depending on the type of information which is monitored. FIG. 3 is an illustration of an exemplary embodiment of the profiling module 206.

Through the operator's network, a subscriber i.e. a user may enjoy services like telephony 301, internet access 302 and media access 303 (TV, video, music, ...). In the present system, the operator, through its infrastructure, has access to the usage data generated by subscribers through different paths described hereafter.

One possible path to aggregate the data consumed by a subscriber is the use of networks sniffers 340, provided to sniff, i.e. record, the data consumed by the user, whether these data are content accessed by his mobile 301, their computer 302 or even through a media device 303. A sniffer (also known as a network analyzer or protocol analyzer or, for particular types of networks, an Ethernet sniffer or wireless sniffer) may be seen as a computer software or computer hardware that can intercept and log data packet traffic passing over a digital network or part of a network. A network sniffer may also be seen as an application that passively records any packet traffic that runs through a given network point. The sniffer will pick up all the IP packets for every internet protocol.

A sniffer may be located at the network gateway to the world wide web or within the network for network services. A sniffer may also for instance be located in a residential gateway to sniff the subscriber experience. An example of a sniffer may be the network analyzers provided by Packeteer® or more generally an intercepting proxy (to intercept all the traffic passing through it). Once a sniffer has recreated the HTTP and HTTPS traffic corresponding to the packet traffic, this sniffer 340 then creates a web log file. Thus, every "hit" to a webpage for instance, including each view of a HTML document, image or other object, may be logged. Every media consumed may also be recorded. The records may contain (but not limited to) information about the URL of the page, keywords, category of media, location, time of the date, date, ...

The output from the network sniffers 340 may be stored in offline operator's logs, respectively the mobile logs, the internet logs and the media

logs for each subscriber.

Another usage data source is the CRM (Customer Resource Management) databases that are also maintained in the operator's network. The mobile, internet and media CRM databases are respectively dedicated for telephony, internet and media. They are repositories of data records relating to each customer or subscriber to the network. By way of illustration and not as a limitation, a data record within any of the CRM databases may comprise subscription details such as:

- for how long has the customer signed up for services,
- what services (data/voice),
- what grade of service (basic, medium, best class), i.e. his/her level of subscription,
- number of lines,
- users payment score,
- history of actions (orders, complaints, proposals),
- user preferences, and;
- user personal data (e.g. name, age, address, fixed telephone, date of birth, profession, personal email address), also referred to the demographic data of a user here after.

The whole usage data collected (the mobile, internet and media operator's logs respectively, as well as the mobile, internet and media CRM respectively) for each subscriber is processed by the profile engine 206 to determine for each subscriber a (subscriber) network profile. Known profiling techniques, readily available to the man skilled in the art may be used at this point by the profile engine 206 to aggregate the collected content data into subscriber network profiles. The profiling may be approached for instance from a user point of view or from an accessed (duration, frequency or location) point of view.

A subscriber profile may for instance be based on a short or a long period of time, depending on whether short or long trends ought to be taken into account. For instance, for a short lived profile, only the recent experience (e.g. within the same day, week ...) is taken into account to generate the profile, which is consequently constantly updated. Depending on the type/category of

content provider, different subscriber profiles may also be created for the same subscriber, for instance a news profile, a sports profile ... so as to improve the selection of the targeted banner ad. When a content provider belongs to one of these categories, the corresponding profile will be retrieved to select the targeted banner ad. The payments over the internet may also be emphasized as they can show that a subscriber is interested in a certain type of goods. Banner ads related to these goods or similar ones may be favored for such a subscriber.

As illustrated here after in the exemplary embodiment of a home network, the profile of a user may be based on his recent search queries, using the keywords (clear text entries) to build a user profile for the targeted banner ad selection.

One particular implementation of the present system is for residential gateways (RGs) and the present method is used to push relevant/targeted banner ads on the plurality of devices connected to the RG in the same home.

Fig. 4A is an illustration of a known residential gateway environment. A Residential Gateway (RG) 425 in Telco or Cable network (not shown in FIG. 4A) is responsible for Triple play services (media, internet, phone). RG 425 has two types of interface WAN (Wide Area Network) and HAN (Home Area Network):

- WAN interface connects to external phone wire (DSL), cable or fiber coming into home, notably to access the network, and the internet,

- HAN includes network inside the home (referred to as the home network here after) which may be Ethernet, Wi-fi, HPNA, Bluetooth etc. through which the plurality of the home devices 400 access the network.

There are three types of Residential Gateways depending on hardware and software modules present inside.

a. Hybrid mode RG: RG has both a router 426 and a bridge module 427 present inside. Some home devices may connect to Router and some to Bridge depending on Network Architecture of carrier.

b. Routed mode RG: RG has only router module 426 present inside. All devices in home connect to Router.

c. Bridge mode RG: RG has only bridge module 427 present inside. All devices in home connect to Bridge.

The IP address used to identify the subscriber, as described early on, may not be enough in the present RG environment as the IP address is allocated to the RG itself and not to the devices 400 of the home environment.

Indeed, from the WAN side, the RG IP address will be assigned by the operator (i.e. carrier) through a DHCP (Dynamic Host Configuration Protocol) request. Carriers generally assign one IP address, called public IP address, to a RG, whether its mode is hybrid, routed or bridged.

From the HAN side, all devices 400 will share the public IP address assigned to RG 425. If individual IP addresses may be assigned to all devices 400 in the near feature through IPv6, today, the public IP address is shared with all devices 400 in the same home network. As a direct consequence, individual devices are hidden from the external world. In such an environment, RG 425 acts as a router for IP packets from and to the home network. To that extend, devices 400 may be identified by RG 425 through their MAC address as well as the port used by the application sending/receiving IP packets. Private IP addresses allocated by RG 425 may also be used. Requests from applications running on a device 400 may be characterized by a TO/FROM address as well as the port used by the application to send the request. To rout the IP packets, RG 425 will store in a table tying an application request to a device through its MAC, private IP address (if any) the port used by the application, and the recipient address (content provider for instance) of the request. When the content provider replies with a webpage, RG 425 will identify the origin of the reply, and will use the table to rout the reply to the right device 400.

A problem arises regarding targeted banner ads if the banner ad engine is hosted within the network. No individual profiling of users/devices from the same home network is possible as the banner ad engine may only see them as one IP public IP address. This is indeed true for hybrid and routed mode RGs as in a bridge mode RG, the home devices are visible to outside world.

The here after additional exemplary embodiment of the present method will be illustrated with an either hybrid or routed mode RG. When a home device 400 is hidden to the operator network, there will be no way to profile a subscriber. Indeed, the subscriber is in this present case a household, comprising one or more residential consumers (or home users), who all share the same

identifier, i.e. the public IP address. Carrier could profile consumers based on IP address of RG by sniffing data at DSLAM 416 (Digital Subscriber Line Access Multiplexer), backhaul or at BRAS (broadband remote access server), but this profiling will be incorrect because the same IP address is used by all home users. Hence to achieve a relevant profiling, each device 400 has to be profiled separately. This profiling ought to be performed at the RG 425 level as any device 400 form the home network is invisible beyond RG 425. For bridge mode RG, as the devices are visible to the outside of the home network, the present teaching may be applied at the DSLAM level.

FIG. 4B is an illustration of an exemplary embodiment of the present system. A content provider 420 is accessible from a device 400 of the home network through RG 425, DSLAM 426, and the operator carrier network (opening on to the internet). A banner ad provider 410 has access to a plurality of banner ads from an ad inventory 411. The banner ad engine 405 is provided as a module within the RG 425 for implementing the present method, and may be operatively coupled to banner ad engine 405. Indeed, such a module may easily intercept the request for the banner ads as RG 425 is the gateway to the carrier network for accessing any content, including the content provider 420 and the BAP 410.

The banner ad engine 405 is arranged to carry out the present method as illustrated in relation to FIG. 2B. The retrieval of the user's profile (act 254) may be carried out as follows to allow the distinction of the different devices 400 besides the unique public IP address.

To that effect, a behavioral profiling module BPM 406 is further provided in RG 425. BPM 406 may have one or more of the following capabilities:

a. Learn MAC and IP address of all the device 400 present in HAN

b. Detect the device type like Media Server, PC, Camera, Music player ...

c. Detect application type like media player, game player...

d. Analyze the telephone call record

e. Detect system's browsing pattern through sniffing of visited webpages.

The Media Access Control address (MAC address) or Ethernet Hardware Address (EHA), hardware address, adapter address or physical address is a

quasi-unique identifier assigned to most network adapters or network interface cards (NICs) by the manufacturer for identification.

BPM 406 and banner ad engine can be seen as logical egress interfaces of RG 425. All upstream data going through RG 425 is sniffed by BPM 406. A device profile may be generated:

- through identifying each device using either its MAC address or a private address generated by RG 425, this for instance may be based taping into the table kept at RG 425 and mentioned earlier to sniff the device's consumed data,

- over a given period of time, depending on how the user is apprehended.

When a device identifier is used, the sniffing may be performed per device by BPM 406. Thus, BPM may generate a profile per device, which will be retrieved (act 254) by RG 425 when a request for a banner ad sent from this device is intercepted. The identifier is used in place of the public IP address, RG 425 ensuring the proper routing by keeping track of which device sends which request.

Another approach is to generate through BPM 406 short lived profiles, i.e. profiles that are linked to a given device 400 of the home network for a short time such as a connection time to the network. The profiling may be carried out over a certain duration of data consumption, any older data being discarded and replaced by newly consumed data.

BPM at RG uses above consumed data to build a profile per device in the home network. This profile is built dynamically in real-time and is destroyed quickly as the device can show behavioral changes due to a change in the activity of one residential consumer during his current use, or a different residential consumer started to use the same device. System behavior may also change if a home user launches applications like Itunes or games on the device which will lead to different profiling. In most of the homes Analog telephone line is connected to RG and if RG acts as SIP user agent, BPM may sniff called party number and if it is commercial number then relevant ads are pushed on PC. For example, if someone dials for pizza then pizza ad is pushed to browser if at that instant user is browsing. The RG will again act as a router of the incoming

targeted banner ad sent by the BAP in response to a request for a banner ad.

Another example is when a user is sending a query with keywords to a search agent, available on a content provider 420. BPM 406 may sniff the keywords as consumed data (the request to the search engine) going through RG 425. A short-lived profile may be based on these keywords. Any subsequent query to a content provider (either the same search engine or another content provider) may cause the device to upload a webpage with banner ads. The banner ad engine with then intercept the request(s) for banner ads and used this short-lived profile to select a targeted banner ad and insert it into the intercepted request.

For instance, a user types on a google search page the keywords "pizza + san Francisco + delivery". BPM may detect these direct keyword entries, and build a simple profile based on these entries. The banner ad engine 405 will later on, as the user upload a cnn.com webpage, push targeted banner ad for a local pizza restaurant in San Francisco that ensures pizza delivery over the whole city.

In the here above description, reference was made to a banner ad server, or ad server in short, comprising two parts, the ad inventory for storing banner ads, and the banner ad provider that provides the scripting instructions related to the banner ads to the content provider needing such banner ads. This illustration as two parts is in no way limiting as these two parts could be hosted by the same network entity, or being operatively linked to each other. The two part presentation helps to illustrate the different tasks performed by the ad server 215 of the present system.

Furthermore, reference was also made to the ad inventory 211, which comprises both the banner ad initially inserted by the content provider 220, and the selected banner ad, that will replace this initial banner ad. As mentioned before, the selected banner ad, based on the user profile, may be selected from another ad inventory, distinct from ad inventory 211. These distinct ad inventories may be seen as part of the same ad server 215, as they are both operatively linked to the same BAP 210.

Obviously, readily discernible modifications and variations of the present indexer are possible in light of the above teachings. It is therefore to be understood

that within the scope of the appended claims, the present invention may be practiced otherwise than as specifically described herein. For example, while described in terms of hardware/software components interactively cooperating, it is contemplated that the invention described herein may be practiced entirely in software. The software may be embodied in a carrier such as magnetic or optical disks, or a radio frequency or audio frequency carrier wave.

For instance, in order to ensure a proper profiling of a user, this user may register with a node that monitors all his browsing experience, an agent may be provided on his device to collect the data when the method is not performed at the operator's level. A user may also be identified through his network ID, the monitoring of his consumed data being carried out through sniffing data consumed by the party identified in the network with this network ID. The subsequent request for banner ads (from an initial webpage uploaded on a device) could be linked to the user through his network ID.

Furthermore, BPM and banner ad engine have been presented as separate logical entities, they may nonetheless be part of the same entity in the network, like for instance RG 425.

Thus, the foregoing discussion discloses and describes merely exemplary embodiments of the present invention. As will be understood by those skilled in the art, the present invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting of the scope of the present invention, as well as other claims. The disclosure, including any readily discernible variants of the teachings herein, define, in part, the scope of the foregoing claim terminology such that no inventive subject matter is dedicated to the public.

The section headings included herein are intended to facilitate a review but are not intended to limit the scope of the present system. Accordingly, the specification and drawings are to be regarded in an illustrative manner and are not intended to limit the scope of the appended claims.

In interpreting the appended claims, it should be understood that:

a) the word "comprising" does not exclude the presence of other elements or acts than those listed in a given claim;

b) the word "a" or "an" preceding an element does not exclude the presence of a plurality of such elements;

c) any reference signs in the claims do not limit their scope;

d) several "means" may be represented by the same item or hardware or software implemented structure or function;

e) any of the disclosed elements may be comprised of hardware portions (e.g., including discrete and integrated electronic circuitry), software portions (e.g., computer programming), and any combination thereof;

f) hardware portions may be comprised of one or both of analog and digital portions;

g) any of the disclosed devices or portions thereof may be combined together or separated into further portions unless specifically stated otherwise;

h) no specific sequence of acts or steps is intended to be required unless specifically indicated; and

i) the term "plurality of" an element includes two or more of the claimed element, and does not imply any particular range of number of elements; that is, a plurality of elements can be as few as two elements, and can include an immeasurable number of elements.

CLAIMS

What is claimed is:

1. In an operator network, a method for pushing targeted banner ads in a webpage uploaded from a content provider by a user from said operator network, said webpage comprising scripting instructions for requesting a first banner ad from a banner ad server to be inserted in said webpage, the method comprising the acts of:

- intercepting the request for the first banner ad resulting from the execution of the scripting instructions when the webpage is uploading by the subscriber,

- selecting a targeted banner ad available from the banner ad server based on a user network profile, said user network profile resulting from the aggregation of data consumed by said user in the operator network,

- transmitting a request for the targeted banner ad to the banner ad server in place of the intercepted request.

2. The method of claim 1, wherein a banner ad is characterized by an ad identifier, wherein the act of transmitting a request comprises the act of substituting the first ad identifier by the targeted banner ad identifier.

3. The method of claim 1, wherein the data consumed by the user comprises keywords input from a search query sent to a search engine.

4. In an operator network, a banner ad engine for pushing targeted banner ads in a webpage uploaded from a content provider by a user from said operator network, said webpage comprising scripting instructions for requesting a first banner ad from a banner ad server to be inserted in said webpage, the banner ad engine being arranged to:

- intercept the request for the first banner ad resulting from the execution of the scripting instructions when the webpage is uploading by the subscriber,

- select a targeted banner ad available from the banner ad server based on a user network profile, said user network profile resulting from the aggregation of data consumed by said user in the operator network,

- transmit a request for the targeted banner ad to the banner ad server in place of the intercepted request.

5. The engine of claim 4, wherein a banner ad is characterized by an ad identifier, said engine being arranged to substitute the first ad identifier by the targeted banner ad identifier.

6. The engine of claim 4, wherein the data consumed by the user comprises keywords input from a search query sent to a search engine.

7. A system for pushing targeted banner ads in a webpage uploaded from a content provider by a user from an operator network, said webpage comprising scripting instructions for requesting a first banner ad from a banner ad server to be inserted in said webpage, the system comprising

- a behavioral profile engine arranged to:
  - aggregate the data consumed by the user in the operator network
  - generate a network user profile for the consumed data,
- a communication device arranged to:
  - upload from the content provider the webpage through an application,
  - executed the scripting instructions,
- a banner ad engine arranged to:
  - intercept the request for the first banner ad resulting from the execution of the scripting instructions when the webpage is uploading by the subscriber,
  - select a targeted banner ad available from the banner ad server based on a user network profile, said user network profile resulting from the aggregation of data consumed by said user in the operator network,
  - transmit a request for the targeted banner ad to the banner ad server in place of the intercepted request.

8. The system of claim 7, wherein a banner ad is characterized by an ad identifier, the banner ad engine being arranged to substitute the first ad identifier by the targeted banner ad identifier.

9. The system of claim 7, wherein the data consumed by the user comprises keywords input from a search query sent to a search engine.

10. A computer readable carrier including computer program instructions that cause a computer to implement a method for pushing targeted banner ads in a webpage uploaded from a content provider by a user from said operator network, said webpage comprising scripting instructions for requesting a first banner ad from a banner ad server to be inserted in said webpage, the readable carrier comprising:

- instructions for intercepting the request for the first banner ad resulting from the execution of the scripting instructions when the webpage is uploading by the subscriber,

- instructions for selecting a targeted banner ad available from the banner ad server based on a user network profile, said user network profile resulting from the aggregation of data consumed by said user in the operator network,

- instructions for transmitting a request for the targeted banner ad to the banner ad server in place of the intercepted request.

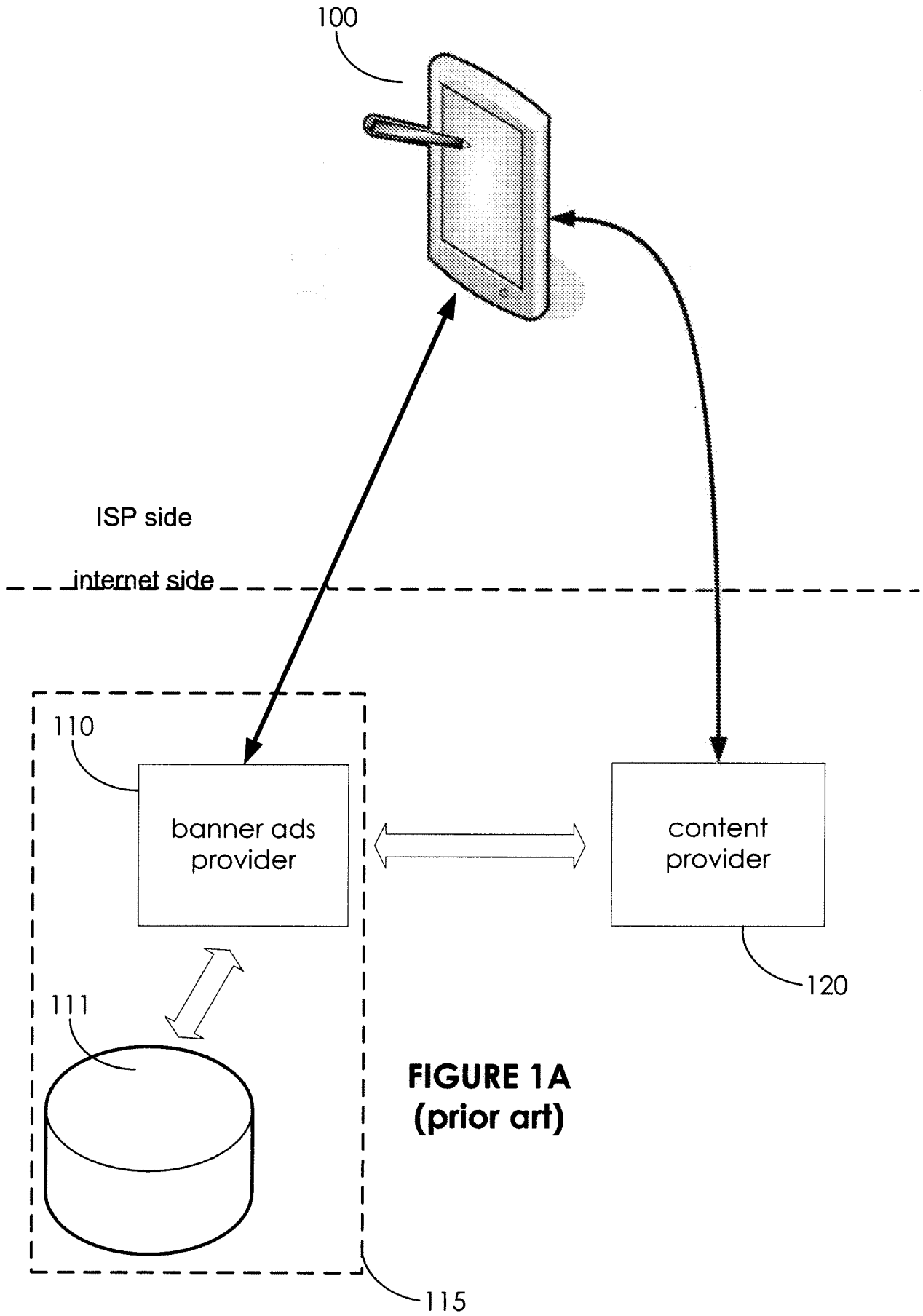

FIGURE 1A (prior art)

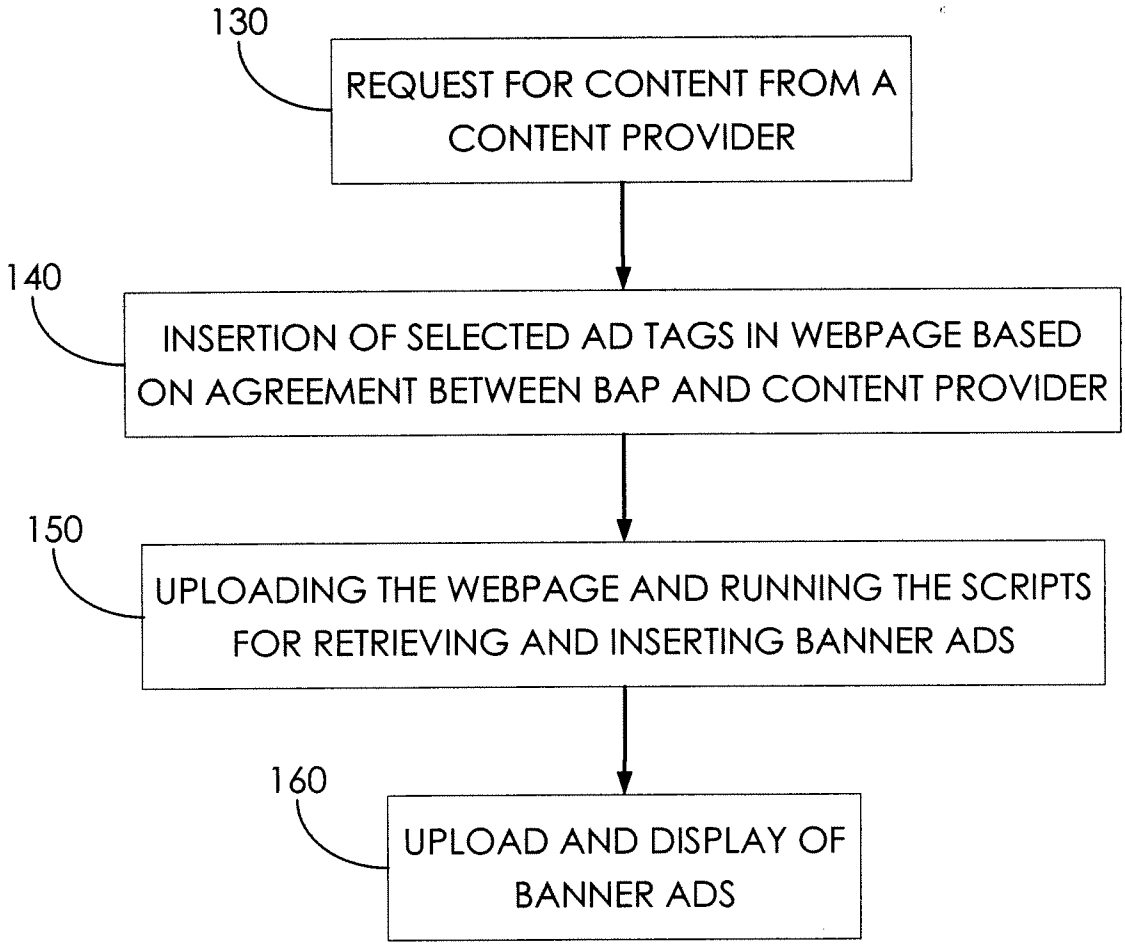

FIGURE 1B
(prior art)

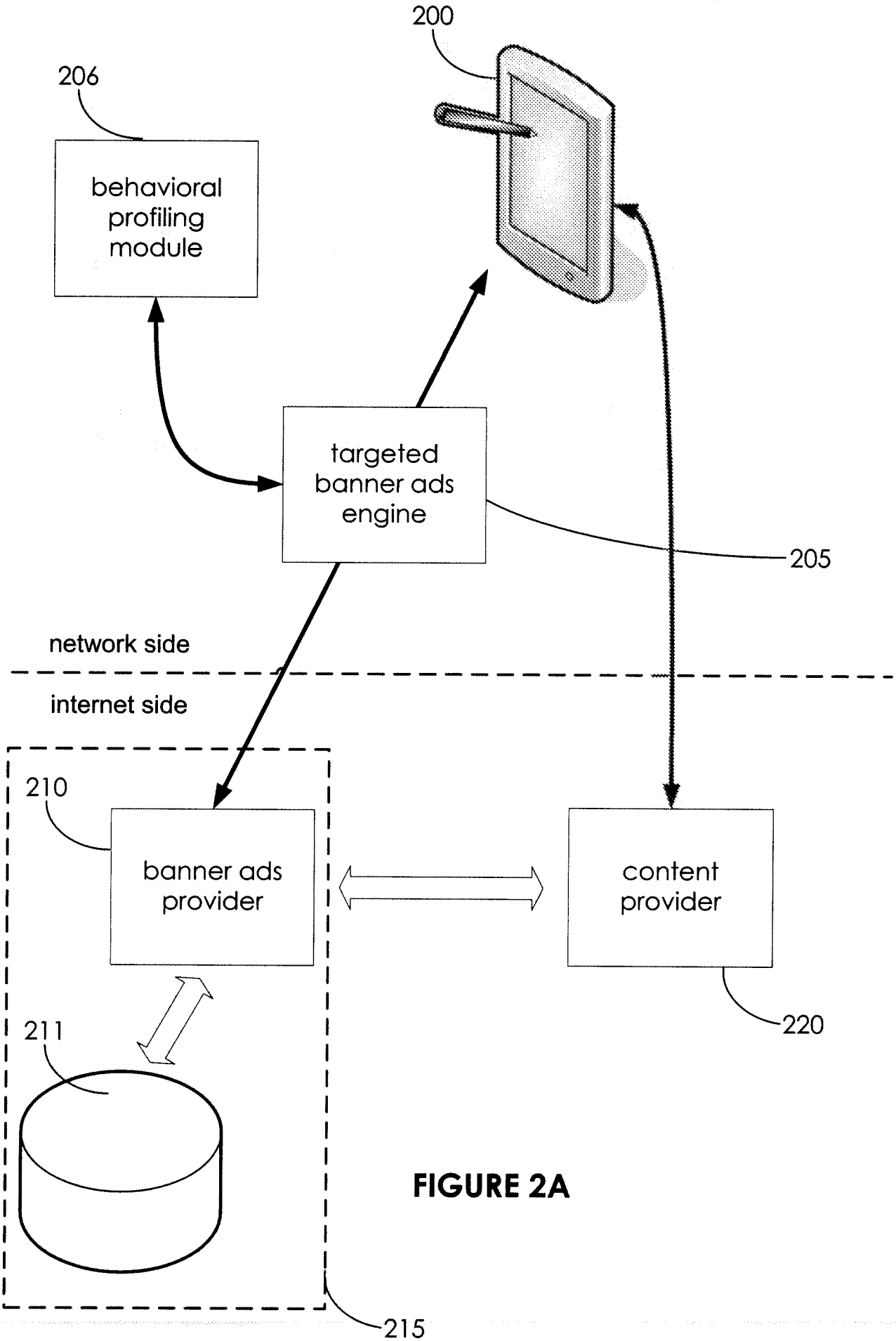
200
206
behavioral profiling module
targeted banner ads engine
205
network side
internet side
210
banner ads provider
content provider
220
211
215

FIGURE 2A

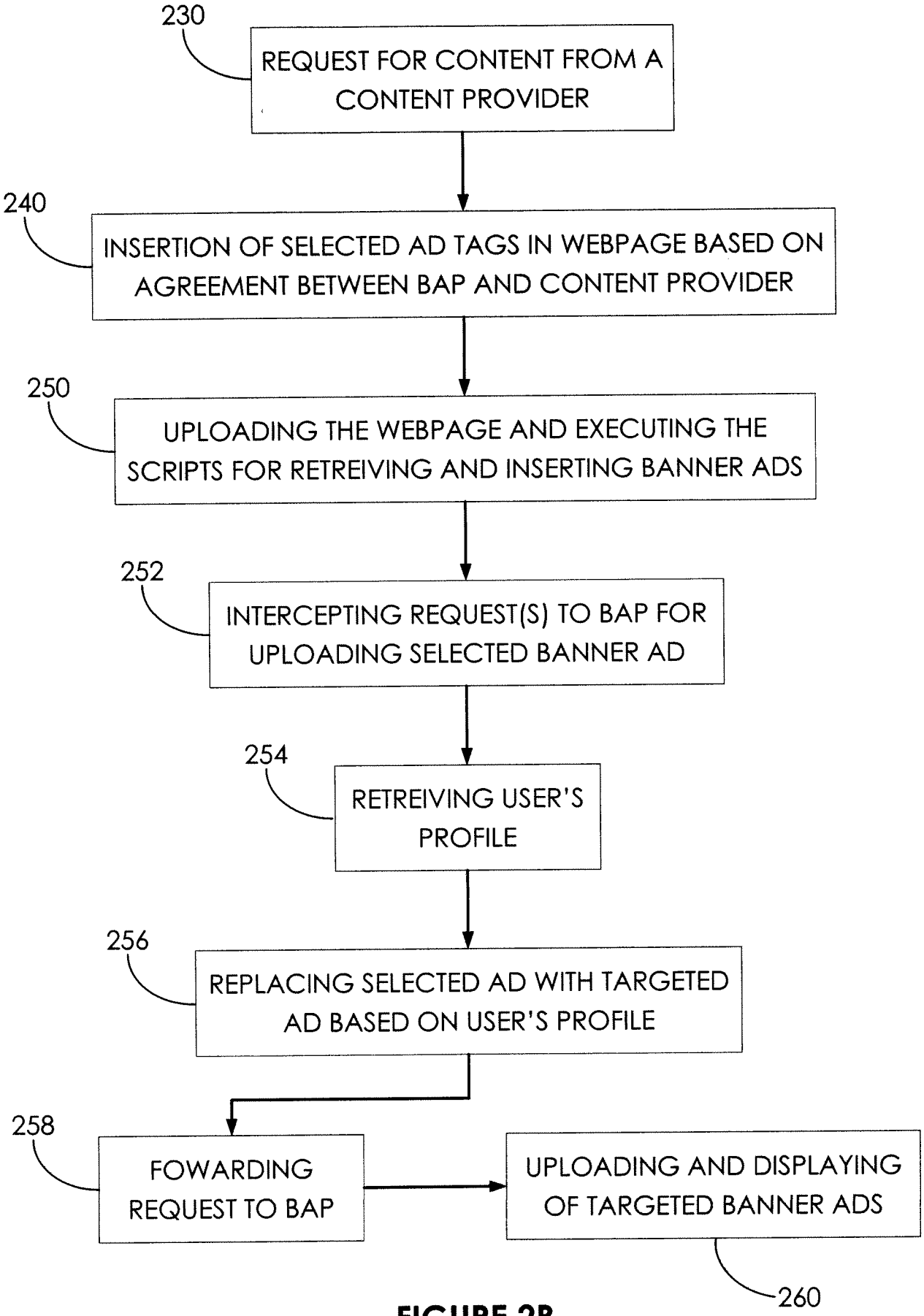
230
REQUEST FOR CONTENT FROM A CONTENT PROVIDER
240
INSERTION OF SELECTED AD TAGS IN WEBPAGE BASED ON AGREEMENT BETWEEN BAP AND CONTENT PROVIDER
250
UPLOADING THE WEBPAGE AND EXECUTING THE SCRIPTS FOR RETREIVING AND INSERTING BANNER ADS
252
INTERCEPTING REQUEST(S) TO BAP FOR UPLOADING SELECTED BANNER AD
254
RETREIVING USER'S PROFILE
256
REPLACING SELECTED AD WITH TARGETED AD BASED ON USER'S PROFILE
258
FOWARDING REQUEST TO BAP
UPLOADING AND DISPLAYING OF TARGETED BANNER ADS
260

FIGURE 2B

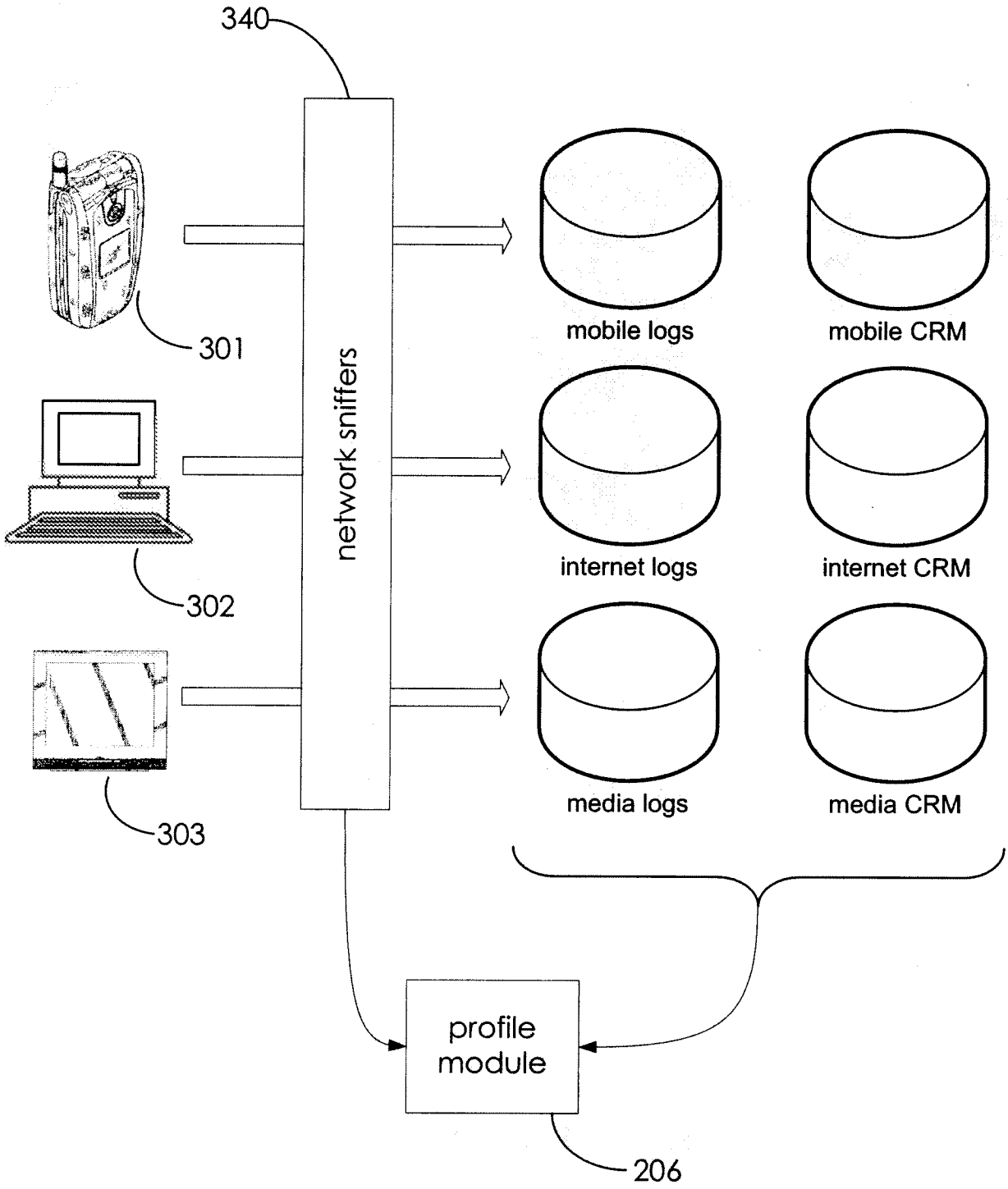
340
network sniffers
301
302
303
mobile logs
mobile CRM
internet logs
internet CRM
media logs
media CRM
profile module
206

FIGURE 3

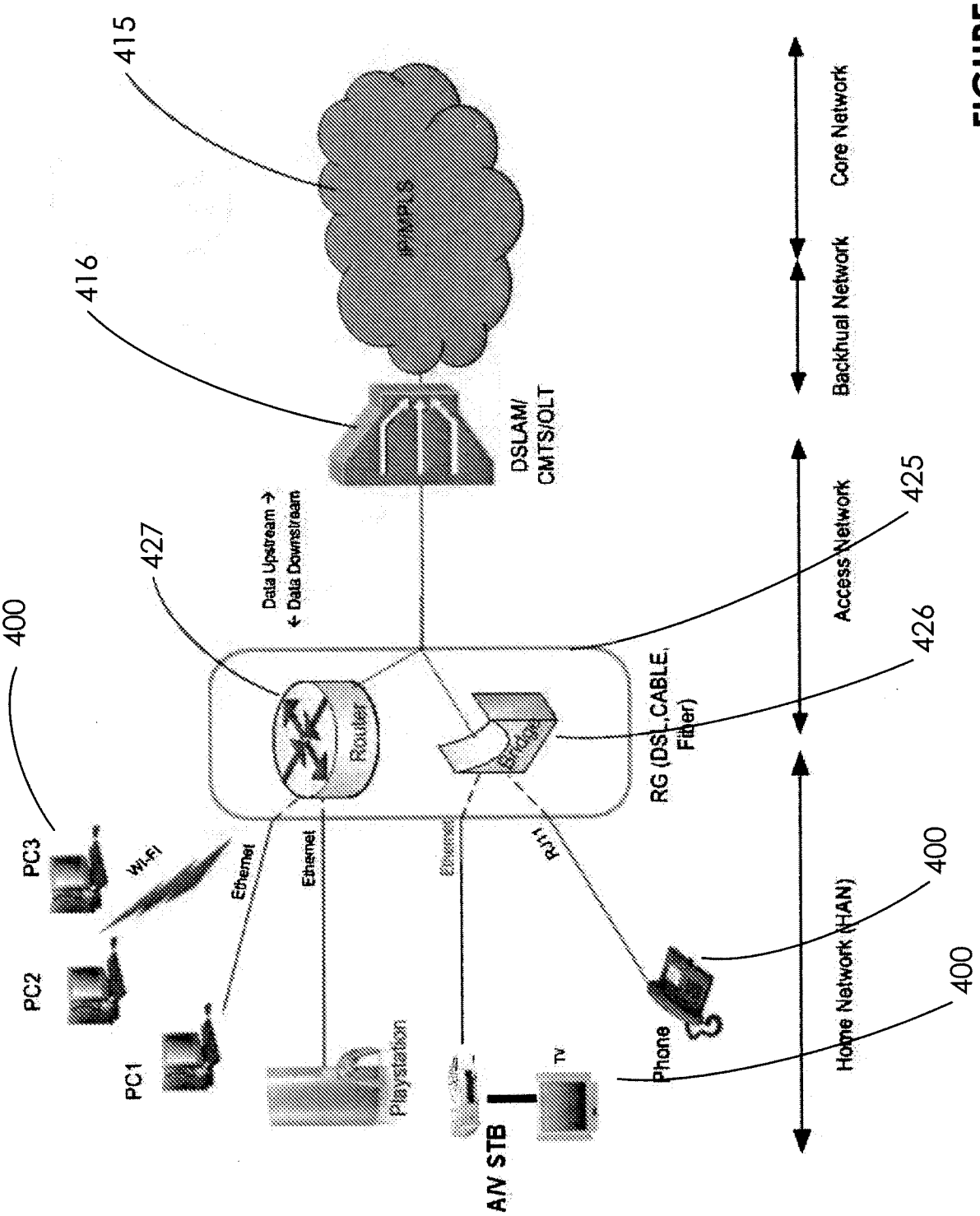
415
416
IP/MPLS
DSLAM/
CMTS/OLT
Data Upstream →
← Data Downstream
427
400
PC3
Wi-Fi
Ethernet
PC2
PC1
Router
Bridge
Ethernet
Ethernet
RJ11
RG (DSL,CABLE,
Fiber)
Access Network
425
426
Backhual Network
Core Network
Playstation
A/V STB
TV
Phone
Home Network (HAN)
400
400

FIGURE 4A

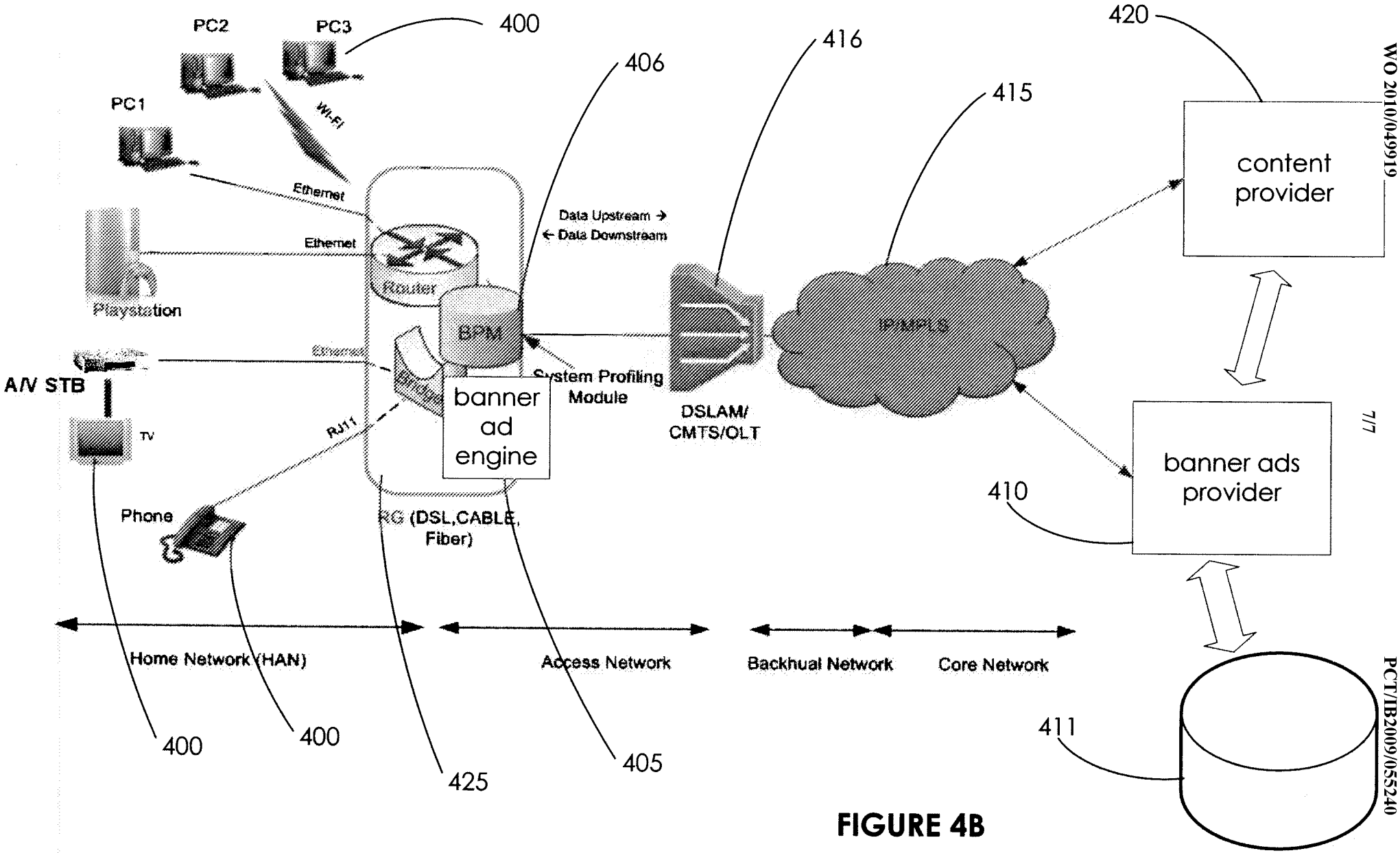

FIGURE 4B

WO 2010/049919 PCT/IB2009/055240

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2009/055240

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06Q30/00

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)
G06Q

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/040225 A1 (ROKER ROBERT [CA]) 14 February 2008 (2008-02-14) abstract paragraph [0023] - paragraph [0025] paragraph [0041] - paragraph [0052] paragraphs [0065], [0077] - paragraph [0079] paragraph [0087] - paragraphs [0089], [0098] paragraph [0100] - paragraph [0107]	1-10
X	US 6 339 761 B1 (COTTINGHAM HUGH V [US]) 15 January 2002 (2002-01-15) column 1, line 54 - last line; figures 1,3 column 2, line 21 - line 31 column 5, line 1 - line 22 column 5, line 33 - line 48 column 6, line 35 - line 59	1-10

-/--

[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
25 February 2010	05/03/2010

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, Fax: (+31-70) 340-3016	Tiago Pinheiro

INTERNATIONAL SEARCH REPORT

International application No
PCT/IB2009/055240

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006/099583 A2 (121 MEDIA INC [GB]; ERTUGRUL KENT [GB]; ROSLOV ANTON [GB]) 21 September 2006 (2006-09-21) page 3, line 17 - page 4, line 20 page 7, line 1 - line 14 page 9, line 1 - page 11, line 9 page 12, line 4 - page 16, line 1	1-10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2009/055240

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008040225 A1	14-02-2008	US 2008040226 A1	14-02-2008
US 6339761 B1	15-01-2002	NONE	
WO 2006099583 A2	21-09-2006	NONE	