



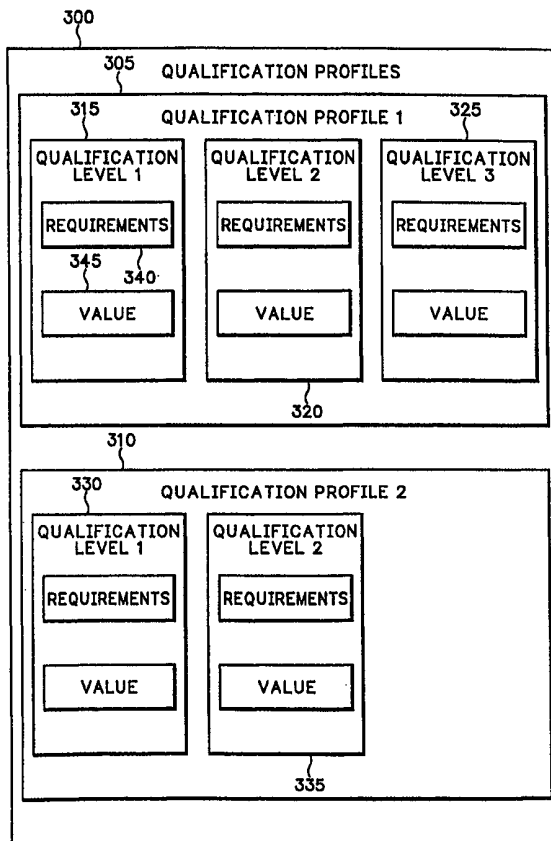
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification <sup>7</sup> : <b>G06F 11/00, 13/00, 13/14, 17/60</b></p>	<p><b>A1</b></p>	<p>(11) International Publication Number: <b>WO 00/45264</b>  (43) International Publication Date: 3 August 2000 (03.08.00)</p>
<p>(21) International Application Number: PCT/US00/01820 (22) International Filing Date: 25 January 2000 (25.01.00)  (30) Priority Data: 09/240,208 29 January 1999 (29.01.99) US  (71) Applicant: WEBTRENDS CORPORATION [US/US]; Suite 1200, 651 S.W. 6th Street, Portland, OR 97204 (US).  (72) Inventors: BOYD, William, Glen; 4321 N.E. Couch, Portland, OR 97213 (US). SHAPIRA, Elijah; 2434 N.W. Pinnacle Drive, Portland, OR 97229 (US). MONTGOMERY, David, S.; 2030 N.W. Willow Drive, Camas, WA 98607 (US).  (74) Agents: MCCOLLOM, Alan, T. et al.; Marger Johnson &amp; McCollom, PC, 1030 S.W. Morrison Street, Portland, OR 97205 (US).</p>	<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p><b>Published</b> <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p>	

(54) Title: METHOD AND APPARATUS FOR EVALUATING VISITORS TO A WEB SERVER

(57) Abstract

Different web pages on a web server are associated with different qualification profiles (305), each of which is assigned a value (340) by the web-site proprietor. Traffic data hits at the web-site are analyzed to determine which web pages the visitor viewed on the web server. Each qualifying visitor is thereafter associated with a qualification profile (305) and a corresponding value (340). In another aspect of the invention, visitors arriving as a result of an advertisement on a remote web-site are tracked. The web-site proprietor is consequently able to determine a return on advertising investment based on the value of visitors brought to the site by the tracked advertisement.



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**METHOD AND APPARATUS FOR EVALUATING VISITORS TO A WEB SERVER****BACKGROUND OF THE INVENTION**

The present invention relates generally to web-server traffic data analysis and more particularly to a system and method for determining the value of visitors to a web site.

The worldwide web (hereinafter "web") is rapidly becoming one of the most important publishing mediums today. The reason is simple: web servers interconnected via the Internet provide access to a potentially worldwide audience with a minimal investment in time and resources in building a web site. The web server makes available for retrieval and posting a wide range of media in a variety of formats, including audio, video and traditional text and graphics. And the ease of creating a web site makes reaching this worldwide audience a reality for all types of visitors, from corporations, to startup companies, to organizations and individuals.

This recent growth of the Internet over the past few years has opened new markets for business. Individuals use the Internet for everything from buying new cars to ordering a pizza to hiring a plumber. The ease with which people can use the Internet for such activities has spurred businesses to offer the services and products people desire on the Internet.

Unlike other forms of media, a web site is interactive, and the web server can passively gather access information about each visitor by observing and logging the traffic data exchanged between the web server and the visitor. Important facts about the visitors can be determined directly or inferentially by analyzing the traffic data and the context of the "hit." Moreover, traffic data collected over a period of time can yield statistical information, such as the number of visitors visiting the site each day, what countries, states or cities the visitors connect from, and the most active day or hour of the week. Such statistical information is useful in tailoring marketing or managerial strategies to better match the apparent needs of the audience. Each hit is also encoded with the date and time of the access.

Visitors to a web site are not of uniform interest to the site operator. For example, a relatively low quality visitor might be one that merely reads the home page of the site and moves on. A higher quality visitor might be one that locates, e.g., a product description page, and an even higher quality visitor might be one who visits the price page. The highest quality visitor is, of course, one that orders and pays for goods or services offered by the web site.

Visitors may be induced to visit a web site via advertisements placed on remote web sites. One common way to advertise on the Internet is with banner ads. A banner ad shows a picture or statement of a business's products and services and allows a visitor to click on the ad to visit the web site hosted by the business. The visit may be to obtain more information, or, as is hoped by the business, to effect a purchase of a product or service via the web site.

The problem with Internet advertising is measuring its effectiveness. Internet advertising campaigns vary in price, depending on several factors such as where the ad is to be placed and the expected viewing population. One advertising campaign might cost a business, for example, \$1,000.00 to be on display for one month at one site, whereas the same ad might cost only \$500.00 at another site. Further, it has been difficult to determine exactly how many visitors an advertising campaign generated. In the above example, the \$500.00 advertising campaign might have generated 10,000 visits in the month the ad was up, whereas the \$1,000.00 advertising campaign might have generated only 7,000 visits a month. Finally, the value an advertising campaign generates is a function of what happens after the visitors visit the site. In the above example, although the \$500.00 advertising campaign generated more hits, if none of those visitors made any purchase of the business's products or services, their collective value would be close to \$0.00. On the other hand, although the \$1,000.00 advertising campaign generated fewer hits, those visitors might all have purchased products or services, making their collective value at least several hundreds of thousands of dollars. It is this difficulty in gauging the effectiveness of advertising campaigns that makes their use a gamble. Accordingly, there remains a need for a way to analyze the effectiveness of advertising campaigns to determine their relative worth.

It would be desirable to analyze the information gathered by the web server to determine the quality of visitors to the web site.

It would also be desirable for the site operator to use the determined visitor quality to analyze the effectiveness of the operator's advertising.

#### SUMMARY OF THE INVENTION

A business owner indicates what advertising campaigns that are run for the web site of interest. The business owner also constructs profiles that define products or services the business owner wants to sell, and assigns each profile a value. The software then analyzes the web site's log files (which track every exchange of traffic data between the web site and

other computers over the Internet) and matches visitors with both an advertising campaign and a profile. Finally, the software sums the value for each visitor matched with an advertising campaign according to the profiles with which the visitor is matched.

One object of the present invention is to allow an Internet business owner a way to  
5 track the value of visitors who visit the web site.

Another object of the present invention is to allow an Internet business owner a way to calculate the return on investment for each advertising campaign the business owner is currently running.

The foregoing and other objects, features, and advantages of the present invention will  
10 become more readily apparent from the following detailed description of a preferred embodiment that proceeds with reference to the drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows the communication between a remote visitor, a first web site, and a  
15 second web site, where the second web site refers the visitor to the first web site.

Fig. 2 shows a prior art format used in recording a "hit" of traffic data received by the server of Fig. 1.

Figs. 3 and 4 illustrate hits memorialized in the log file of the server in Fig. 1.

Figs. 5 and 6 show an embodiment for data structures that store qualification profiles  
20 and advertising campaigns.

Fig. 7 shows a flow diagram for processing records of traffic data hits and calculating the return on investment for advertising campaigns in a first embodiment of the invention.

Fig. 8 shows a flow diagram for assigning a traffic data hit to a visitor session in the first embodiment.

Fig. 9 shows a flow diagram for assigning visitor sessions to qualification profiles  
25 based on the visitor's activity in the first embodiment.

Fig. 10 is a second embodiment that shows a flow diagram for processing traffic records offline from a data source, such as a log file, evaluating the traffic, and correlating the value to any corresponding ad campaigns.

Fig. 11 shows a flow diagram for closing and accumulating visitor sessions in the  
30 second embodiment.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Fig. 1 is a functional block diagram of a prior art system for analyzing traffic data in a distributed computing environment 9. It is more fully described in "WebTrends Installation and Visitor Guide," version 2.2, October 1996, and in U.S. Patent Application No.

5 08/801,707, filed on February 14, 1997, the disclosures of which are incorporated herein by reference for all purposes. WebTrends is a trademark of WebTrends Corporation, Portland, Oregon.

A first server 10 provides web site and related services to remote visitors. By way of example, the remote visitors can access the server 10 from a remote computer system 12  
10 interconnected with the server 10 over a network connection 13, such as the Internet or an intranet, a dial up (or point-to-point) connection 14 or a direct (dedicated) connection 17. Other types of remote access connections are also possible.

Each request by a remote visitor to the server 10 – and the reply thereto – comprises a "hit" of raw traffic data 11. The format used in recording each traffic data hit 11 and an  
15 example of a traffic data hit 11 are described below with reference to Figs. 2-4. The server 10 preferably stores each traffic data hit 11 in a log file 15, although a database 16 or other storage structure can be used. The present invention can be implemented using any source of traffic data hits.

The present embodiment of the invention is implemented in part via a computer  
20 program run on server 10. It should be appreciated, however, that the invention could be implemented as well by a program operating on a different computer, such as a work station connected to server 10 or a computer connected to server 10 via an intranet or other network. As will shortly be seen, the computer implementing the invention need not even be connected to the server; it is necessary only that the traffic data hits generated by the server be  
25 accessible by the computer implementing the invention. For example, the computer implementing the invention could monitor and process the traffic directly with network connection 13.

Five sources of traffic data hits 11 (remote system or visitor 12, dial-up connection 14, log file 15, database 16 and direct connection 17) are shown. Other sources are also  
30 possible. The traffic data hits 11 can originate from any single source or from a combination of these sources. The program examines each traffic data hit 11 and analyzes the access information obtained from the traffic data in a manner later described in more detail.

In the described embodiment, the server 10 is typically an Intel Pentium-based computer system equipped with a processor, memory, input/output interfaces, a network interface, a secondary storage device and a user interface, preferably such as a keyboard and display. The server 10 typically operates under the control of either the Microsoft Windows NT or Unix operating systems and executes either Microsoft Internet Information Server or NetScape Communications Server software. Pentium, Microsoft, Windows, Windows NT, Unix, Netscape and Netscape Communications Server are trademarks of their respective owners. However, other server 10 configurations varying in hardware, such as DOS-compatible, Apple Macintosh, Sun Workstation and other platforms, in operating systems, such as MS-DOS, Unix and others, and in web software are also possible. Apple, Macintosh, Sun and MS-DOS are trademarks of their respective owners.

A second server 8 also provides web site and related services to remote visitors such as visitor 12. It is constructed and operates in substantially the same manner as first server 10 and can be accessed in the same fashion.

The present invention is preferably implemented as a computer program executed by the server 10 and embodied in a storage medium comprising computer-readable code. In the described embodiment, the program is written in the C programming language, although other programming languages are equally suitable. It operates in a Microsoft Windows environment and can analyze Common Log File, Combined Log File and proprietary log file formats from industry standard web servers, such as those licensed by NetScape, NCSA, O'Reilly WebSite, Quarterdeck, C-Builder, Microsoft, Oracle, EMWAC, and other Windows 3.x, Windows NT 95, Unix and Macintosh Web servers.

Fig. 2 shows a format used in storing a "hit" of raw traffic data 11 received by the server of Fig. 1. A raw traffic data hit 11 is not in the format shown in Fig. 2. Rather, the contents of each field in the format is determined from the data exchanged between the server 10 and the source of the traffic data hit 11 and the information pulled from the data is stored into a data hit using the format of Fig. 2 prior to being stored in the log file 15 (shown in Fig. 1) or processed.

Each traffic data hit 11 is a formatted string of ASCII data. The format is based on the standard log file format developed by the National Center for Supercomputing Applications (NCSA), the standard logging format used by most web servers. The format consists of seven fields as follows:

<u>Field Name</u>	<u>Description</u>
Visitor Address (30):	Internet protocol (IP) address or domain name of the visitor accessing the site.
5 RFC931 (31):	Obsolete field usually left blank, but increasingly used by many web servers to store the host domain name for multi-homed log files.
Visitor Authentication (32):	Exchanges the visitor name if required for access to the web site.
10 Date/Time (33):	Date and time of the access and the time offset from GMT.
Request (34):	Either GET (a page request) or POST (a form submission) command.
Return Code (35):	Return status of the request which specifies whether the transfer was successful.
15 Transfer Size (36):	Number of bytes transferred for the file request, that is, the file size.

In addition, three optional fields can be employed as follows:

<u>Field Name</u>	<u>Description</u>
20 Referring URL (37):	URL used to obtain web site information for performing the "hit."
Agent (38):	Browser version, including make, model or version number and operating system.
25 Cookie (39):	Unique identifier permissively used to identify a particular visitor.

Other formats of traffic data hits 11 are also possible, including proprietary formats containing additional fields, such as time to transmit, type of service operation and others.

30 Moreover, modifications and additions to the formats of raw traffic data hits 11 are constantly occurring and the extensions required by the present invention to handle such variations of the formats would be known to one skilled in the art.

In operation, remote visitor 12, whose Internet address might be *visitor.sample.org*, clicks on a link to request a web page from the second web server 8, whose Internet address  
 35 might be *www.portal.com*. (Another name for a web page address in Internet parlance is Universal Resource Locator, or URL.) This click generates a traffic data hit consisting of a reply. In this case, the traffic data hit is a request for the second web server 8 to provide to the remote visitor 12 the web page *http://www.portal.com/somepage.htm*. Since the remote visitor 12 generated the request, the traffic data hit is a "GET" command. Upon receiving the  
 40 traffic data hit, the second web server 8 sends a reply back to the remote visitor 12 consisting



of an “OK” message and the requested web page. The computer of visitor 12 then displays the requested web page *http://www.portal.com/somepage.htm* on the remote visitor’s 12 browser.

Somewhere on the provided web page might be an advertisement for the first web server, whose Internet address is *www.example.com*. This advertisement is an advertising  
5 campaign run by the first web server 10. If the remote visitor is interested in finding out more about the products or services advertised, she might then click on the advertisement, which includes a link that redirects the visitor to the first web server 10. This generates a second request for a web page. This request is directed to the first web server 10. By  
10 clicking on the advertisement, the visitor requests the first web server 10 to provide the web page *http://www.example.com/portal\_ad.htm* via a second traffic data hit 11a, shown in Fig. 3. It should be clear that the requested web page *http://www.example.com/portal\_ad.htm* in traffic data hit 11a is on the first web server 10, and not on the second web server 8. Upon receiving the traffic data hit 11a requesting web page  
15 *http://www.example.com/portal\_ad.htm*, the first web server 10 sends data back to the remote visitor 12 containing an “OK” message and the requested web page. The first web server also writes an entry in its log file memorializing the request for web page  
*http://www.example.com/portal\_ad.htm*. This entry 11a stores several important pieces of information. Entry 11a stores the remote visitor’s Internet address (visitor.sample.org), the  
20 time and date of the request ([12/Jan/1996:20:37:55 +0000], or January 12, 1996, at 8:37:55 PM, Greenwich Mean Time), the request issued by the remote visitor 12 (“GET /portal\_ad.htm HTTP/1.0”), and the referring URL (*http://www.portal.com/somepage.htm*). (Note that, although it is not shown, the second web server 8 can also create its own log file entries similar to those of log file 15.)

25 After being referred to server 10 as described above, remote visitor 12 visits several pages on server 10. In Fig. 4, hits are depicted that represent visits by the remote visitor, whose Internet address is visitor.sample.org, to these pages on server 10. The remote visitor 12 first generates a traffic data hit 11b, requesting the web page *default.htm*. When the web server 10 receives the traffic data hit 11b, the web server replies by sending data containing a  
30 response message, along with the requested web page *default.htm*. The web server also writes entry 11b into its log file 15. The log file entry 11b indicates remote visitor’s 12 request for the web page *default.htm*.

A little while later, the remote visitor 12 requests web page products.htm in traffic data hit 11c. The web server 10 receives the traffic data hit 11c and sends back data containing a response message and the requested web page *products.htm*. The web server 10 also writes another entry 11c into the log file 15. This log file entry 11c indicates the remote visitor's request for the web page products.htm.

Fig. 5 shows an embodiment for the qualification profiles. Generally speaking, a qualification profile comprises predetermined activity at a web site. It is used to correlate a pattern of activity with a value. The pattern of activity could indicate a level of interest in a product or service offered at the web site. In Fig. 5, the qualification profile data structure 300 is shown holding two qualification profiles 305 and 310; however, the invention can be implemented with any number of qualification profiles. The names for the qualification profiles are assigned by the site operator, and may be more meaningful than the arbitrary names *Qualification profile 1* and *Qualification profile 2* used here. For example, they might be the names of different products or classes of products offered for sale by the operator of the site on server 10. Qualification profile 305 includes three qualification levels 315, 320, and 325; qualification profile 310 includes two qualification levels 330 and 335. Each qualification level represents a different level of interest in the product or service represented by the qualification profile. Although the preferred embodiment has three qualification levels – fully qualified, moderately qualified, and minimally qualified – the invention may be implemented with any number, and as shown in Fig. 5, different qualification profiles can have different numbers of qualification levels.

As each qualification level includes the same type of information, only qualification level 315 will be discussed in greater detail, although Fig. 5 shows the detail for the other qualification levels 320, 325, 330, and 335. Qualification level 315 includes two elements: a set of requirements 340 (or entry criteria) a visitor must meet to qualify for the qualification level in that qualification profile, and a quantitative value 345 to assign to each visitor who qualifies for that qualification level. It should be appreciated that the value associated with a qualification level need not be quantitative: it may simply be inherent in the requirements of the qualification level.

The set of requirements 340 a visitor must meet to qualify for that qualification level in that qualification profile are very flexible. First, in the preferred embodiment, the sets of requirements 340 do not have to be related in any way. For example, it is not required that

the set of requirements for qualification level 315 be a proper subset of the set of requirements for qualification level 325.

In the preferred embodiment, the sets of requirements 340 can be tied to web pages (or URLs) a visitor must visit. Requirements 340 could also be tied to the elapsed time the visitor spends at the site or on a particular page or group of pages, or to information submitted by a visitor in a form located on one of the web pages. Another example of requirements 340 includes visiting a content group, which is simply a collection of pages or a class of URLs. In addition, one of requirements 340 could be a return visit by a visitor. It should be appreciated that the site operator provides such information as the name of the qualification profiles 305 and 310, the chosen qualification levels 315, 320, 325, 330, and 335, the sets of requirements 340, and the qualitative value 345 to assign to each visitor who qualifies for the qualification level in that qualification profile.

Not shown in Fig. 5 is the nonqualified visitor value that is assigned to each visitor who does not qualify for any qualification profile.

Fig. 6 shows a data structure for the advertising campaigns. In Fig. 6, the advertising campaign data structure 375 is shown holding three advertising campaigns 377, 378, and 379; however, there is no requirement that there be any particular number of advertising campaigns. The names for the advertising campaigns are assigned by the site operator, and may be more meaningful than the arbitrary names *Advertising Campaign 1*, *Advertising Campaign 2*, and *Advertising Campaign 3* used here. For example, in the case of tracking banner advertisements that refer visitors from other web sites, the name of the referring site might be used. As each advertising campaign includes the same type of information, only advertising campaign 377 will be discussed in greater detail, although Fig. 6 shows the detail for the other advertising campaigns 378 and 379. Advertising campaign 377 includes five elements: an entry page 380 (an entry page is the first hit in a visitor session: in Fig. 1, the web page *http://www.example.com/portal\_ad.htm* is the entry page), a referrer 383 (a referrer is a web page that links a visitor to the advertised web site: in Fig. 1, the web page *http://www.portal.com/somepage.htm* is the referrer), a start date 386 for the advertising campaign, an end date 389 for the advertising campaign, and a cost 392 for the advertising campaign during the period from the start date 386 to the end date 389. The entry page 380 and the referrer 383 help the program associate each visitor with an advertising campaign. To make it possible to distinguish between advertising campaigns, entry pages 380 and

referrers 383 should be unique. Although not required, in the preferred embodiment the entry page 380 and the referrer 383 are mutually exclusive elements: the operator can assign only one of the two, and the other remains blank.

Fig. 7 illustrates a first embodiment of the invention. In Fig. 7, at step 700, a data source, such as a log file, is opened for reading. At step 705, the program checks to see if there are any hits left in the log file for processing. If there are, the next hit is read from the log file at step 710. At step 715, the current hit is assigned to a visitor session, described with reference to Fig. 8.

Turning to Fig. 8, in step 500, the hit is analyzed to determine the address of the visitor who generated the hit. This information is easily determined, as the structure of the hit is well documented, as described above and depicted in Figs. 2-4.

Still looking at Fig. 8, once the current hit's visitor address has been determined, at step 505 the program scans the visitor session database. A *visitor session* is a sequence of hits received from a single visitor. The sequence extends between the first hit until a

predetermined time after the most recent hit has lapsed without further hits. Although the term *visitor* was used to describe the qualification profiles and ad campaigns with reference to Figs. 5 and 6, the program in fact tracks *visitor sessions*. Each visitor session, of course, is associated with a single visitor. All visitor sessions are maintained in a database. At step 510

the program checks to see if the visitor address exists in the visitor session database. If the visitor address is new to the visitor session database, then at step 515 a new entry to the visitor session database is created, using the information from the hit (which includes what, if any, advertising campaign the visitor followed, discussed below). If the visitor address already existed at step 510, then at step 520 the date and time of the current hit are

determined. At step 525 the program checks to see how long it has been since the visitor's last activity, i.e., since the last hit was received from that visitor. If it has been longer than the predetermined session time, then the session for that visitor is concluded. When the same

visitor revisits the site after their session was concluded, then step 515 is performed and a new visitor record in the visitor database is created. But if the visitor session is still active,

i.e., the predetermined time from the last hit has not lapsed when the next hit arrives, step 530

is performed and the visitor database is updated according to the current hit. This includes updating the visitor's last date and time of activity and updating the list of actions the visitor has performed.

After completion of the routine of Fig. 8, control then returns to step 705 in Fig. 7 to process additional hits as described above. If, however, there are no hits left in the log file for processing at step 705, control moves to step 720, where the program checks to see if there are any visitor sessions that need to be assigned to qualification profiles. If there are  
5 visitor sessions left to process, then step 725 reads the history for one of the remaining visitor sessions. Step 730, in a routine depicted in Fig. 9, then assigns the current visitor session to all qualification profiles for which it qualifies.

Referring to Fig. 9, at step 600, the complete history of the visitor session to which the current hit was assigned is read.

10 There are currently two ways that the program can identify which particular advertising campaign a visitor followed to the site. One is by referrer. A referrer is the web page that held the link the visitor followed to reach the web site. For example, referring back to Figs. 1-4, the referrer is the web page *http://www.portal.com/somepage.html*, which referred the remote visitor 12 to the first web site 10, *www.example.com*.

15 The second way the program can identify which particular advertising campaign a visitor followed to the site is by the entry page. The entry page is the first web page on server 10 visited; in the case of advertising campaigns, each advertising campaign can have a different entry page (all of which differ from the entry page used by visitors who are not following an advertising campaign). For example, referring to Fig. 3, the entry page on  
20 server 10 is the web page *http://www.example.com/portal\_ad.htm*.

Regardless of the method the advertising campaign uses to determine what advertisement a visitor followed, if any, that information is available from the first hit a visitor generates at the web site. Referring back to Fig. 3, entry 11a shows both the requested page (“GET /portal\_ad.htm HTTP/1.0”) and the referring site  
25 (“http://www.portal.com/somepage.htm”). Thus, the program uses the first hit a visitor generates to determine what advertising campaign they followed. The entry page and referrer is assigned in step 601, and —based on this data—the ad campaign is assigned in step 603.

At step 605 the first qualification profile is read. Again, there is no concern of trying to read a non-existent object: if no qualification profiles exist, the program will not be used,  
30 since no analysis is needed. At step 610 the visitor session history (read at step 600) is compared with the requirements of the qualification levels of the current qualification profile (read at step 605). At step 615, the program checks to see if the visitor session has met all the

requirements for any of the qualification levels of the current qualification profile. If it has, then at step 620 the visitor session is added to the appropriate qualification levels of the current qualification profile. Note that, in the preferred embodiment, within each qualification profile, the qualification levels are ranked, and a visitor session is added to the highest-ranking qualification level of each qualification profile for which the visitor session meets the requirements, but this limitation is not always necessary. (The preferred embodiment also ranks qualification levels: the visitor is added to the highest ranked qualification level -- within each qualification profile -- for which the visitor qualifies.) At step 625, whether or not the visitor session met the requirements for any of the qualification levels of the current qualification profile, the program checks to see if there are any more qualification profiles defined. If there are, then at step 630 the next qualification profile is read and control returns to step 610. Otherwise, the processing of the current hit is finished, and control reverts to step 720 in Fig. 7.

If there are remaining visitor sessions to process, the Fig. 7 routine does so in steps 725 and 730 as described above. Conversely, if there are no remaining visitor sessions left to process at step 720, control is transferred to step 735, where the return-on-investment (ROI) analysis is performed.

Before describing the ROI analysis consideration will first be given to the raw data and its format that exists after the routines of Figs. 7-9 are run as described above. For each ad campaign, the number of visitor sessions that met each level of each qualification profile is stored in tables, as depicted in the Table A example:

	QP1			QP2			
	L1	L2	L3	L1	L2	NQ	
ADC1	4	6	7	3	5	35	
ADC2	5	9	12	6	11	63	
ADC3	1	0	2	3	4	20	
NADC	21	35	46	28	39	211	

QPn - Qualification Profile n  
 ADCn - Ad Campaign n  
 NQ - Not qualified for any QP  
 NADC - No Ad Campaign  
 Ln - Qualification Level n

Table A

Those visitor sessions that do not result from an ad campaign that is being monitored are classified in the No-Ad-Campaign category. Those visitor sessions that do not meet the criteria of any of the Qualification Profiles are categorized in the NQ column. For each referrer, the number of visitor sessions that met each qualification profile is stored in tables, as depicted in the Table B example:

	QP1			QP2		NQ
	L1	L2	L3	L1	L2	
R1	2	7	4	2	6	25
R2	4	2	16	2	11	83
R3	2	3	7	0	0	10
NR	31	32	43	22	31	124

Rn - Referrer n  
 NR - No Referrer

Table B

Those visitor sessions that have no referrer are classified in the No-Referrer category. One instance in which a visitor session has no referrer arises when a visitor types in the monitored web-site address (typically a home page URL) and goes directly to the web site. All visitor sessions that do have a referrer are associated with the referrer. In other words, all referrers are tracked. When a new referrer is encountered, a new entry in the table is made.

The ROI analysis uses the following raw data: Tables A and B; the period of the report, which is the time of the first to the last records processed; the qualification profiles (Fig. 5); the ad campaigns (Fig. 6); and the nonqualified visitor value assigned to the visitor sessions that wind up in the NQ category.

Tables 1-9 below show sample output tables that can be generated by ROI analysis. These tables cross-correlate information from the raw data in various ways. For example, Table 1 shows the number of visitors referred to the web server from six different referring URLs, along with the value of the visitors referred. For each referrer, the number of visitor sessions is shown, as well as the total visitor sessions for all referrers. For each referrers, the value of the visitor sessions for each qualification level is calculated by multiplying the value from that level (Fig. 5) times the visitor sessions meeting the criteria for the qualification profile. Total value of the visitor sessions for all referrers is the sum of these products.

Various additional variables can be calculated using the raw data, and displayed in tables, additional tables, like Tables 2-9 below. Although each calculation is not described, the manner of using the raw data to generate each of the calculated variables in the tables can be easily inferred from the name of the variable in view of the following brief description of the table

Table 2 shows the number of visitors in each qualification profile (in this instance downloading of specified products Product 1, Product 2, and Product 3), arranged by qualification level and referring URL. Table 3 shows the number of visitors from each of six advertising campaigns, broken down into qualified and non-qualified visitors, and the values the visitors generate. Although not shown, it should be noted that all untracked visitors, i.e., those not associated with a tracked ad campaign, can be summarized in the same categories as those shown in Table 3 for tracked visitors. Table 4 shows the number of visitors referred from each advertising campaign, sorted by qualification profile and qualification level. Table 5 shows visitors assigned to each qualification profile and the value they generate sorted by advertising campaign. Table 6 shows visitors for each qualification profile and the value they generated, sorted by qualification level and advertising campaign. Table 7 shows the cost of each of the six advertising campaigns and the cost per visitor for each visitor referred from the respective advertising campaigns. Table 8 shows the return on investment from each advertising campaign, where the return on investment is based on the value of the visitors referred from the respective advertising campaigns less the cost of each campaign. Finally, Table 9 shows the daily return on investment shown in Table 8.

**Table 1**

<b>Summary of Results by Referrer</b>			
	<b>Referrer</b>	<b>Visitor Sessions</b>	<b>Value of Visitors Referred</b>
1	http://www.yahoo.com/	1303	\$3,229.50
2	http://www.excite.com/	980	\$2,238.00
3	http://www.builder.com/	900	\$2,511.50
4	http://www.intergreat.com/	605	\$1,540.50
5	http://www.lycos.com/	443	\$1,194.00
6	http://www.hotwired.com/	257	\$652.50
	<b>Total</b>	<b>4488</b>	<b>\$11,366.00</b>



Table 2

Top Referring Sites By Qualification Profile and Qualification Level					
	Qualification Profile	Qualification Level	Referrer	Visitor Sessions	% of Total
1	Product 1	Fully Qualified	http://www.yahoo.com/	24	34.29%
			http://www.builder.com/	21	30.00%
			http://www.excite.com/	9	12.86%
			http://www.intergreat.com/	8	11.43%
			http://www.lycos.com/	6	8.57%
			http://www.hotwired.com/	2	2.86%
			<b>Subtotal</b>	<b>70</b>	<b>100.00%</b>
		Moderately Qualified	http://www.builder.com/	53	34.64%
			http://www.yahoo.com/	41	26.80%
			http://www.excite.com/	20	13.07%
			http://www.lycos.com/	18	11.76%
			http://www.intergreat.com/	12	7.84%
			http://www.hotwired.com/	9	5.88%
		<b>Subtotal</b>	<b>153</b>	<b>100.00%</b>	
		Minimally Qualified	http://www.builder.com/	72	30.90%
			http://www.yahoo.com/	60	25.75%
			http://www.intergreat.com/	32	13.73%
			http://www.excite.com/	30	12.88%
			http://www.lycos.com/	22	9.44%
			http://www.hotwired.com/	17	7.30%
		<b>Subtotal</b>	<b>233</b>	<b>100.00%</b>	
<b>Group Subtotal</b>		<b>456</b>	<b>100.00%</b>		
2	Product 2	Fully Qualified	http://www.yahoo.com/	13	34.21%
			http://www.builder.com/	8	21.05%
			http://www.intergreat.com/	6	15.79%
			http://www.excite.com/	5	13.16%
			http://www.lycos.com/	4	10.53%
			http://www.hotwired.com/	2	5.26%
		<b>Subtotal</b>	<b>38</b>	<b>100.00%</b>	
		Moderately Qualified	http://www.lycos.com/	23	31.51%
			http://www.builder.com/	15	20.55%
			http://www.intergreat.com/	14	19.18%
			http://www.yahoo.com/	12	16.44%
			http://www.excite.com/	9	12.33%
			http://www.hotwired.com/	0	0.00%
		<b>Subtotal</b>	<b>73</b>	<b>100.00%</b>	
		Minimally Qualified	http://www.yahoo.com/	32	28.57%
			http://www.builder.com/	23	20.54%
			http://www.intergreat.com/	26	23.21%
			http://www.lycos.com/	15	13.39%
			http://www.excite.com/	10	8.93%
			http://www.hotwired.com/	6	5.36%
		<b>Subtotal</b>	<b>112</b>	<b>100.00%</b>	
<b>Group Subtotal</b>		<b>223</b>	<b>100.00%</b>		
3	Product 3	Fully Qualified	http://www.builder.com/	12	33.33%
			http://www.lycos.com/	9	25.00%
			http://www.intergreat.com/	7	19.44%
			http://www.yahoo.com/	4	11.11%
			http://www.hotwired.com/	3	8.33%
			http://www.excite.com/	1	2.78%

		<b>Subtotal</b>	<b>36</b>	<b>100.00%</b>
Moderately Qualified		http://www.intergreat.com/	19	29.69%
		http://www.builder.com/	15	23.44%
		http://www.lycos.com/	13	20.31%
		http://www.hotwired.com/	11	17.19%
		http://www.yahoo.com/	6	9.38%
		http://www.excite.com/	0	0.00%
		<b>Subtotal</b>	<b>64</b>	<b>100.00%</b>
Minimally Qualified		http://www.builder.com/	28	26.42%
		http://www.intergreat.com/	22	20.75%
		http://www.lycos.com/	21	19.81%
		http://www.hotwired.com/	16	15.09%
		http://www.yahoo.com/	13	12.26%
		http://www.excite.com/	6	5.66%
		<b>Subtotal</b>	<b>106</b>	<b>100.00%</b>
	<b>Group Subtotal</b>		<b>206</b>	<b>100.00%</b>
<b>Total</b>			<b>885</b>	<b>100.00%</b>

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Table 3

Summary of Results by Ad Campaign									
	Ad Campaign	Non-Qualified Visitor Sessions	Non-Qualified Visitor Value	Qualified Visitor Sessions	Qualified Visitor Average Value	Qualified Visitors Total Value	Total Visitor Sessions	Visitor Average Value	Total Visitor Value
1	Yahoo! Banner	1098	\$2,196.00	205	\$5.04	\$1,033.50	1303	\$2.48	\$3,229.50
2	Builder.com Banner	653	\$1,306.00	247	\$4.88	\$1,205.50	900	\$2.79	\$2,511.50
3	Excite Banner	890	\$1,780.00	90	\$5.09	\$458.00	980	\$2.28	\$2,238.00
4	Intergreat Banner	459	\$918.00	146	\$4.26	\$622.50	605	\$2.55	\$1,540.50
5	Lycos Banner	312	\$624.00	131	\$4.35	\$570.00	443	\$2.70	\$1,194.00
6	HotWired WebMonkey Banner	193	\$386.00	64	\$4.16	\$266.50	257	\$2.54	\$652.50
	<b>Total</b>	<b>3605</b>	<b>\$7,210.00</b>	<b>883</b>	<b>\$4.71</b>	<b>\$4,156.00</b>	<b>4488</b>	<b>\$2.53</b>	<b>\$11,366.00</b>

**Table 4**

<b>Results by Ad Campaign, Qualification Profile and Qualification Level</b>								
	<b>Ad Campaign</b>	<b>Qualification Profile</b>	<b>Qualification Level</b>	<b>Visitor Sessions</b>	<b>% of Visitor Sessions</b>	<b>Value</b>		
1	Yahoo! Banner	Product 1	Fully Qualified	24	1.84%	\$192.00		
			Moderately Qualified	41	3.15%	\$246.00		
			Minimally Qualified	60	4.60%	\$300.00		
		Product 2	Fully Qualified	13	1.00%	\$78.00		
			Moderately Qualified	12	0.92%	\$48.00		
			Minimally Qualified	32	2.46%	\$96.00		
		Product 3	Fully Qualified	4	0.31%	\$20.00		
			Moderately Qualified	6	0.46%	\$21.00		
			Minimally Qualified	13	1.00%	\$32.50		
		Non-Qualified		1098	84.27%	\$2,196.00		
		<b>Subtotal</b>			<b>1303</b>	<b>100.00%</b>	<b>\$3,229.50</b>	
		2	Excite Banner	Product 1	Fully Qualified	9	0.92%	\$72.00
					Moderately Qualified	20	2.04%	\$120.00
Minimally Qualified	30				3.06%	\$150.00		
Product 2	Fully Qualified			5	0.51%	\$30.00		
	Moderately Qualified			9	0.92%	\$36.00		
	Minimally Qualified			10	1.02%	\$30.00		
Product 3	Fully Qualified			1	0.10%	\$5.00		
	Moderately Qualified			0	0.00%	\$0.00		
	Minimally Qualified			6	0.61%	\$15.00		
Non-Qualified				890	90.82%	\$1,780.00		
<b>Subtotal</b>					<b>980</b>	<b>100.00%</b>	<b>\$2,238.00</b>	
3	Builder.com Banner			Product 1	Fully Qualified	21	2.33%	\$168.00
					Moderately Qualified	53	5.89%	\$318.00
		Minimally Qualified	72		8.00%	\$360.00		
		Product 2	Fully Qualified	8	0.89%	\$48.00		
			Moderately Qualified	15	1.67%	\$60.00		
			Minimally Qualified	23	2.56%	\$69.00		
		Product 3	Fully Qualified	12	1.33%	\$60.00		
			Moderately Qualified	15	1.67%	\$52.50		
			Minimally Qualified	28	3.11%	\$70.00		
		Non-Qualified		653	72.56%	\$1,306.00		
		<b>Subtotal</b>			<b>900</b>	<b>100.00%</b>	<b>\$2,511.50</b>	
		4	Intergreat Banner	Product 1	Fully Qualified	8	1.32%	\$64.00
					Moderately Qualified	12	1.98%	\$72.00
Minimally Qualified	32				5.29%	\$160.00		
Product 2	Fully Qualified			6	0.99%	\$36.00		
	Moderately Qualified			14	2.31%	\$56.00		
	Minimally Qualified			26	4.30%	\$78.00		
Product 3	Fully Qualified			7	1.16%	\$35.00		
	Moderately Qualified			19	3.14%	\$66.50		
	Minimally Qualified			22	3.64%	\$55.00		
Non-Qualified				459	75.87%	\$918.00		
<b>Subtotal</b>					<b>605</b>	<b>100.00%</b>	<b>\$1,540.50</b>	
5	Lycos Banner			Product 1	Fully Qualified	6	1.35%	\$48.00
					Moderately Qualified	18	4.06%	\$108.00
		Minimally Qualified	22		4.97%	\$110.00		
		Product 2	Fully Qualified	4	0.90%	\$24.00		

		Moderately Qualified	23	5.19%	\$92.00	
		Minimally Qualified	15	3.39%	\$45.00	
	Product 3	Fully Qualified	9	2.03%	\$45.00	
		Moderately Qualified	13	2.93%	\$45.50	
		Minimally Qualified	21	4.74%	\$52.50	
	Non-Qualified		312	70.43%	\$624.00	
	<b>Subtotal</b>		<b>443</b>	<b>100.00%</b>	<b>\$1,194.00</b>	
6	HotWired WebMonkey Banner	Product 1	Fully Qualified	2	0.78%	\$16.00
			Moderately Qualified	9	3.50%	\$54.00
			Minimally Qualified	17	6.61%	\$85.00
		Product 2	Fully Qualified	0	0.00%	\$0.00
			Moderately Qualified	0	0.00%	\$0.00
			Minimally Qualified	6	2.33%	\$18.00
		Product 3	Fully Qualified	3	1.17%	\$15.00
			Moderately Qualified	11	4.28%	\$38.50
			Minimally Qualified	16	6.23%	\$40.00
		Non-Qualified		193	75.10%	\$386.00
		<b>Subtotal</b>		<b>257</b>	<b>100.00%</b>	<b>\$652.50</b>
<b>Total</b>			<b>4488</b>	<b>100.00%</b>	<b>\$11,366.00</b>	

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Table 5

Results by Qualification Profile						
	Qualification Profile	Ad Campaign	Qualified Visitor Sessions	% of Visitor Sessions	Value	% of Value
1	Product 1	Builder.com Banner	146	32.02%	\$846.00	32.01%
		Yahoo! Banner	125	27.41%	\$738.00	27.92%
		Excite Banner	59	12.94%	\$342.00	12.94%
		Intergreat Banner	52	11.40%	\$296.00	11.20%
		Lycos Banner	46	10.09%	\$266.00	10.06%
		HotWired WebMonkey Banner	28	6.14%	\$155.00	5.86%
	<b>Subtotal</b>			<b>456</b>	<b>100.00%</b>	<b>\$2,643.00</b>
2	Product 2	Yahoo! Banner	57	25.79%	\$222.00	26.30%
		Builder.com Banner	46	20.81%	\$177.00	20.97%
		Intergreat Banner	46	20.81%	\$170.00	20.14%
		Lycos Banner	42	19.00%	\$161.00	19.08%
		Excite Banner	24	10.86%	\$96.00	11.37%
	HotWired WebMonkey Banner	6	2.71%	\$18.00	2.13%	
<b>Subtotal</b>			<b>221</b>	<b>100.00%</b>	<b>\$844.00</b>	<b>100.00%</b>
3	Product 3	Builder.com Banner	55	26.70%	\$182.50	27.28%
		Intergreat Banner	48	23.30%	\$156.50	23.39%
		Lycos Banner	43	20.87%	\$143.00	21.38%
		HotWired WebMonkey Banner	30	14.56%	\$93.50	13.98%
		Yahoo! Banner	23	11.17%	\$73.50	10.99%
	Excite Banner	7	3.40%	\$20.00	2.99%	
<b>Subtotal</b>			<b>206</b>	<b>100.00%</b>	<b>\$669.00</b>	<b>100.00%</b>

Table 6

Results by Qualification Profile and Qualification Level							
Qualification Profile	Qualification Level	Ad Campaign	Visitor Sessions	% of Visitor Sessions	Visitor Value	% of Visitor Value	
1	Product 1	Fully Qualified	Yahoo! Banner	24	34.29%	\$192.00	34.29%
			Builder.com Banner	21	30.00%	\$168.00	30.00%
			Excite Banner	9	12.86%	\$72.00	12.86%
			Intergreat Banner	8	11.43%	\$64.00	11.43%
			Lycos Banner	6	8.57%	\$48.00	8.57%
			HotWired WebMonkey Banner	2	2.86%	\$16.00	2.86%
			<b>Subtotal</b>	<b>70</b>	<b>100.00%</b>	<b>\$560.00</b>	<b>100.00%</b>
		Moderately Qualified	Builder.com Banner	53	34.64%	\$318.00	34.64%
			Yahoo! Banner	41	26.80%	\$246.00	26.80%
			Excite Banner	20	13.07%	\$120.00	13.07%
			Lycos Banner	18	11.76%	\$108.00	11.76%
			Intergreat Banner	12	7.84%	\$72.00	7.84%
			HotWired WebMonkey Banner	9	5.88%	\$54.00	5.88%
			<b>Subtotal</b>	<b>153</b>	<b>100.00%</b>	<b>\$918.00</b>	<b>100.00%</b>
		Minimally Qualified	Builder.com Banner	72	30.90%	\$360.00	30.90%
			Yahoo! Banner	60	25.75%	\$300.00	25.75%
			Intergreat Banner	32	13.73%	\$160.00	13.73%
			Excite Banner	30	12.88%	\$150.00	12.88%
			Lycos Banner	22	9.44%	\$110.00	9.44%
			HotWired WebMonkey Banner	17	7.30%	\$85.00	7.30%
			<b>Subtotal</b>	<b>233</b>	<b>100.00%</b>	<b>\$1,165.00</b>	<b>100.00%</b>
		<b>Total</b>		<b>456</b>	<b>-</b>	<b>\$2,643.00</b>	<b>-</b>
		2	Product 2	Fully Qualified	Yahoo! Banner	13	36.11%
Builder.com Banner	8				22.22%	\$48.00	22.22%
Intergreat Banner	6				16.67%	\$36.00	16.67%
Excite Banner	5				13.89%	\$30.00	13.89%
Lycos Banner	4				11.11%	\$24.00	11.11%
HotWired WebMonkey Banner	0				0.00%	\$0.00	0.00%
<b>Subtotal</b>	<b>36</b>				<b>100.00%</b>	<b>\$216.00</b>	<b>100.00%</b>
Moderately Qualified	Lycos Banner			23	31.51%	\$92.00	31.51%
	Builder.com Banner			15	20.55%	\$60.00	20.55%
	Intergreat Banner			14	19.18%	\$56.00	19.18%
	Yahoo! Banner			12	16.44%	\$48.00	16.44%
	Excite Banner			9	12.33%	\$36.00	12.33%
	HotWired WebMonkey Banner			0	0.00%	\$0.00	0.00%
	<b>Subtotal</b>			<b>73</b>	<b>100.00%</b>	<b>\$292.00</b>	<b>100.00%</b>
Minimally Qualified	Yahoo! Banner			32	28.57%	\$96.00	28.57%
	Intergreat Banner			26	23.21%	\$78.00	23.21%
	Builder.com Banner			23	20.54%	\$69.00	20.54%
	Excite Banner			10	8.93%	\$30.00	8.93%
	Lycos Banner			15	13.39%	\$45.00	13.39%
	HotWired WebMonkey Banner			6	5.36%	\$18.00	5.36%
	<b>Subtotal</b>			<b>112</b>	<b>100.00%</b>	<b>\$336.00</b>	<b>100.00%</b>
<b>Total</b>				<b>221</b>	<b>-</b>	<b>\$844.00</b>	<b>-</b>
3	Product 3			Fully Qualified	Builder.com Banner	12	33.33%
		Lycos Banner	9		25.00%	\$45.00	25.00%
		Intergreat Banner	7		19.44%	\$35.00	19.44%

		Yahoo! Banner	4	11.11%	\$20.00	11.11%
		HotWired WebMonkey Banner	3	8.33%	\$15.00	8.33%
		Excite Banner	1	2.78%	\$5.00	2.78%
		<b>Subtotal</b>	<b>36</b>	<b>100.00%</b>	<b>\$180.00</b>	<b>100.00%</b>
	Moderately Qualified	Intergreat Banner	19	29.69%	\$66.50	29.69%
		Builder.com Banner	15	23.44%	\$52.50	23.44%
		Lycos Banner	13	20.31%	\$45.50	20.31%
		HotWired WebMonkey Banner	11	17.19%	\$38.50	17.19%
		Yahoo! Banner	6	9.38%	\$21.00	9.38%
		Excite Banner	0	0.00%	\$0.00	0.00%
		<b>Subtotal</b>	<b>64</b>	<b>100.00%</b>	<b>\$224.00</b>	<b>100.00%</b>
	Minimally Qualified	Builder.com Banner	28	26.42%	\$70.00	26.42%
		Intergreat Banner	22	20.75%	\$55.00	20.75%
		Lycos Banner	21	19.81%	\$52.50	19.81%
		HotWired WebMonkey Banner	16	15.09%	\$40.00	15.09%
		Yahoo! Banner	13	12.26%	\$32.50	12.26%
		Excite Banner	6	5.66%	\$15.00	5.66%
		<b>Subtotal</b>	<b>106</b>	<b>100.00%</b>	<b>\$265.00</b>	<b>100.00%</b>
	<b>Total</b>		<b>206</b>	<b>-</b>	<b>\$669.00</b>	<b>-</b>

Table 7

Ad Campaign Costs						
	Ad Campaign	Cost This Period	Total Visitor Sessions	Cost Per Visitor	Qualified Visitor Sessions	Cost Per Qualified Visitor
1	Yahoo! Banner	\$1,250.00	1303	\$0.96	205	\$6.10
2	Excite Banner	\$433.00	980	\$0.44	90	\$4.81
3	Builder.com Banner	\$1,250.00	900	\$1.39	247	\$5.06
4	Intergreat Banner	\$200.00	605	\$0.33	146	\$1.37
5	Lycos Banner	\$2,000.00	443	\$4.51	131	\$15.27
6	HotWired WebMonkey Banner	\$1,250.00	257	\$4.86	64	\$19.53
	<b>Total</b>	<b>\$6,383.00</b>	<b>4488</b>	<b>\$1.42</b>	<b>883</b>	<b>\$7.23</b>

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Table 8

Ad Campaign Return on Investment						
	Ad Campaign	# Days Active This Period	Cost of Campaign This Period	Total Visitor Value Generated	ROI This Period	%ROI This Period
1	Yahoo! Banner	7	\$1,250.00	\$3,229.50	\$1,979.50	158.36%
2	Excite Banner	16	\$433.00	\$2,238.00	\$1,805.00	416.86%
3	Intergreat Banner	5	\$200.00	\$1,540.50	\$1,340.50	670.25%
4	Builder.com Banner	7	\$1,250.00	\$2,511.50	\$1,261.50	100.92%
5	HotWired WebMonkey Banner	9	\$1,250.00	\$652.50	(\$597.50)	-47.80%
6	Lycos Banner	12	\$2,000.00	\$1,194.00	(\$806.00)	-40.30%
	<b>Total</b>	<b>-</b>	<b>\$6,383.00</b>	<b>\$11,366.00</b>	<b>\$4,983.00</b>	<b>78.07%</b>

10

Table 9

Ad Campaign Daily Return on Investment					
	Ad Campaign	# Days Active This Period	Cost Per Day	Visitor Value Per Day	ROI Per Day
1	Yahoo! Banner	7	\$178.57	\$461.36	\$282.79
2	Intergreat Banner	5	\$40.00	\$308.10	\$268.10
3	Builder.com Banner	7	\$178.57	\$358.79	\$180.21
4	Excite Banner	16	\$27.06	\$139.88	\$112.81
5	HotWired WebMonkey Banner	9	\$138.89	\$72.50	(\$66.39)
6	Lycos Banner	12	\$166.67	\$99.50	(\$67.17)
	<b>Total</b>	-	<b>\$563.09</b>	<b>\$1,340.62</b>	<b>\$777.52</b>

Turning now to Figs. 10 and 11, illustrated therein is a flow chart, indicated generally as program 800, depicting steps in a computer program constructed in accordance with the present invention. As is the case with the previously described programs, program 800 operates on server 10 in the present embodiment of the invention, although this is not required.

Program 800 is advantageous in that it tracks only criteria of interest for each active visitor session and--at the conclusion of each session--determines whether the visitor whose session was monitored meets the criteria for each qualification profile. And if so, the program assigns the visitor accordingly. This naturally requires less processing and memory resources than program 700.

Turning now to Fig. 10, in step 801, the program checks to see if there are more hits in the log file. If so, in step 805, the program reads the next hit generated by interaction of a remote visitor with server 10. If it is a hit from a new visitor, i.e., there is no visitor session active for the particular visitor who produced the current hit, a new visitor session is created in step 815. At the same time, the visitor session is assigned to an entry page and referrer and to an ad campaign in steps 817, 819, respectively, as described above. Thereafter, a checklist is assigned to the new visitor session in 820. The checklist is merely a list of all of the requirements for each qualification level in each qualification profile. In the case where criteria for each of the requirements are selected web pages identified by URLs on the site, the checklist assigned to each visitor session in step 820 is merely a list of all of those URLs.

Returning again to step 810, if there is a visitor session active for the particular visitor who produced the current hit, that visitor's session is updated. When a visitor session is updated responsive to a current hit from that visitor, the information in the hit is examined to determine whether or not any of the URLs on the checklist were visited and, if so, that URL

is flagged. In the present embodiment of the invention, the same checklist is assigned to each visitor session.

This process begins in step 824 when the hit is examined to determine whether or not the page is on the checklist. If so, that page on the list is flagged in step 825, and a session timing clock, which is unique to each visitor session, is reset and started in step 830. If not, the program moves from step 824 to step 830 to reset and start the clock associated with that visitor session. In other words, every hit from the visitor resets and starts the clock in step 830 whether the visitor views a page on the checklist or not. After resetting and starting the clock, the program— in step 835— checks each open visitor session. For each session, in step 840, the program determines whether the clock associated with that visitor session has timed out. Put differently, it determines whether the predetermined time used to define each visitor session has lapsed without another hit from that visitor. If not, the program leaves the visitor session open and returns control to step 835 to check the next visitor session. If the session has lapsed, the program closes that session in accordance with Fig. 11, which is described shortly, and returns control to step 835 to check the next session. After all current sessions are checked using the routine in steps 835, 840, and Fig. 11, control is transferred again to step 801 to check for more hits, as described above.

When there are no more hits in the log file, control transfers to decision box 837, which checks all remaining open visitor sessions and closes each in accordance with Fig. 11. Each time a session is closed, control again returns to step 837 to close the next visitor session until all are closed by the Fig. 11 routine. Control then goes to step 839, wherein the ROI analysis is performed in the same manner as described in connection with the embodiment of Figs. 7-9.

Turning now to Fig. 11, consideration will be given to the manner in which a visitor session is closed. With reference to Fig. 10, this occurs after step 840, when each session expires, and after step 801, when there are no more hits to process and all remaining visitor sessions are consequently closed. In steps 845, 850, the session is closed, and the checklist associated with the session is examined to determine which pages the visitor viewed during the visitor session. In step 855 the flagged pages are compared with the pages designated in each qualification level within each qualification profile. In step 860, the visitor is assigned to the highest qualification level, like qualification level 315 in Fig. 5, in each qualification profile, like qualification profile 305 in Fig. 5, for which she qualifies. This is accomplished



in the same manner as described in connection with Fig. 9. Next, in step 865, Tables A and B are updated accordingly. It is from these tables that data are extracted, as described above, to produce tables like those shown in Tables 1-9 above.

5 Having illustrated and described the principles of our invention in a preferred embodiment thereof, it should be readily apparent to those skilled in the art that the invention can be modified in arrangement and detail without departing from such principles. We claim all modifications coming within the spirit and scope of the accompanying claims.

## CLAIMS

We claim:

1. A method for evaluating an advertising campaign on a first web server to  
5 which visitors are referred by a link located on a second web server, said method comprising:  
defining a plurality of qualification levels for the first web server;  
identifying the visitors who contacted the first web server via the link located on the  
second web server; and  
associating each visitor with a qualification level.  
10
2. The method of claim 1 wherein the qualification levels represent different  
levels of interest in a product or service offered for sale at the web site based on visitor  
activity of the web site.
- 15 3. The method of claim 1 wherein defining a plurality of qualification levels  
comprises associating each qualification level with at least one URL located on the first web  
server.
4. The method of claim 3 wherein defining a plurality of qualification levels  
20 further comprises associating one of the qualification levels with a plurality of the URLs  
located on the first web server.
5. The method of claim 4 wherein said method further comprises:  
determining which URLs on the first web server each visitor visited; and  
25 assigning each visitor to the qualification level associated with the URLs visited by  
the visitor.
6. The method of claim 1 wherein assigning each visitor to a qualification level  
comprises:  
30 comparing each visitor with criteria defining each qualification level; and  
associating each visitor with a qualification level whose criteria the visitor meets.

7. The method of claim 1 wherein said method further comprises assigning a quantitative value to each qualification level.

8. A method for analyzing traffic data generated by a web server connected via a network to a plurality of computing devices operated by visitors, said method comprising:  
5 associating different web pages on the web server with different qualification profiles;  
receiving a plurality of traffic data hits, each of said hits corresponding to data exchanged between the web server and one of the computing devices;  
analyzing the identified traffic data hits to determine which web pages the visitor  
10 viewed on the web server; and  
associating each visitor with a qualification profile.

9. The method of claim 8 wherein associating different web pages comprises associating different web pages on the web server with different qualification profiles so that  
15 the different qualification profiles correspond to different advertised products or services on the web pages.

10. The method of claim 9 wherein associating each visitor with a qualification profile comprises associating each visitor with a qualification profile if the web pages viewed  
20 by the visitor include the web pages associated with the qualification profile.

11. The method of claim 8 wherein one of said qualification profiles includes a plurality of qualification levels and wherein said method further includes associating visitors associated with said one qualification profile with said qualification levels.  
25

12. A network traffic tool for analyzing visitor activity at a first web server, said tool comprising:  
a plurality of qualification profiles wherein each qualification profile includes entry criteria;  
30 means for identifying visitors who contacted the first web server via a link on a second web server; and  
means for associating each visitor with a qualification profile.

13. The tool of claim 12 wherein the entry criteria of each qualification profile comprise web pages on the first web server.

5 14. The tool of claim 13 wherein the web pages in each entry criteria are associated with different products or services.

15. The tool of claim 12 wherein said means for identifying visitors who contacted the first web server comprises:

10 a log file for storing traffic data hits, each of said hits corresponding to data exchanged between the visitor and the first web server; and

means for analyzing the traffic data hits stored in the log file to determine the visitor who generated each traffic data hit.

15 16. The tool of claim 12 wherein the means for associating each visitor with a qualification profile comprises:

means for analyzing the traffic data hits stored in the log file to determine each visitor's activity; and

20 means for associating each visitor with a qualification profile if the visitor's activity includes the entry criteria for the qualification profile.

17. A method for evaluating visitors to a web site using traffic data generated by a web server hosting the site, said method comprising:

25 predetermining a first set of web site activity that could be taken by a visitor to the web site;

predetermining a second set of web site activity that could be taken by a visitor to the web site;

analyzing the activity of each visitor to the web site; and

tracking the number of visitors who take the first and second sets of activities.

30

18. The method of claim 17 wherein some of the visitors to the web site are referred there by a link located on a remote web site and wherein said method further includes determining how many of the tracked number of visitors are referred by said link.

5 19. The method of claim 18 wherein some of the visitors to the web site are referred there by a second link located on a remote web site and wherein said method further includes determining how many of the tracked number of visitors are referred by said second link.

10 20. The method of claim 17 wherein said first set of web site activity comprises visiting a predetermined page of the web site.

21. The method of claim 20 wherein said second set of web site activity comprises visiting a different predetermined page of the web site.

15

22. The method of claim 17 wherein said first set of web site activity comprises visiting a set of predetermined pages of the web site.

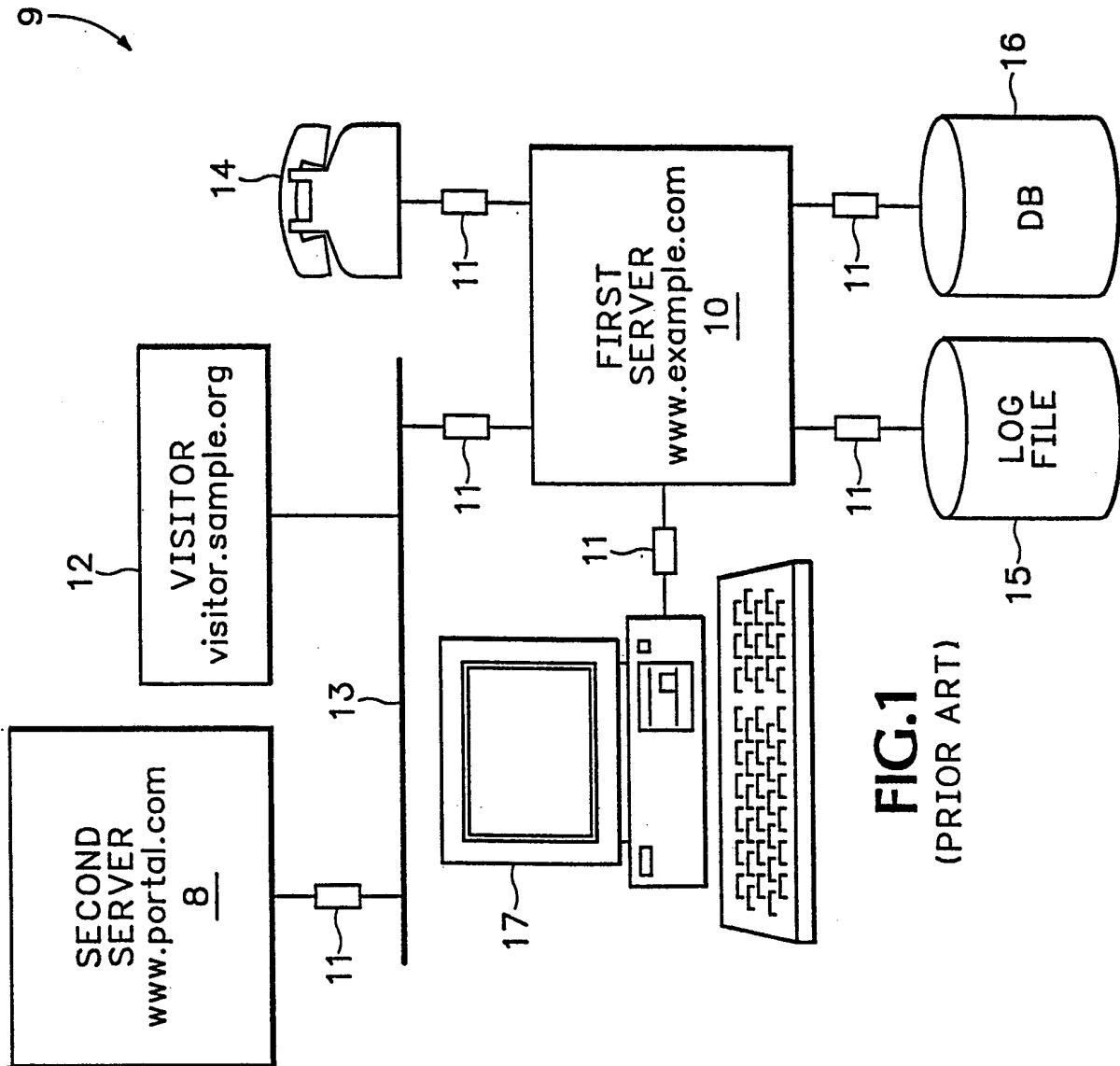
20 23. The method of claim 22 wherein said second set of web site activity comprises visiting a different set of predetermined pages of the web site.

24. The method of claim 17 wherein said method further comprises establishing a visitor session for each visitor to the web site and tracking the visitors activity during the visitor session.

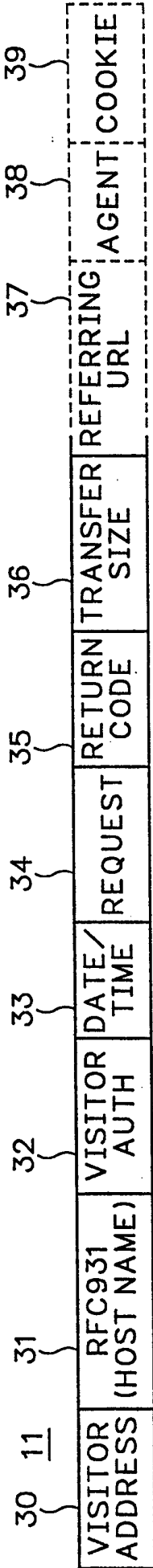
25

25. The method of claim 17 wherein said method further includes assigning a first value to each visitor who undertakes the first set of web site activity.

30 26. The method of claim 25 wherein said method further includes assigning a second value to each visitor who undertakes the second set of web site activity.

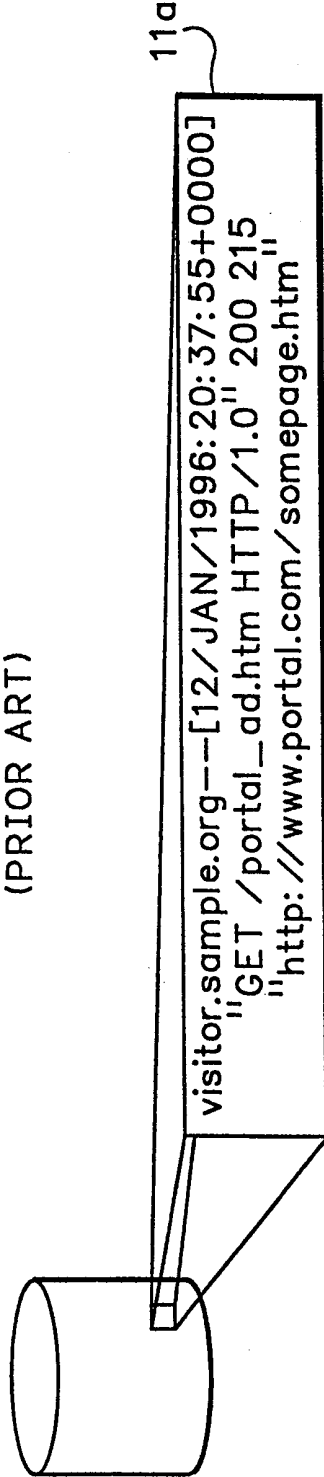


**FIG.1**  
(PRIOR ART)

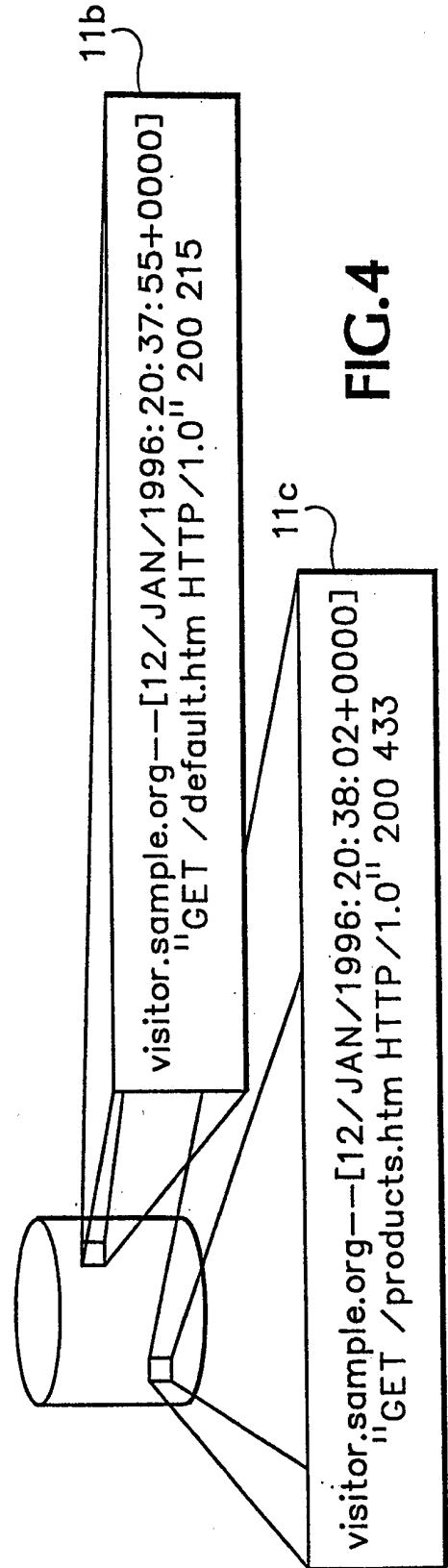


**FIG. 2**

(PRIOR ART)



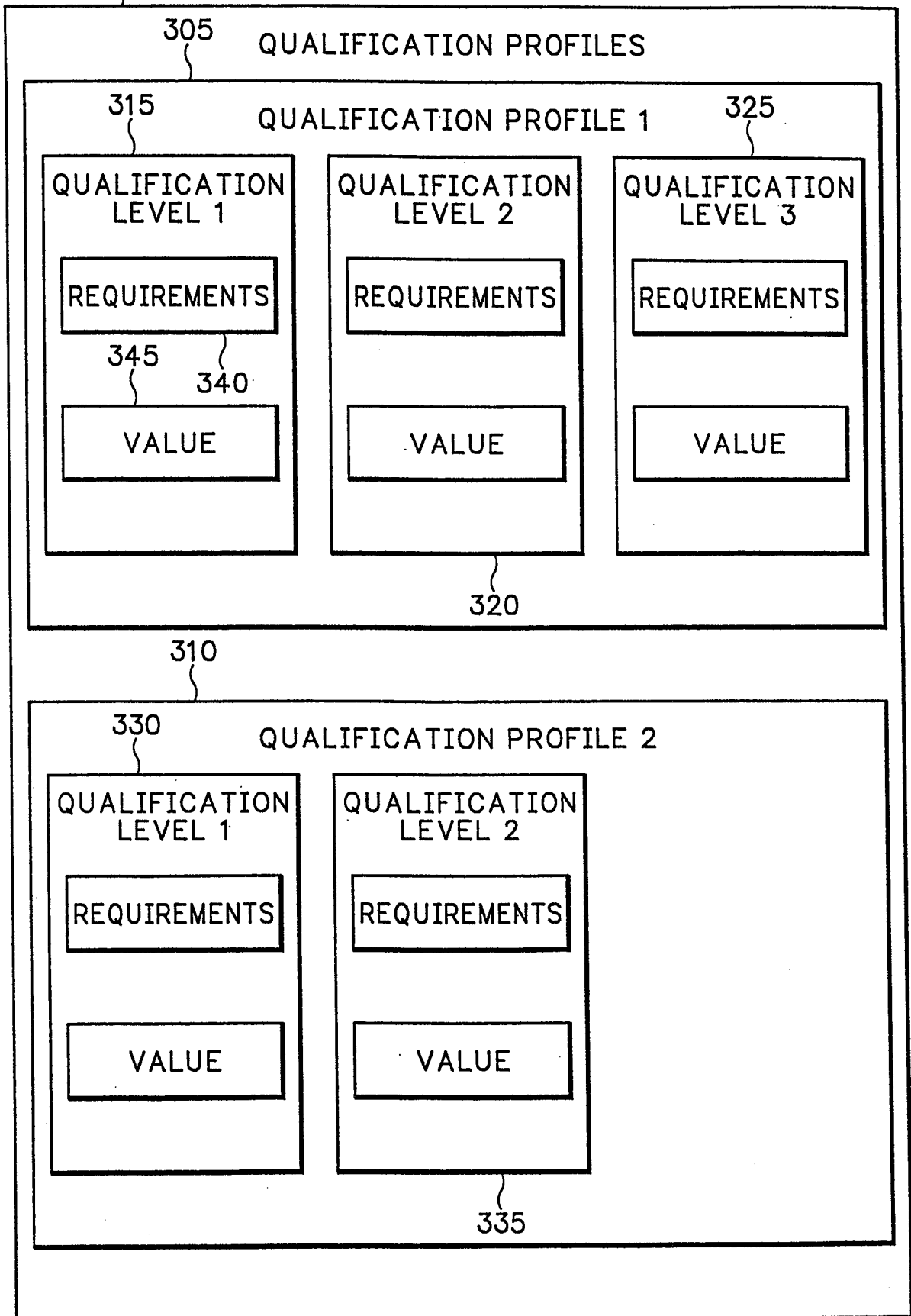
**FIG. 3**



**FIG. 4**

300

3/9



**FIG.5**



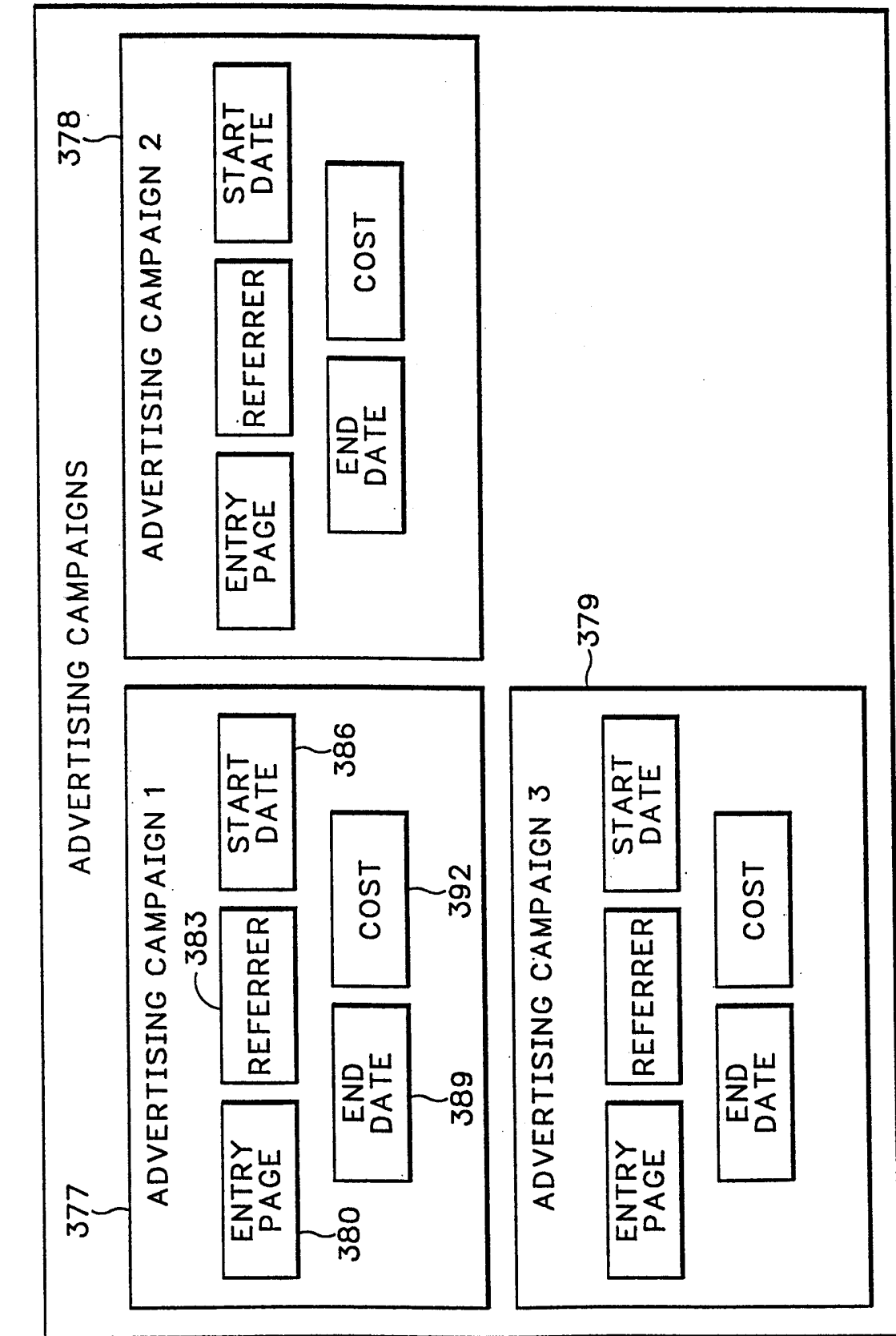


FIG.6

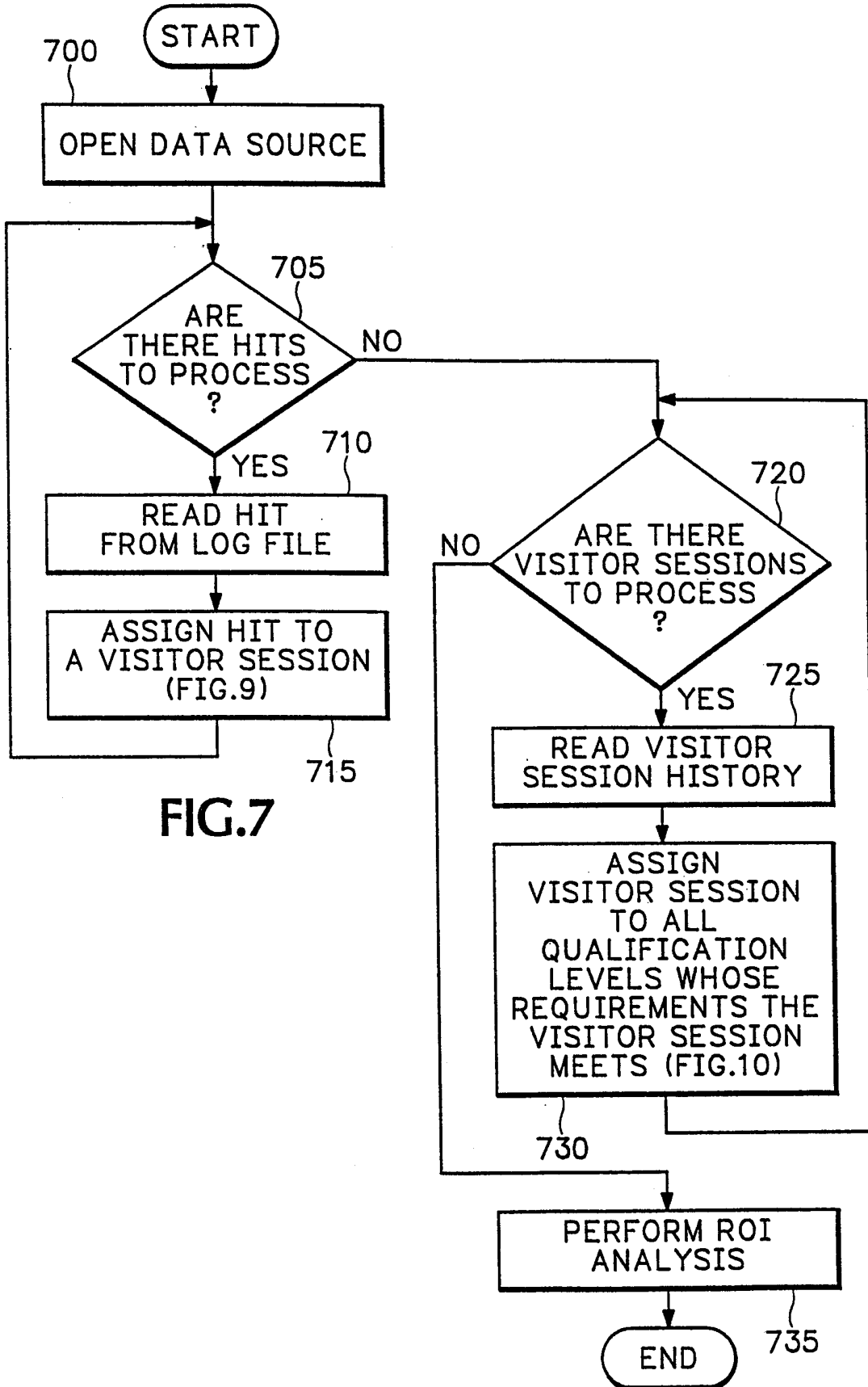


FIG.7

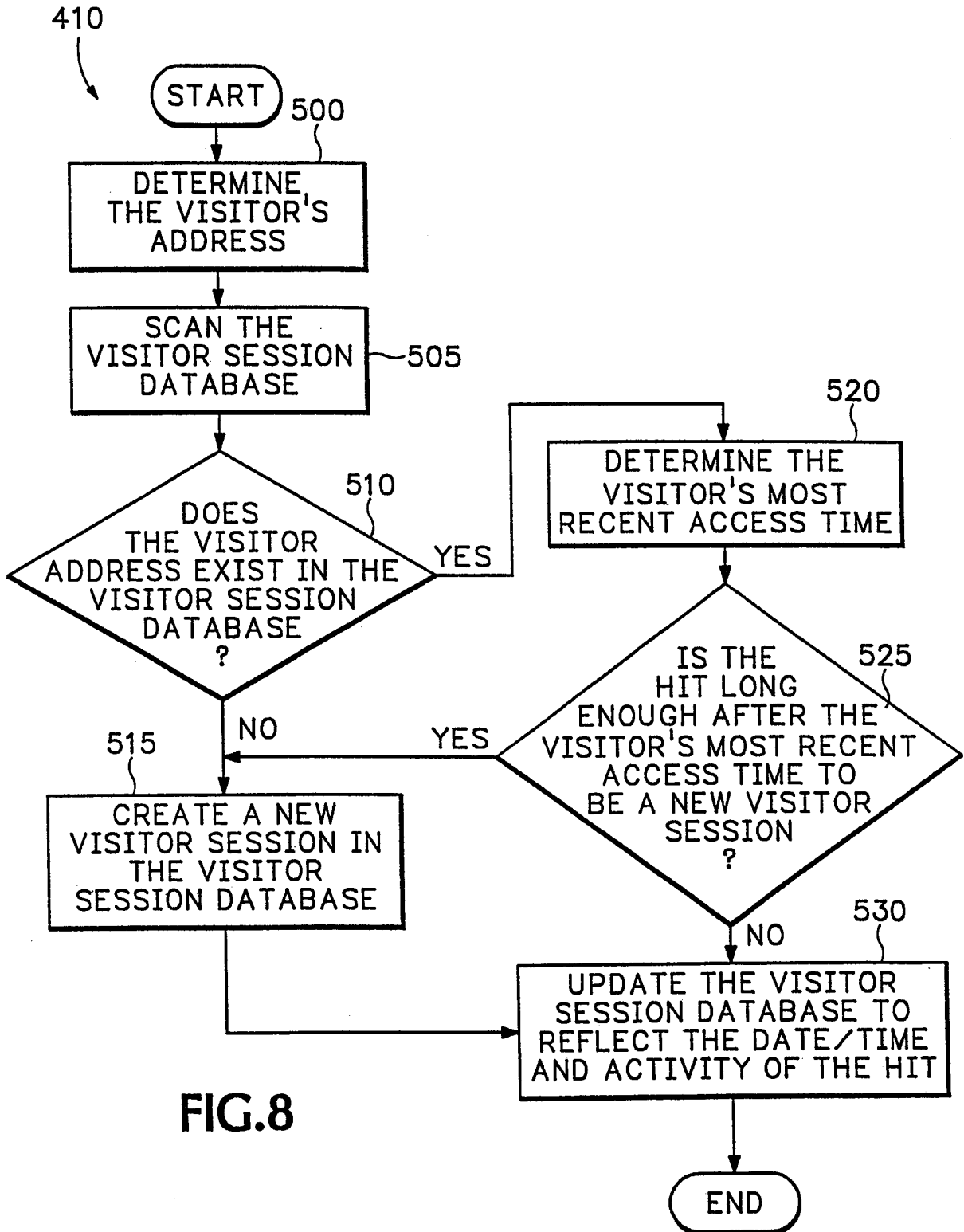


FIG.8

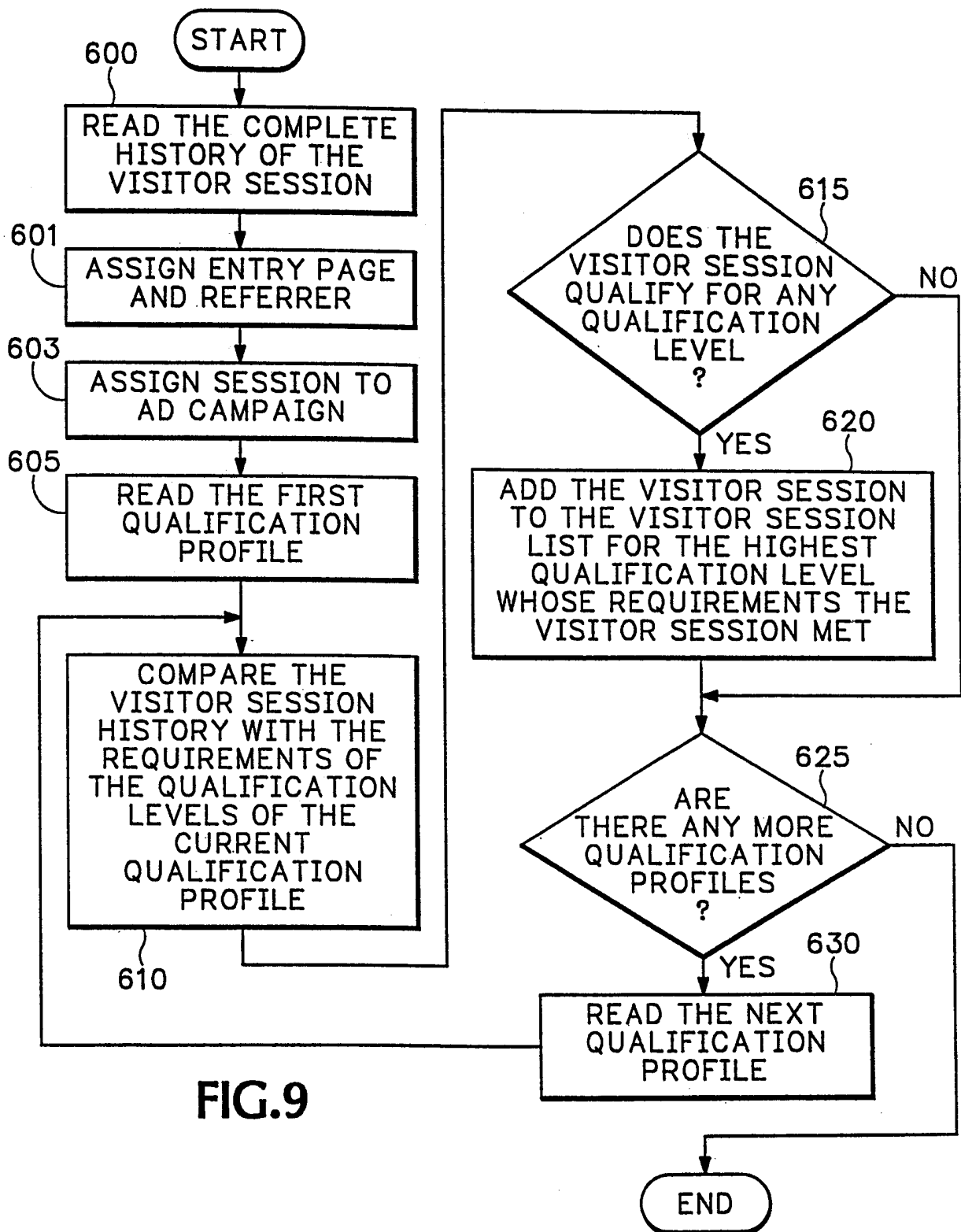


FIG.9

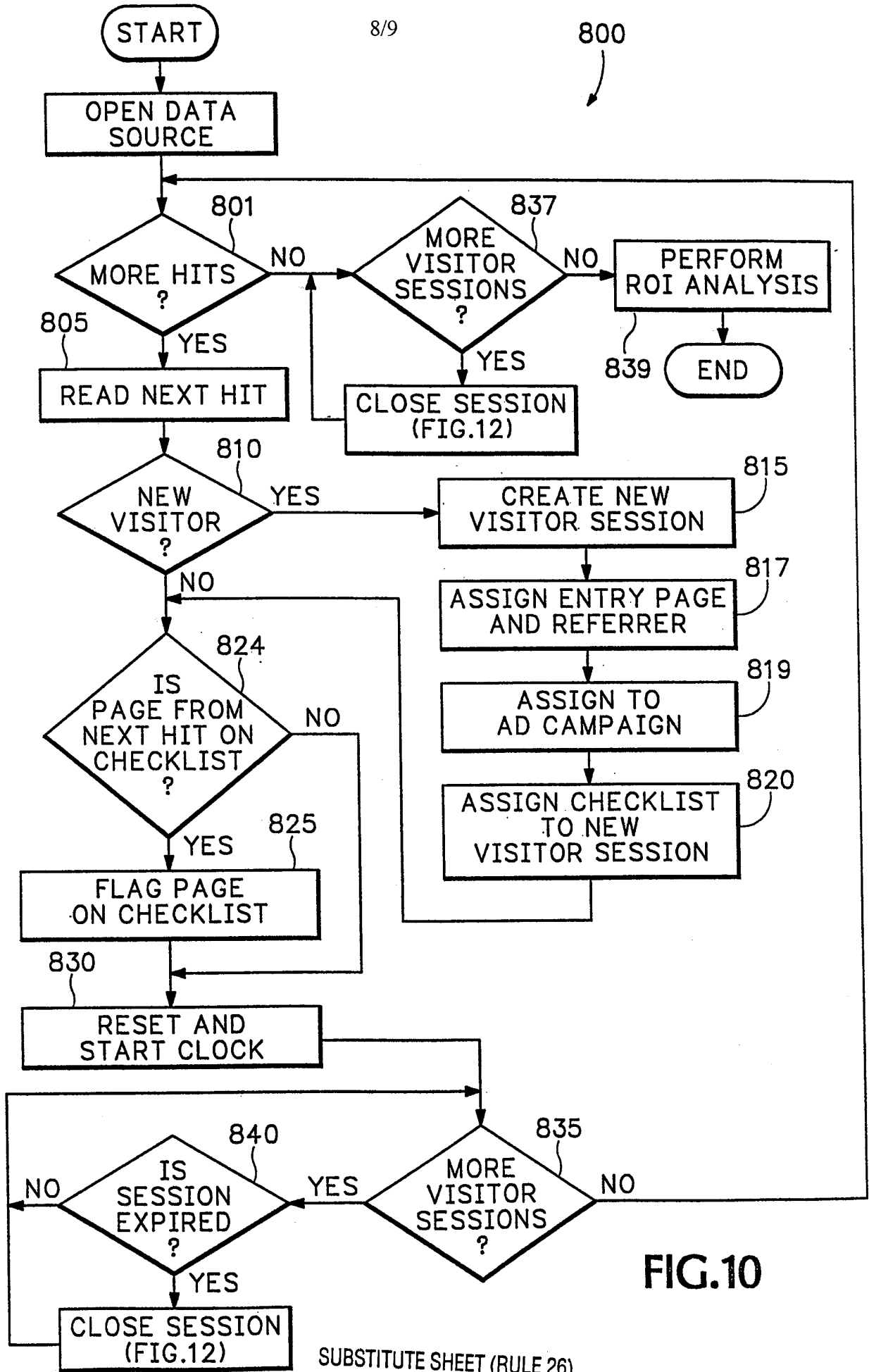
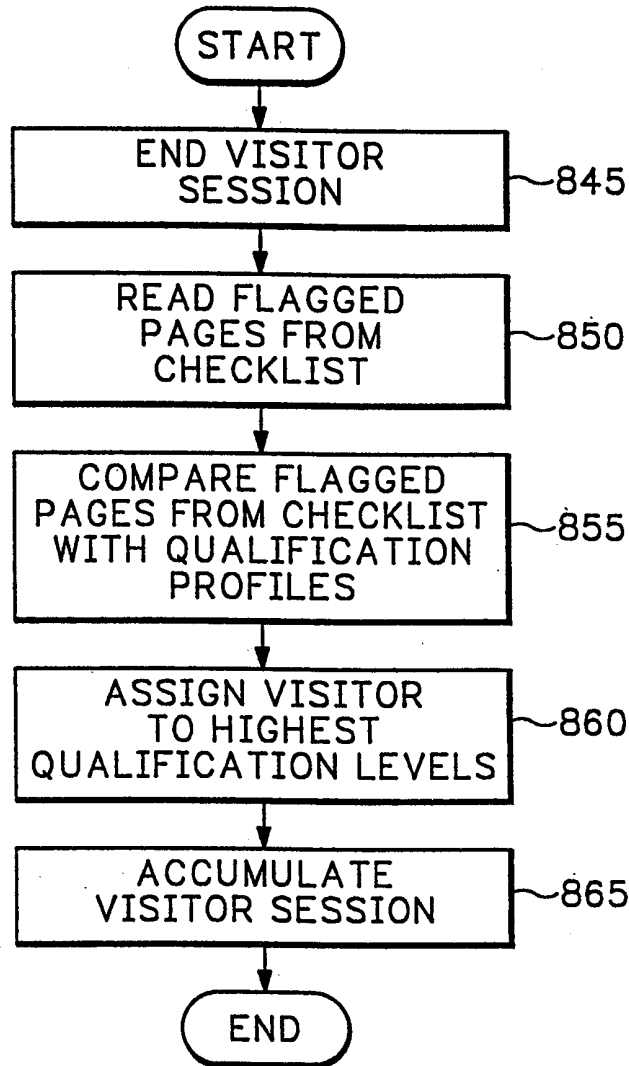


FIG.10



**FIG.11**

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/01820

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
IPC(7) : G06F 11/00, 13/00, 13/14, 17/60 US CL : 705/14; 714/47; 709/218, 224 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 705/14; 714/47; 709/218, 224		
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 practicable, search terms used) WEST, EAST, STN ONLINE, IEEE, Dialog		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,P	US 5,974,572 A (WEINBERG ET AL.) 26 October 1999, see entire document.	1-26
X,E	US 6,018,619 A (ALLARD ET AL.) 25 January 2000, see entire document.	1-7, 12-16
X,P ----	US 5,870,559 A (LESHEM ET AL.) 09 February 1999, see entire document.	17-26 -----
Y,P		8-11
Y,P	US 5,996,007 A (KLUG ET AL.) 30 November 1999, see entire document.	8-11
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* *A* *E* *L* *O* *P*	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance earlier document published on or after the international filing date 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) document referring to an oral disclosure, use, exhibition or other means document published prior to the international filing date but later than the priority date claimed	*T* *X* *Y* *&*
		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 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 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 23 MAY 2000	Date of mailing of the international search report 27 JUN 2000	
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer ALLEN MACDONALD <i>Joni Hill</i> Telephone No. (703) 305-9708	