US 20020191762A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2002/0191762 A1**

Benson (43) **Pub. Date: Dec. 19, 2002**

(54) **SYSTEM AND METHOD FOR REAL-TIME REPORTING OF ADVERTISING EFFECTIVENESS**

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(21) Appl. No.: **10/215,783**

(22) Filed: **Aug. 9, 2002**

Related U.S. Application Data

(63) Continuation of application No. 09/350,785, filed on Jul. 9, 1999, now Pat. No. 6,470,079.

Publication Classification

(51) **Int. Cl.**[7] **H04M 11/00**; H04M 15/00

(52) **U.S. Cl.** **379/133**; 379/114.13; 379/114.28; 379/115.01; 379/121.01

(57) **ABSTRACT**

A telecommunications environment includes a switch for connecting calls placed by a caller in response to an advertising campaign. The advertising campaign is identified by a particular directory number (the "campaign number"). The switch monitors calling information related to the call and forwards that calling information to a data recorder. The calling information includes the directory number of the party placing the call, the directory number called, whether the call was connected, the duration of the call, and other information. The data recorder passes the calling information for each advertising campaign to a web server where the calling information is accessible over the Internet. In this manner, a subscriber may connect to the web server over the Internet and request a report on the effectiveness of the advertising campaign.

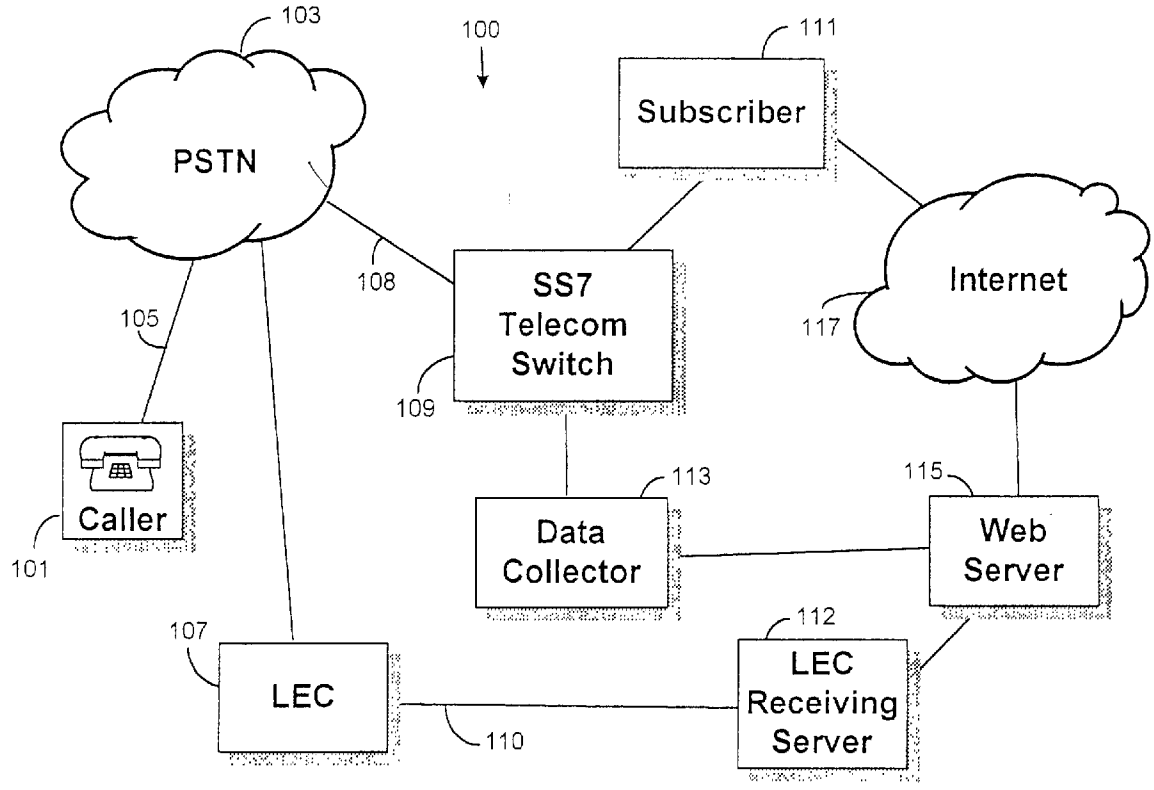


Fig. 1

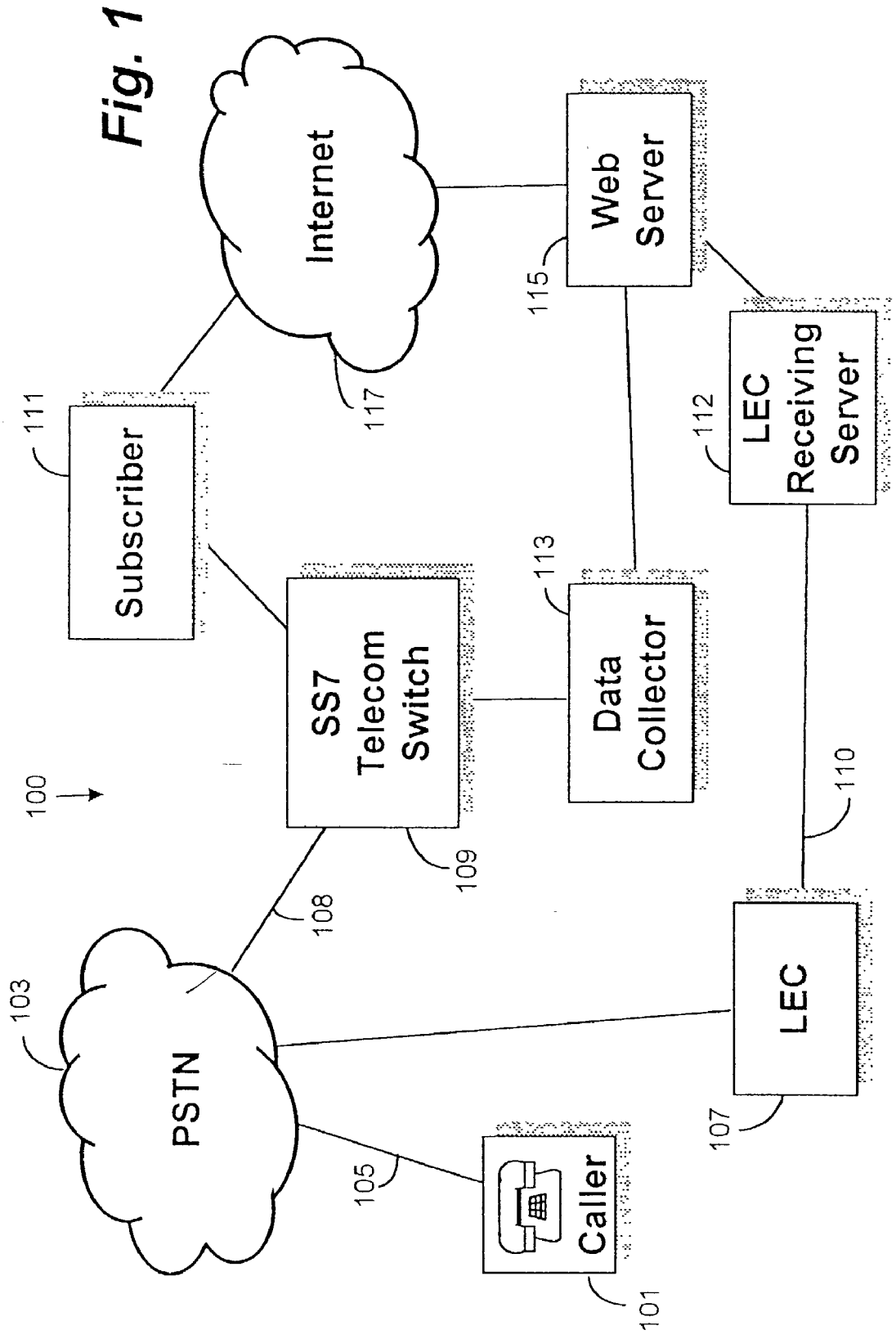
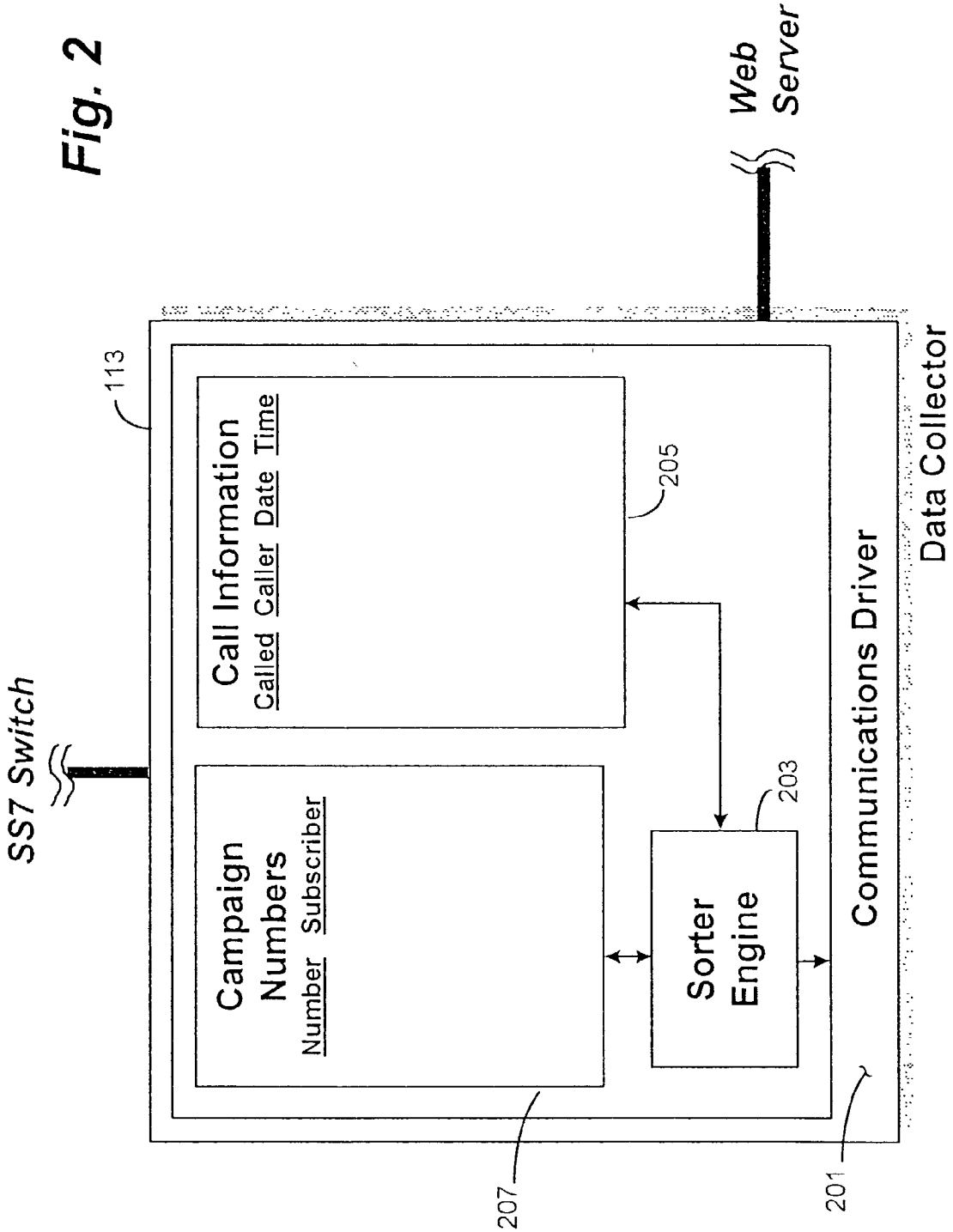

Internet
117
Web Server
115
Subscriber
111
LEC Receiving Server
112
SS7 Telecom Switch
109
Data Collector
113
100
110
108
PSTN
103
LEC
107
105
Caller
101

Fig. 2


Web Server
SS7 Switch
113
Call Information
Called Caller Date Time
205
Campaign Numbers
Number Subscriber
Sorter Engine
203
Communications Driver
Data Collector
207
201

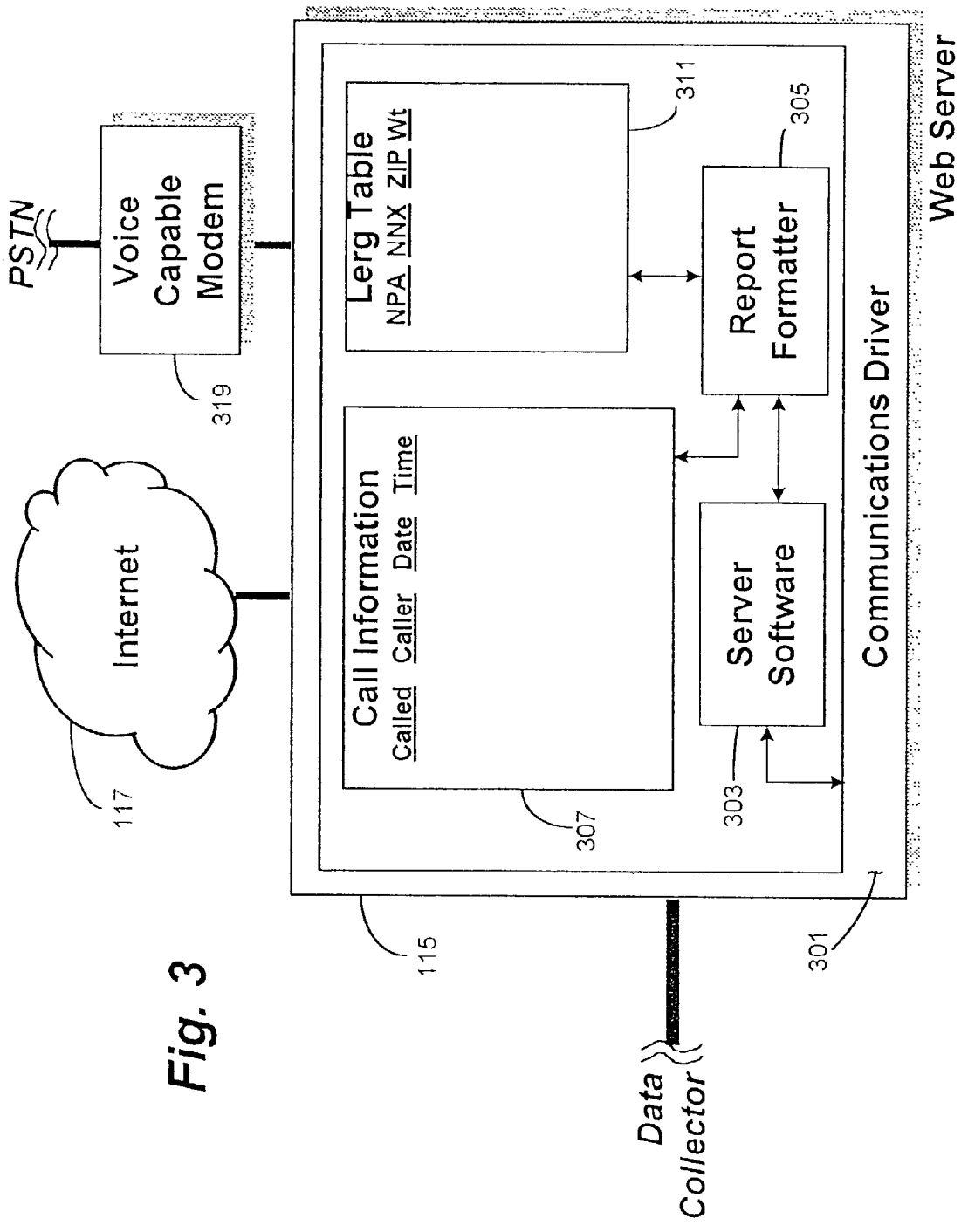

PSTN
Voice Capable Modem
319
Internet
117
Web Server
Communications Driver
Lerg Table
NPA NNX ZIP Wt
311
Report Formatter
305
Call Information
Called Caller Date Time
307
Server Software
303
115
301
Data Collector

Fig. 3

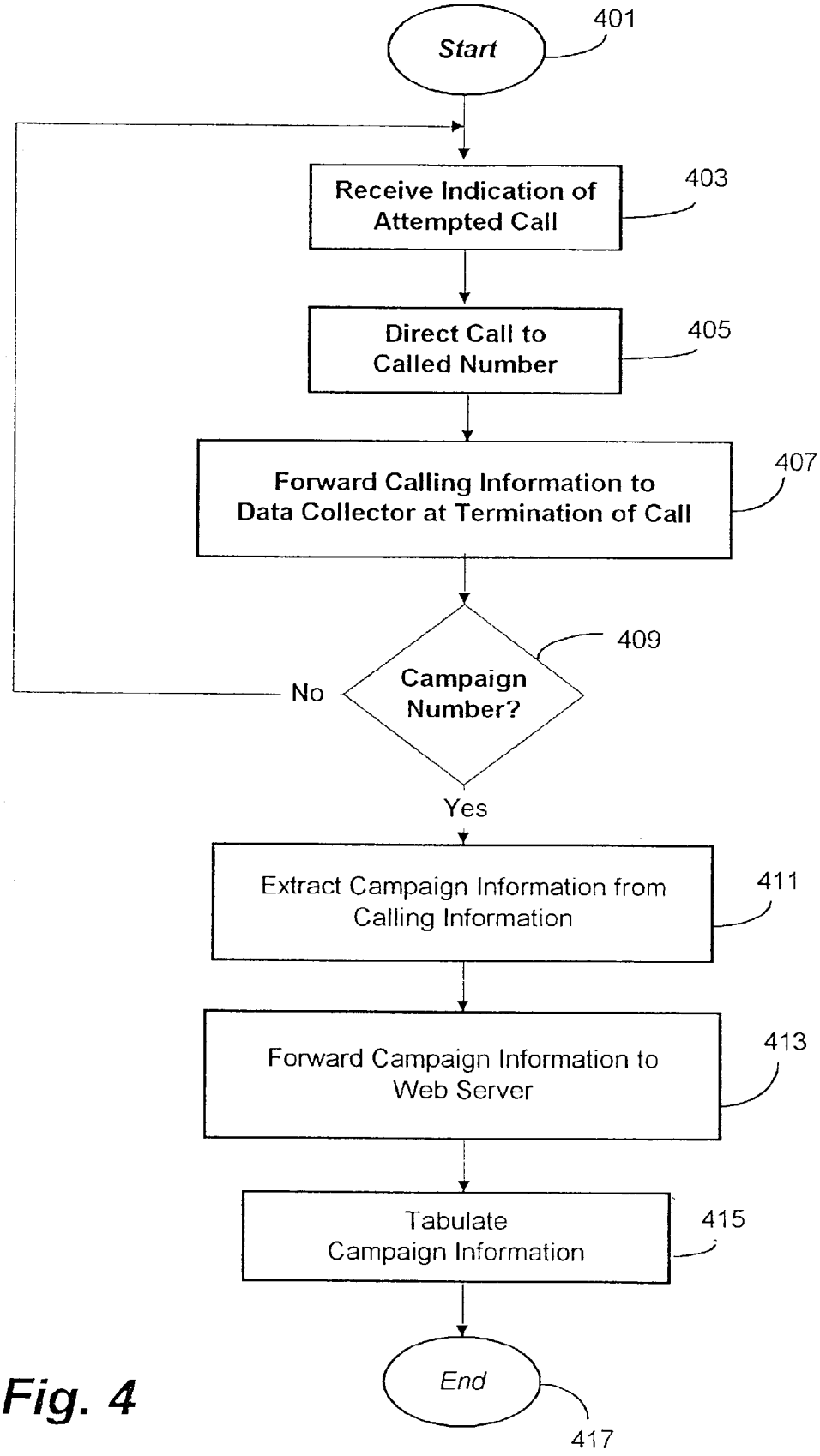

Start
401
Receive Indication of Attempted Call
403
Direct Call to Called Number
405
Forward Calling Information to Data Collector at Termination of Call
407
Campaign Number?
409
No
Yes
Extract Campaign Information from Calling Information
411
Forward Campaign Information to Web Server
413
Tabulate Campaign Information
415
End
417

Fig. 4

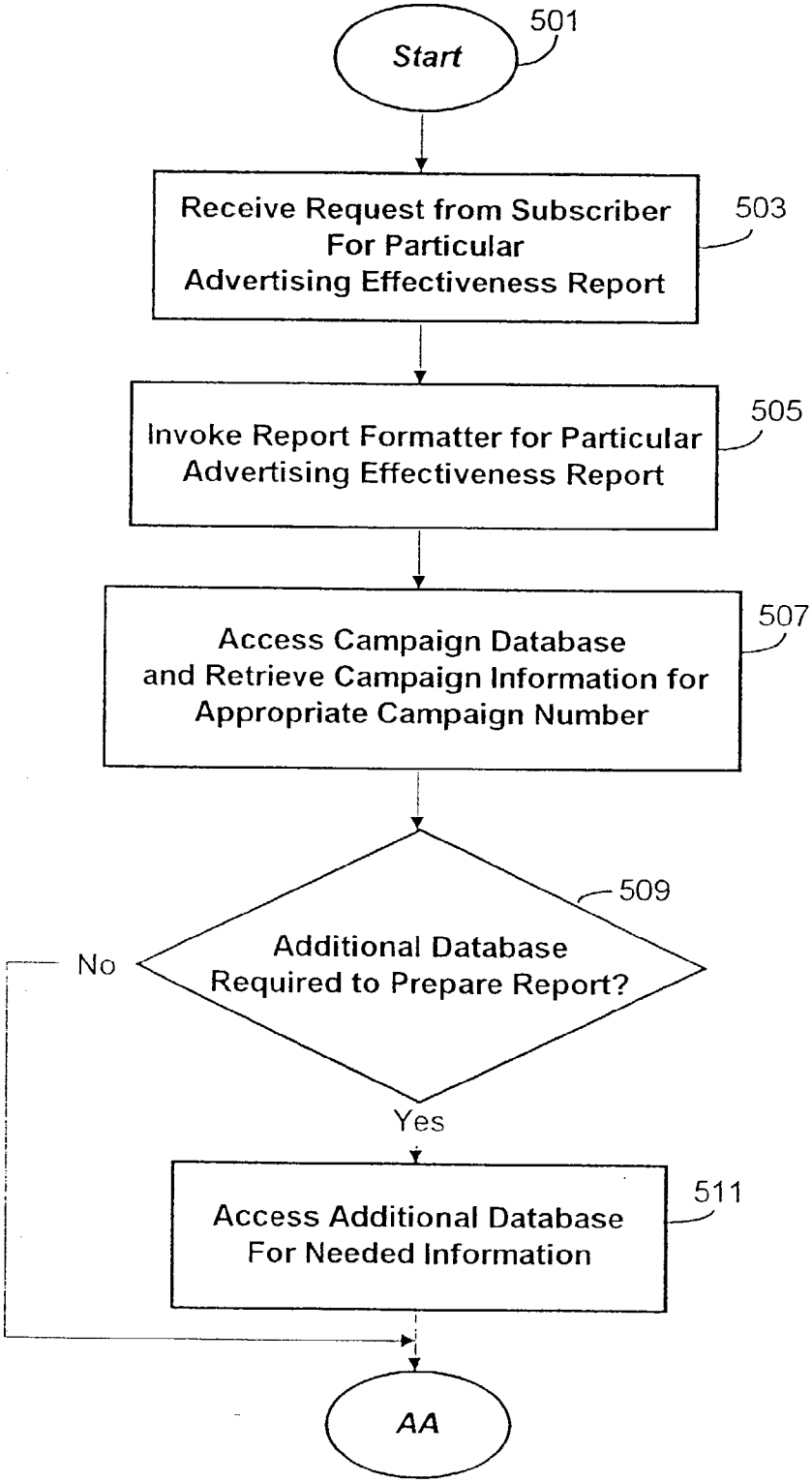

Start
501
Receive Request from Subscriber For Particular Advertising Effectiveness Report
503
Invoke Report Formatter for Particular Advertising Effectiveness Report
505
Access Campaign Database and Retrieve Campaign Information for Appropriate Campaign Number
507
Additional Database Required to Prepare Report?
509
No
Yes
Access Additional Database For Needed Information
511
AA

Fig. 5A

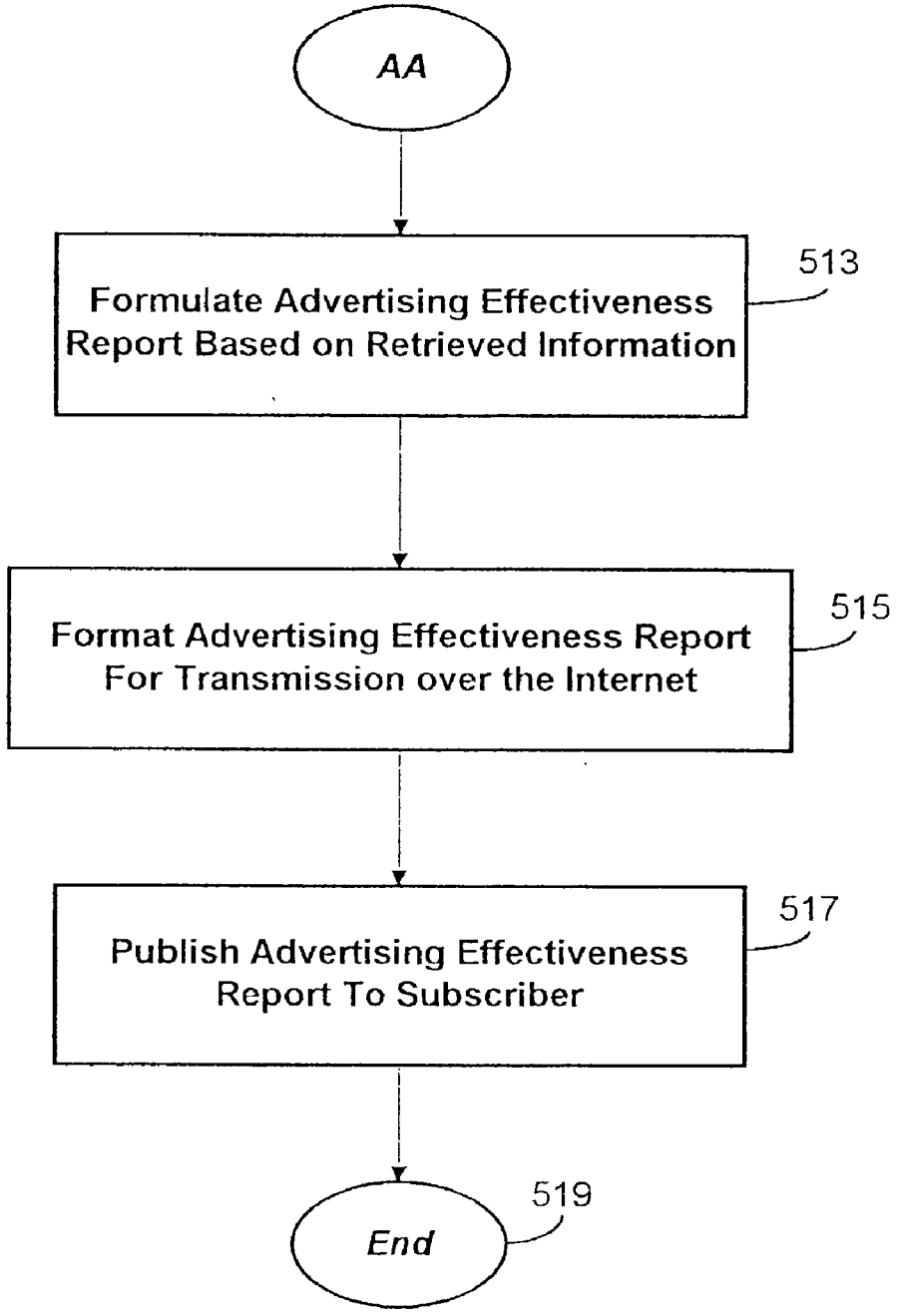

AA
Formulate Advertising Effectiveness Report Based on Retrieved Information
513
Format Advertising Effectiveness Report For Transmission over the Internet
515
Publish Advertising Effectiveness Report To Subscriber
517
End
519

Fig. 5B

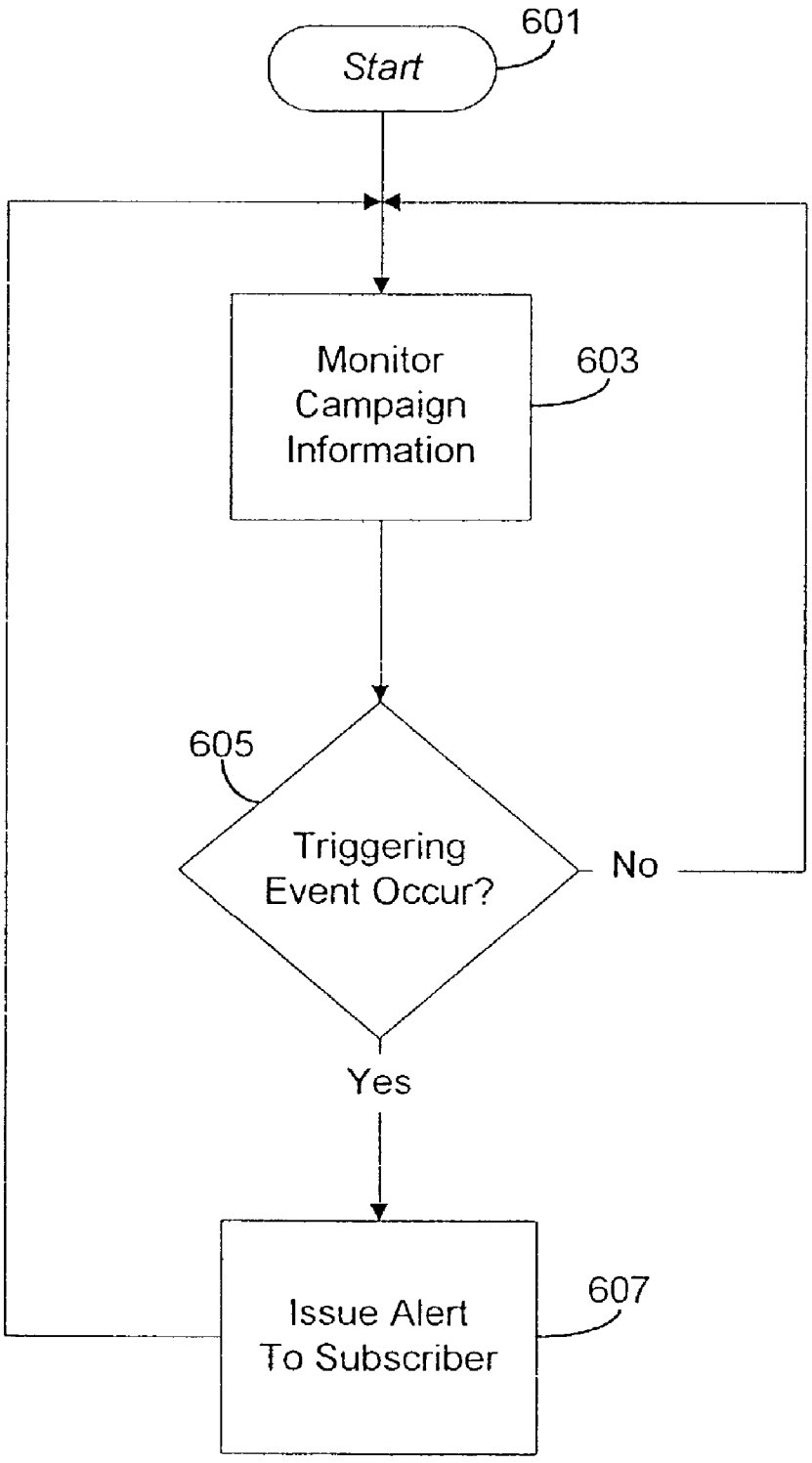

601
Start
Monitor Campaign Information
603
605
Triggering Event Occur?
No
Yes
Issue Alert To Subscriber
607

Fig. 6

SYSTEM AND METHOD FOR REAL-TIME REPORTING OF ADVERTISING EFFECTIVENESS

FIELD OF THE INVENTION

[0001] The present invention relates to telecommunications systems, and more particularly to the use of telecommunications systems to report on the call traffic to particular directory numbers.

BACKGROUND OF THE INVENTION

[0002] Advertisers today struggle with trying to identify which advertising is effective and, more importantly, which is not. Advertisers may spend several thousand dollars or more producing advertising campaigns in an attempt to capture the attention of an intended market. Those advertisers try to target their advertising to particular groups of consumers by tailoring the advertising campaign media, the frequency of the campaign, the nature of the advertisements, and many other techniques. Advertisers may place advertisements in newspapers, magazines, trade journals, direct mailings, yellow pages and television. Unfortunately, advertisers do not have an accurate and timely mechanism for gauging the effectiveness of their advertising campaigns. An age old quote sums up the dilemma of the advertisers: "Half the money I spend on advertising is wasted, and the trouble is, I don't know which half."

[0003] Some attempts are being made to identify which advertising campaigns are effective. Examples are the use of different directory numbers (phone numbers) for each advertising campaign. In that way, advertisers may analyze their phone bills at the end of the month and count the number of calls placed to particular directory numbers. That mechanism is crude, inefficient, and untimely. Business people that are focusing on increasing sales and building products or training service people do not have the time to count phone numbers on their phone bills. An automated system that is capable of providing the advertiser with tailored and accurate reports on which advertising campaigns are effective has eluded those skilled in the art.

[0004] In addition, the advertiser may be conducting a costly advertising campaign that would be best discontinued immediately if only the advertiser could evaluate immediately whether the campaign was effective. Monthly phone bills or reporting are inadequate to service that advertiser's needs. In addition, such reporting does not capture a crucial piece of information to the advertiser—what calls were attempted to the advertiser but were not completed because of a busy signal or no answer. That information is not available through conventional telephone billing or reporting services. However, that information is extremely valuable to the advertiser. The advertiser would very much like to identify those potential consumers for whom the advertising was effective, but whose needs were unsatisfied because of a no answer or a busy signal.

[0005] An effective mechanism for an advertiser to monitor advertising effectiveness has eluded those skilled in the art. Accordingly, a need exists for a system or method for evaluating and reporting on the effectiveness of an advertising campaign being conducted by an advertiser and which is capable of generating a report in near-real-time so that an advertiser always has current information upon which to base its advertising decisions.

SUMMARY OF THE INVENTION

[0006] The present invention overcomes the problems identified above by providing a system and method for accurately and timely identifying which of an advertiser's advertising campaigns are effective. Briefly described, the invention provides a telecommunications environment configured to monitor information related to caller traffic responding to advertising campaigns. That information is passed to a network-accessible server and formatted for retrieval over the network. A subscriber to the reporting-service may connect, via the network, to the server and request a report, based on the caller traffic information, for a selected advertising campaign.

[0007] More specifically, the teleconmnunications environment includes a switch for connecting calls placed by a caller in response to an advertising campaign. The advertising campaign is identified by a particular directory number (the "campaign number"). The switch monitors calling information related to the call and forwards that calling information to a data recorder. The calling information includes the directory number of the party placing the call, the directory number called, whether the call was connected, the duration of the call, and other information. The data recorder passes the calling information for each advertising campaign to a web server where the calling information is accessible over the Internet. In this manner, the subscriber may connect to the web server over the Internet and request a report on the effectiveness of the advertising campaign.

[0008] In one aspect of the invention, the web server automates the task of identifying the calls made in response to an advertising campaign. The data collector is configured to identify calling information related to a directory number associated with an advertising campaign and forward that information to the web server. The web server includes software for tabulating and formatting that information into a report based on a subscriber's request. The report is generated based on the current information available and in the format specified by the subscriber. The information may be presented based on many different criteria, such as, for example, a total number of calls per campaign, a percentage of calls per campaign, a number of attempted calls that received a busy signal, a number of attempted calls that were not answered, and the like.

[0009] In another aspect of the invention, the reports available to the subscriber reflect the latest information available. The calling information may be forwarded from the data collector to the web server in real-time, as the calling information becomes available from the switch. In that manner, a report generated by the web server provides the subscriber with real-time data regarding the effectiveness of the advertising campaigns.

[0010] In yet another aspect of the invention, the calling information associated with advertising campaigns may be combined with other information, stored in additional databases either resident on or accessible by the web server, to produce reports of demographic information about the respondents to the campaign.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The foregoing aspects and many of the attendant advantages of this invention will become more readily

appreciated as the same becomes better understood by reference to the following detailed description, when taken in conjunction with the accompanying drawings, wherein:

[0012] **FIG. 1** is a functional block diagram illustrating a telecommunications environment in accordance with one embodiment of the present invention;

[0013] **FIG. 2** is a functional block diagram of a data collector element of the telecommunications environment illustrated in **FIG. 1**;

[0014] **FIG. 3** is a functional block diagram of a web server element of the telecommunications environment illustrated in **FIG. 1**;

[0015] **FIG. 4** is a flow chart illustrating a process for tabulating information related to the effectiveness of an advertising campaign in accordance with one embodiment of the present invention;

[0016] FIGS. **5A-5B** are flow charts illustrating a process for generating, in response to a subscriber's request, a report on the effectiveness of an advertising campaign in accordance with one embodiment of the present invention;

[0017] **FIG. 6** is a flow chart illustrating a process employed by one embodiment of the present invention for alerting a subscriber that a triggering event has occurred.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] As summarized above, the present invention allows a reporting-service subscriber to request reports, in real-time, on the effectiveness of an advertising campaign being undertaken by the service subscriber. With reference to the drawings, in which like numerals indicate like elements throughout the several figures, embodiments of the invention will now be described in detail.

[0019] Overview of Operating Environment

[0020] The following discussion provides an overview of a telecommunications environment in which one embodiment of the present invention may be employed. This discussion is intended to provide the reader with an understanding of the broad functionality of one telecommunications environment that makes possible the advantages of the present invention.

[0021] **FIG. 1** is a functional block diagram of a telecommunications environment including one embodiment of the present invention. Illustrated in **FIG. 1** is an exemplary telecommunications environment for placing telephone calls from one location to another location. At the core of the environment is a Public Switch Telephone Network ("PSTN") **103**. The PSTN **103** is a conventional telephone network that performs conventional telephone services such as connecting one user of the PSTN **103** to another user to complete a telephone call. One element of the PSTN **103** is the Local Exchange Carrier ("LEC") **107**. Briefly described, the LEC **107** is a central office servicing many users of the PSTN **103** in a common geographic location, such as in one city or county. The benefit of the LEC **107** to the present invention is discussed later. The PSTN **103** also includes switches, service control points, etc. The PSTN **103** may also include an advanced intelligent network ("AIN"), which is discussed later.

[0022] To operate with the PSTN **103**, users are assigned a unique ten digit directory number of the form "NPA-NXX-XXXX" where "N" refers to any numeric digit except 0 or 1 and "X" refers to any one of the 10 numeric digits. The PSTN **103** divides the United States into geographic regions identified by unique three-digit "area codes," more technically referred to as Numbering Plan Area ("NPA") codes. The three digit NPA field within the ten digit directory number refers to the Numbering Plan Area code. When a call is made from one area code to another area code, the three digit NPA prefix must be supplied by the calling party. In addition, certain NPA prefixes are reserved for special reverse-billing procedures, such as the "800,""877,""888," and "900" prefixes. Reverse billing is known in the art.

[0023] The three digit prefix "NXX" is sometimes referred to as an "exchange code" or "office code." That three-digit field typically identifies a particular "switch" or local exchange carrier, such as LEC **107**, to which the called party is connected. The switch or local exchange carrier may service cellular communications customers, in which case the exchange code, being associated with a cellular switch, identifies the called party as a cellular customer. The last four digits of the ten-digit directory number, identified above by "XXXX," are referred to as the user's line code and identify the particular user's connection to the switch identified by the exchange code. For the purpose of this discussion, the user initiating a call is referred to as the "calling party," and the user to whom the call is intended is referred to as the "called party."

[0024] An advanced intelligent network ("AIN") portion of the PSTN **103** may be used to expedite the connection between a calling party and a called party. The AIN is used to transmit data messages between elements of the PSTN **103** for establishing the connection. The data messages contain information related to the call, such as both the calling party's directory number and the called party's directory number. That information can be used to more quickly identify a destination switch for receiving the call. In addition, the AIN is helpful to determine supplemental telecommunications services that either the calling party or the called party may have, such as call forwarding, call waiting, caller identification, etc.

[0025] The protocol used by the AIN is often referred to in the art as "Signaling System 7" or "SS7." SS7 is an addressing protocol that speeds up call processing by transmitting call-connection information out-of-band much faster than traditional call switching. The SS7 protocol has enabled services such as fraud detection, caller ID, store and forward, ring back, concurrent data, etc. The SS7 protocol is well known to those skilled in the art and is described in a specification published by the American National Standards Institute (ANSI).

[0026] To place a call over the PSTN **103**, the calling party, such as Caller **101**, initiates a call by providing a directory number to the PSTN **103** via a piece of telecommunications terminal equipment, typically a telephone. In many cases, the calling party need not provide the entire ten-digit directory number. If, for instance, the calling party and the called party are in the same area code, the calling party may often omit the called party's NPA prefix.

[0027] The calling party provides the directory number of the called party to a first switch to which the calling party is

connected. For instance, if the Caller **101** wishes to call the Subscriber **111**, the Caller **101** provides to the PSTN **103** the Subscriber's directory number. The PSTN **103** then directs the call from the Caller **101** to a telecommunications switch to which the Subscriber **111** is connected. In this example, the Subscriber **111** is connected to switch **109**. The switch **109** is a conventional SS7 compatible switch, examples of which are the Lucent Technologies SESS, the NTI DMS100, Siemens Stromberg and Carlson EWSD and DCO. Those skilled in the art are familiar with the routing of calls within the PSTN **103** and connecting calls to a switch based on the called party's directory number. The switch **109** makes the final connection to the Subscriber **111** via connection **108**. Once that connection is made, the call is connected and the Caller **101** and the Subscriber **111** may communicate.

[**0028**] In addition to connecting the calling party to the called party, the switch **109** stores "calling information" related to the call. For example the switch **109** extracts the calling party's directory number, the called party's directory number, the time and date the call was placed, whether the call was connected successfully, the duration of the call if connected, whether the called party's connection was busy or did not answer, and any other information related to the call. The calling information is used for billing and network maintenance purposes, as well as other less common purposes unrelated to the present invention. The calling information is typically forwarded to a "data collector"**113** for relatively permanent storage. The data collector **113** may be a conventional data processing unit connected to the switch **109** or it may be part of the switch **109**. The data collector is described in greater detail below.

[**0029**] This has been an overview of the manner in which a common telecommunications system is used to make and connect calls between users of the system. The following discussion describes how the above described system, in accordance with one embodiment of the present invention, generates reports in real-time for the effectiveness of an advertising campaign.

[**0030**] Example of Advertising Campaign Recording

[**0031**] To begin, the Subscriber **111** may be conducting several advertising campaigns by publishing advertisements in local, regional, or national publications such as newspapers, magazines, or trade journals. In addition, the Subscriber **111** may have advertisements applied to billboards or the sides of trucks that travel the highways. The Subscriber **111** now wishes to determine the effectiveness of each of the several advertising campaigns. As a prerequisite, the Subscriber **111** engineered the several advertising campaigns such that each campaign promotes a unique directory number. In other words, each advertisement includes a different directory number to be called by those people for whom the advertisement was effective. Advertising different directory numbers is made simple through the use of the "800 number" services provided by many telecommunications companies, such as Fox Communications Corp. of Bellevue, Wash. With those services, the Subscriber **111** may secure several directory numbers which all direct calls to the Subscriber **111**. In this example, each of those directory numbers has an exchange code associated with the switch **109**. In that manner, each call to a calling number is directed to the switch **109** by the PSTN **103** before being connected to the Subscriber **111**. One of each of the directory numbers is used in each advertising campaign. The directory numbers associated with the advertising campaigns are referred to in this discussion as "campaign numbers."

[**0032**] The Caller **101** may wish to contact the Subscriber **111** at the campaign number when an advertising campaign has been effective. The Caller **101** initiates a call by providing the campaign number to the PSTN **103**. That call is routed through the PSTN **103** in the conventional manner described above. The call is eventually routed from the PSTN **103** to the switch **109**. The switch **109** directs the call to the Subscriber **111** so that the Subscriber **111** may service the Caller's request, comment, order, or the like. In addition, as described above, the switch **109** forwards calling information regarding the call to the data collector **113**. The calling infonnation is passed to the data collector **113** upon the termination of the call. The data collector **113** accumulates and stores the information passed from the switch **109**.

[**0033**] As mentioned above, the data collector **113** accumulates the calling information associated with all of the directory numbers serviced by the switch **109**. That task is typically performed for billing purposes to ensure that the calling party or the called party is appropriately billed for the call. In accordance with the invention, the data collector **113** also isolates the calling information related to campaign numbers. In other words, the data collector **113** includes a table identifying the campaign numbers. When calling information arrives regarding one of the campaign numbers in the campaign number table, the data collector **113** forwards that calling information (the "campaign information") to a web server **115**. The data collector **113** may forward the campaign information as it arrives or on a timed basis, such as in fifteen minute increments, one-hour increments, several-hour increments, or the like. The rate at which the campaign information is passed from the data collector **113** to the web server **115** limits how current a report may be. For that reason, the data collector **113** of the preferred embodiment is configured to provide the campaign information to the web server **115** in real-time, such as not later than a few hours after the campaign information becomes available at the data collector **113**. The web server **115** is described in greater detail below. The role of the web server **115** in the telecommunications system is described here.

[**0034**] The web server **115** receives the calling information associated with each campaign number (the campaign information) from the data collector **113** and stores that information on a permanent storage medium, such as a hard disk drive. The web server **115** tabulates the campaign information based on each campaign number. The table containing the campaign information is as current as the rate at which the data collector **113** provides the campaign information to the web server **115**. Consequently, the web server **115** is able to generate reports of the effectiveness of a campaign in real-time.

[**0035**] The web server **115** provides access to the tabulated data over the Internet **117**. Although the Internet is described as the preferred wide area network for making the reports available to subscribers, those skilled in the art will appreciate that any wide area network that allows access by subscribers to data stored on the web server **115** will benefit from the present invention. Accordingly, Subscriber **111** may access the web server **115** via a connection to the Internet **117**. The connection to the Internet **117** may be any con-

ventional connection that allows access to the web server **115**. For example, Subscriber **111** may access the web server **115** using TCP/IP and a conventional dial-up connection over a modem. Alternatively, the subscriber **111** may have a dedicated connection to the Internet **117** that provides constant access. The web server **115** may have a unique Hyper-Text Transfer Protocol (HTTP) address, a unique FTP address, or any other addressing scheme that allows the subscriber **111** to identify the web server **115**.

[**0036**] The web server **115** includes server software that allows the subscriber to request a report of a particular advertising campaign's effectiveness at any time. For example, the subscriber **111** may connect to the Internet **117** in the middle of the day on a Tuesday. At that time, Subscriber **111** may log on to the web server **115** using a secure access protocol and issue a request to the web server **115** to provide a report. The issued request identifies the particular advertising campaign of interest by campaign number. The web server **115** responds to the request by reading the data stored in the table of campaign information associated with the campaign number provided by the subscriber **111**. Software resident on the web server **115** tabulates the report in accordance with the subscriber's request. Finally, the web server **115** publishes, preferably in HTML format, the report to the subscriber. In this manner, the subscriber **111** is able to access and query the web server **115** as frequently as desired to determine the effectiveness of a particular advertising campaign. Individual elements of the system will be described next, followed by a discussion of exemplary advertising reports enabled by this embodiment of the invention.

[**0037**] Alternatively, the web server **115** may be configured to transmit the report to the subscriber at predetermined intervals, such as immediately, hourly, daily, weekly, or the like. For instance, software may be configured to simulate a subscriber request and cause the web server **115** to generate and transmit the report to the subscriber **111**. Alternative means of delivery may also be employed, such as via electronic mail. These and other alternatives will become apparent to those skilled in the art upon a study of the disclosed embodiments.

[**0038**] In another embodiment, the web server **115** may be configured to generate the report in response to a triggering event. Examples of such a triggering event may be an attempted call that received either no answer or a busy signal, or the situation where calling activity to one campaign number exceeds or fails to exceed a predetermined threshold, or the like. For instance, the web server **115** may be configured to analyze the campaign information as it is received from the data collector **113**. If the campaign information reflects that a call to a campaign number resulted in either a busy signal or no answer, the web server **115** may respond by issuing a flag to the subscriber **111**. In one embodiment, the web server **115** may be configured to extract from the campaign information the calling party's directory number and transmit that directory number directly to the subscriber **111** or someone associated with the subscriber to respond to the missed call. The directory number may be transmitted by digital or voice pager, by e-mail message, by human interaction, or by any other mechanism for alerting the subscriber **111**. In that manner, the subscriber **111** can be immediately notified that a potential customer was unable to complete a call, and be provided that potential customer's directory number in order for the subscriber **111** to return the call, rather than hope the customer calls again. Those skilled in the art will see the enormous benefits created by this aspect of the invention over existing technologies.

[**0039**] Moreover, it is not essential to the present invention that the campaign numbers be associated with the switch **109**. For example, the subscriber **111** may have existing service with a telecommunications company that operates the LEC **107**, which is not capable of providing the reporting service described herein. However, the campaign numbers for the subscriber's advertising campaign have exchange codes associated with the LEC **107** rather than the switch **109**. In that situation, the switch **109** may be configured to gather the calling information from the LEC **107**. For example, the LEC **107** may also contain a telecommunications switch similar to switch **109**. The LEC **107** may read and store calling information associated with any calls made to directory numbers that route to the LEC **107**. Calling information associated with campaign numbers that route to the LEC **107** may be gathered and transmitted to an LEC receiving server **112** over a communications link **110**. The calling information gathered at the LEC **107** may additionally contain a name associated with the calling party and a zip code associated with the calling party. The transmission of the calling information from the LEC **107** to the LEC receiving server **112** may occur as a batch transfer at a predetermined time, such as daily or nightly, or the LEC **107** may be configured to transmit the calling information more frequently, even on a per-call basis. Once the LEC receiving server **112** has gathered any calling information transmitted from the LEC **107**, that information is passed to the web server **115** and normal operation resumes as described above.

[**0040**] **FIG. 2** is a functional block diagram of the data collector **113** illustrated in **FIG. 1**. The data collector **113** receives the calling information from the switch **109** associated with every call made. The data collector **113** has a communications driver **201** that is responsible for lower level communications with other data processing equipment, such as the switch **109** and the web server **115**. The communications driver **201** receives the information from the switch **109** and passes it to a sorter engine **203**. The sorter engine **203** is a software application resident on the data collector **113** and is responsible for tabulating the information received from the switch **109**. The sorter engine **203** creates a database **205** with all of the calling information provided by the switch **109**.

[**0041**] A second database **207** may reside on the data collector **113** and contain a list of the campaign numbers. The sorter engine **203** parses from the first database **205** that information corresponding to the campaign numbers. To do so, the sorter engine **203** compares the campaign numbers from the second database **207** with the information stored in the database **205** and retrieves the information associated with each of the campaign numbers (the campaign information). The sorter engine **203** may be configured to retrieve the campaign information from the database **205** at preselected time intervals, or, alternatively, the sorter engine **203** may be configured to identify the campaign information as the information is being written to the database **205**.

[**0042**] The campaign information is then forwarded to the web server **115** via the communications driver **201**. Those

skilled in the art will appreciate that the campaign information may be temporarily stored or buffered at the data collector **113** during the parsing operation for later transmission to the web server **115**.

[**0043**] The LEC receiving server **112** may perform functions similar to those performed by the data collector only for information received from the LEC **107**. Those skilled in the art will appreciate that the LEC receiving server **112** may incorporate all or a subset of those components described with respect to the data collector **113**.

[**0044**] **FIG. 3** is a functional block diagram of the web server **115** illustrated in **FIG. 1**. The web server **115** is a conventional data processing computer that includes software and hardware for interfacing with the data collector **113**, the LEC receiving server **112**, and the Internet **117** or other wide area network. That software includes a communications driver **301** for controlling the flow of information with the data collector **113**, the LEC receiving server **112**, and the Internet **117**. In addition, the web server **115** includes a server software **303**, which is software for making information stored on the web server **115** available to users of the Internet **117**.

[**0045**] The web server **115** receives the campaign information from the data collector **113** or the LEC receiving server **112** and stores it in a campaign database **307**. The campaign database **307** includes the calling information for each call placed or attempted to each campaign number. The information may be sorted within the campaign database **307** by campaign number if a subscriber maintains multiple campaign numbers. It should be noted that the web server **115** is not limited to a single campaign database **307**. There may be multiple campaign databases **307**, one for each subscriber or campaign number. Alternatively, one campaign database **307** may include the campaign information for all subscribers, with each campaign number being associated with the appropriate subscriber.

[**0046**] The server software **303** is configured to interface with the subscriber over the Internet **117** via the communications driver **301**. For example, web page information (not shown) may reside on the web server **115**, including HTML files readable by a web browser at the subscriber's location **111**. The server software **303** is configured to respond to access by the web browser at the subscriber location **111** by presenting the HTML files as web pages having input screens and the like. The subscriber **111** provides, via the input screens, information requesting a report on the effectiveness of an advertising campaign. The server software **303** may respond to the subscriber's request by executing small programs, or "scripts," that retrieve the relevant campaign information from the campaign database **307**. The scripts execute at the web server **115** and perform tasks such as invoking the report formatter **305** and passing parameters to the report formatter **305** identifying the particular input provided by the subscriber.

[**0047**] Other software (not shown) resident on the web server **115** may be configured to query the campaign information as it is received by the web server **115** to watch for triggering events, such as a call that results in a busy signal or no answer. If a triggering event is noticed, the software may respond by generating an alert to be transmitted to the subscriber **111**. For instance, the web server **115** may include a voice-capable modem **319** or other telecommunications equipment connected to the PSTN **103**. In response to a notice that a call to a campaign number resulted in a busy signal, the web server **115** may generate and transmit, via the modem **319**, a paging message, including the calling party's directory number, to a predetermined directory number associated with the subscriber. Electronically issuing paging messages is known generally in the art. In this manner, the subscriber **111** may be immediately notified that a potential customer was unable to get through to the subscriber **111**, and the call can be returned. The alert may be transmitted to the subscriber **111** in many other forms as well, such as by e-mail message via the Internet **117**, or the like.

[**0048**] The report formatter **305** is a software program configured to retrieve the campaign information from the campaign database **307** and arrange it in accordance with the particular report selected by the subscriber **111**. The report formatter **305** may be a database engine configured to query the campaign database **307** for the campaign information associated with the campaign number selected by the subscriber **111**. The report formatter **305** is also configured to arrange the campaign information according to a particular report format identified by the subscriber. For example, the subscriber **111** may request a report on the number of calls attempted to a campaign number but which resulted in either a busy signal or no answer. Within the campaign database **307**, the campaign information indicates whether a particular call resulted in a busy signal or no answer. Accordingly, the report formatter **305** retrieves from the campaign database **307** each record associated with the selected campaign number and that resulted in either a busy signal or no answer. Those records are then assembled into a tabular report and presented to the server software **303** for publication to the subscriber **111** via the Internet **117**.

[**0049**] Also resident on the web server **115** may be additional databases, such as a Local Exchange Routing Guide (LERG) database **311**. The LERG database **311** associates telephone numbers with particular information about the telephone number. For example, the LERG database **311** may describe whether the calling party's directory number originated at a cellular phone or at a land-line based phone. The LERG database **311** additionally identifies a particular LEC for the calling party. Another database may provide the approximate longitude and latitude for the area code/exchange represented by the first 6 digits of the calling party's directory number. By cross referencing that geographic information with a "zip-code database" (not shown) having zip codes associated with geographic information, the likely zip code of the Caller **101** can be identified. The zip-code database **311** is a weighted database because there is not a direct correlation between calling numbers and zip codes. Accordingly, the zip-code database **311** provides a statistical estimate of the zip code of each calling number based on the probability that the NPA-NXX of the calling number is within a particular zip code. It should be noted that calling information received from the LEC **107** at the LEC receiving server **112** may directly identify the zip code of the calling party.

[**0050**] The system described above enables the Subscriber **111** to access the web server **115** at any desired time and request a report on the effectiveness of an advertising campaign. The report provided reflects calls made to the selected campaign number as recently as within a few hours. This information allows subscribers of the service to direct

their advertising resources to only those advertising campaigns that achieve results. In addition, because the system provides real-time information, the reports may be used to improve customer support. For example, the Subscriber **111** may request frequent reports on calls attempted but not completed to a campaign number, such as calls reaching a busy signal or no answer. Based on those reports, the Subscriber **111** may return calls to those potential customers that were unable to initially reach the Subscriber **111**. In this manner, lost sales may be recovered without having to rely on the potential customer attempting a second call. The inherent benefits of this feature will be apparent to those familiar with advertising and lost sales due to insufficient salespeople to handle peak call traffic.

[**0051**] Processes Employed by One Embodiment

[**0052**] **FIGS. 4, 5A**, and **5B** are flow charts that, taken in conjunction with the system illustrated in FIGS. **1-3**, describe processes employed by one embodiment of the invention to provide reports on the effectiveness of an advertising campaign in real-time. The processes begin in **FIG. 4** at starting block **401** where a caller desires to place a call to a campaign number identified in an advertisement placed by a subscriber of the reporting service. From starting block **401**, processing proceeds to block **403**.

[**0053**] At block **403**, the switch **109** receives an indication that a call is being attempted. The indication comes from the PSTN **103** in the conventional manner, such as by a data message transmitted by the AIN portion of the PSTN **103**. The data message includes information about the attempted call, including the directory numbers of both the calling party and the called party. Processing then proceeds to block **405**.

[**0054**] At block **405**, the switch **109** connects the call to the location identified by the called party's directory number. Once the call is connected, the calling party and the called party may communicate. Processing resumes at block **407**.

[**0055**] At block **407**, the switch **109** forwards calling information related to the call to the data collector **113** at the termination of the call. The calling information includes at least the calling party's directory number, the called party's directory number, whether the call was connected, whether the call reached a busy signal or no answer, and the length of the call if connected. The data collector **113** stores the calling information in a database, and processing resumes at decision block **409**.

[**0056**] At decision block **409**, the data collector **113** determines whether the call is associated with a campaign number. The data collector **113** may compare the called party's directory number from the calling information to a database of campaign numbers to make that determination. If the call is not to a campaign number, processing returns to starting block **401** where the system idles and awaits another call. If the call is to a campaign number, processing proceeds to block **411**.

[**0057**] At block **411**, the data collector **113** extracts the calling information associated with the call to the campaign number from the calling information database. As mentioned above, the data collector **113** may alternatively identify the calling information as related to a campaign number contemporaneously with storing it in the calling information database. In that case, extracting the calling information from the database would be unnecessary. Once the data collector **113** has identified the calling information associated with a campaign number (the campaign information), processing proceeds to block **413**.

[**0058**] At block **413**, the data collector **113** forwards the campaign information associated with the campaign number to the web server **115**. The data collector **113** may forward the campaign information as it is received from the switch **109**. Alternatively, the data collector **113** may identify the campaign information in the calling information database when received, but forward the campaign information at specified time intervals, such as hourly or every few hours. Processing continues at block **415**.

[**0059**] At block **415**, the web server **115** tabulates the campaign information received from the data collector **113**. The web server **115** maintains a database of the campaign information associated with each campaign number (the campaign database **307**). The campaign database **307** reflects all the campaign information currently available at the web server **115**. In this manner, the web server **115** is configured to provide reports based on the campaign information as well as certain other databases that may supplement the campaign database **307**.

[**0060**] FIGS. **5A-5B** are flow charts illustrating a process for causing the web server **115** to generate a report based on the campaign information. The process begins at starting block **501**, where a subscriber **111** desires to generate a particular report on the effectiveness of an advertising campaign undertaken by the Subscriber **111**. The Subscriber **111** has a connection to the Internet **117** over which access to the web server **115** can be made. Processing continues at block **503**.

[**0061**] At block **503**, the web server **115** receives a request from the Subscriber **111** for the particular report. The request may indicate that a report on the total number of calls made to a particular campaign number is requested. Or the request may indicate that the Subscriber desires a report of all the calls made to the campaign number that resulted in no answer or a busy signal. Moreover, the request identifies a particular campaign number or numbers to include in the report. After the web server **115** receives the request from the Subscriber **111**, processing proceeds to block **505**.

[**0062**] At block **505**, the web server **115** invokes the report formatter **305**. The report formatter **305** is configured to formulate many different types of reports, including the report requested by the Subscriber **111**. The report formatter **305** receives from the web server **115** a parameter defining the particular report requested by the Subscriber **111**, including the specified campaign number. Processing proceeds to block **507**.

[**0063**] At block **507**, the report formatter **305** accesses the campaign database **307** and retrieves the relevant campaign information for the campaign number specified in the Subscriber's request. The relevant campaign information may be all of the campaign information associated with the selected campaign number, or it may be only a portion of the available campaign information. Processing proceeds to decision block **509**.

[**0064**] At decision block **509**, the report formatter **305** determines whether additional databases are required to

prepare the selected report. For instance, if the Subscriber **111** requested a report of the zip codes from which calls were placed during the advertising campaign, an additional database would be necessary to prepare the report. Other situations where additional databases might be required will be apparent to those skilled in the art. If no additional databases are necessary, processing proceeds to block **513**. If additional databases are required to prepare the report, processing proceeds to block **511**.

[**0065**] At block **511**, the report formatter **305** accesses the needed additional database to retrieve the information necessary to prepare the selected report. For example, if the Subscriber **111** requested a zip-code based report, the report formatter **305** may access a zip code database (not shown) to retrieve information to prepare that report. Those skilled in the art will appreciate that many additional databases may be used to supplement the databases described here, and the invention is not limited to the examples provided. Examples of other such databases include property tax databases, motor vehicle records databases, census information databases, voter registration databases, and the like. After the report formatter **305** has retrieved the necessary information from any additional databases, processing proceeds to block **513**.

[**0066**] At block **513**, the report formatter **305** formulates the selected report based on the campaign information retrieved at block **507** and any additional information retrieved at block **511**. Formulating the report may involve simply tabulating the retrieved information, or additionally, formulating the report may involve cross referencing the campaign information with information retrieved from additional databases. Moreover, formulating the report may involve analyzing the campaign information to generate statistics on the callers reflected in the campaign information. For example, the report formatter **305** may analyze the NXX prefixes of each directory number reflected in the campaign information and compare that data to information retrieved from another database, such as the LERG database **311**, that identifies whether the directory number relates to a conventional telephone service subscriber or to a cellular telephone service subscriber. Formulating reports of this kind provides important demographic information to the Subscriber **111**. Examples of particular types of reports are provided below. After the report formatter **305** has formulated the report, processing proceeds to block **515**.

[**0067**] At block **515**, the report formatter **305** provides the report to server software **303** resident on the web server **115**. The server software **303** then formats the report for transmission over the Internet **117**. The server software **303** may create a HyperText Markup Language ("HTML") file which is capable of being read by a conventional web browser. Those skilled in the art will appreciate that the functions performed in blocks **513** and **515** are not necessarily performed serially. In other words, the report formatter **305** and the server software **303** may act in unison to concurrently perform both the functions of formulating the report and formatting the report for transmission over the Internet **117**. For clarity only, those two functions have been separately described. With the report properly formatted for transmission over the Internet **117**, processing proceeds to block **517**.

[**0068**] At block **517**, the web server **115** publishes the advertising effectiveness report to the Subscriber **111** over the Internet **117** in the conventional manner. Processing then terminates at ending block **519**.

[**0069**] **FIG. 6** is a flow chart illustrating a process employed by one embodiment of the present invention for alerting the subscriber **111** that a triggering event has occurred. The process of **FIG. 6** is preferably performed by software resident on the web server **115**. However, many alternatives are envisioned for a mechanism to perform the process of **FIG. 6**, such as by hardware resident on the web server **115**, by software or hardware resident on the data collector **113**, or by a separate computer or data processing equipment connected to the switch **109**, the data collector **113**, or the web server **115** and being dedicated to the function of monitoring the calling information for triggering events. The process begins at starting step **601** where the system described above is operational and calling information is being gathered by the data collector **113** and forwarded to the web server **115**. The process continues at block **603**.

[**0070**] At block **603**, the campaign information is monitored for triggering events. This example describes the situation where the triggering event is a call to a campaign number that resulted in either a busy signal or no answer. Other triggering events may include the amount of calling activity to the campaign or a particular campaign number exceeding a given threshold, a certain number of calls (i.e., every hundredth call or the like) being attempted or completed, or a call from a predetermined calling number. Many other triggering events will become apparent to those skilled in the art based on a study of this disclosure. At decision block **605**, processing returns to block **603** until a triggering event is encountered. When a triggering event is encountered, processing proceeds to block **607**.

[**0071**] At block **607**, an alert is issued in response to the triggering event. As discussed above, the alert may take the form of an electronic paging message to the subscriber **111** or an entity responsible for the advertising campaign. If the triggering event was a busy signal or an unanswered call, the paging message should include the calling party's directory number. In that manner, the subscriber **111** is provided the opportunity to immediately return the call to the potential customer. Of course, alternative mechanisms may be employed for issuing the message to the subscriber **111**, such as by e-mail, voice mail, human interaction, or the like. After the alert is issued to the subscriber **111**, processing returns to block **603** where the campaign information is again monitored.

[**0072**] Exemplary Advertising Effectiveness Reports

[**0073**] Those skilled in the art will appreciate that many types of reports may be generated by the above described embodiments of the invention. By way of example only, particular reports that can be generated by the embodiments described above include:

[**0074**] Percentage of Calls Per Campaign: This report provides the Subscriber with comparative information between campaigns. The report identifies the percentage of the total calls to the Subscriber associated with each campaign. This report allows the Subscriber to identify those advertising mechanisms that are most effective.

[**0075**] Total Calls Per Campaign: This report provides the Subscriber with a total number of calls to each campaign

number. This report may include the calling information for each of the calls to a campaign number. The Subscriber can use this information to determine the per-dollar effectiveness of the campaign by comparing the total number of calls to the amount of money spent on the campaign.

[0076] Average Calls Per Day: This report provides the Subscriber with per-day totals of calls made to either a particular campaign number or to all the campaign numbers. The Subscriber can use this report to easily identify those days with the heaviest call traffic for support planning purposes.

[0077] Average Call Duration: This report provides the Subscriber with a length of time that the average call to a campaign number lasts. This information is useful to the Subscriber when planning the number of support personnel to dedicate to a campaign.

[0078] RNA/Busy: This report provides the Subscriber with a listing of the calls that either were not answered (RNA) or received a busy signal. This information allows the Subscriber to attempt and recover lost sales. The Subscriber may provide this report to particular support personnel with the task of returning those calls and attempting to satisfy whatever needs the callers may originally have had.

[0079] Demographic Reports: The system described above is capable of providing demographic reports as well. For example, the calls made to a campaign number may be tabulated by area code directly to provide the Subscriber with a broad overview of geographic locations responding to a campaign. Additional databases may be used to more specifically identify geographic regions responding to a campaign. Additional databases, such as those available from Census information, may be employed to generate financial, ethnic, and age-related demographic information which may be of use to the Subscriber.

[0080] While the preferred embodiment of the invention has been illustrated and described, it will be appreciated that various changes can be made therein without departing from the spirit and scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A system for monitoring and reporting on the effectiveness of an advertising campaign identified by a campaign number, comprising:

a telecommunications switch compatible with a Signaling System 7 protocol and configured to extract calling information associated with a call directed to a directory number associated with the telecommunications switch, the telecommunications switch further configured to forward the calling information to a data recorder;

the data recorder being configured to store the calling information and to parse campaign information from the calling information, the campaign information comprising calling information associated with a call to the campaign number, the data recorder being further configured to forward the campaign information to a web server;

the web server being configured to accumulate the campaign information and to forward the campaign information over a wide area network in response to a request for the campaign information associated with the campaign number.

2. The system of claim 1, wherein the calling information includes a calling party directory number associated with the party initiating the call.

3. The system of claim 1, wherein the calling information includes an indication that the call received a busy signal when an attempt was made to connect the call to the directory number.

4. The system of claim 1, wherein the calling information includes an indication that the call was not answered.

5. The system of claim 1, wherein the calling information includes a date and time of day that the call was initiated.

6. The system of claim 1, wherein the calling information includes a duration indicating the length of time the call was connected.

7. The system of claim 1, wherein the data recorder is further configured to forward the campaign information to the web server upon the completion of the call.

8. The system of claim 1, wherein the data recorder is further configured to forward the campaign information to the web server at a specified time interval.

9. The system of claim 8, wherein the specified time interval is less than monthly.

10. The system of claim 9, wherein the specified time interval is less than daily.

11. The system of claim 1, wherein the web server is further configured to formulate a report based on the campaign information in response to the request for the campaign information.

12. The system of claim 11, wherein the report comprises a listing of attempted calls to the directory number that resulted in a busy signal.

13. The system of claim 11, wherein the report comprises a listing of attempted calls to the directory number that were not answered by the called party.

14. The system of claim 1, wherein the wide area network is the Internet.

15. The system of claim 1, wherein the web server is further configured to formulate a report based on the campaign information at predetermined time intervals.

16. The system of claim 1, wherein the web server is further configured to formulate a report based on the campaign information in response to a triggering event.

17. A method of reporting the effectiveness of an advertising campaign using a telecommunications system for connecting a call from a calling party to a called party, comprising:

accumulating calling information associated with a selected directory number;

in response to a request for a report, formulating the report based on the accumulated calling information for the selected directory number;

formatting the report for transmission over the Internet; and

transmitting the formatted report over the Internet to an entity associated with the advertising campaign.

18. The method of claim 17, wherein the accumulating occurs substantially continuously and the report includes the last calling information accumulated.

19. The method of claim 17, wherein the calling information is accumulated in a campaign database stored on a web server accessible over the Internet.

20. The method of claim 19, wherein formulating the report comprises accessing the campaign database to retrieve the calling information associated with the selected directory number and tabulating the calling information in accordance with the request for the report.

21. The method of claim 17, wherein formatting the report comprises converting the report to a HyperText Markup Language readable by a web browser.

22. The method of claim 17, wherein the report comprises a listing of calls attempted to the selected directory number which reached a busy signal.

23. The method of claim 17, wherein the report comprises a listing of calls attempted to the selected directory number which were not answered.

24. The method of claim 17, wherein the report comprises a geographical indication of the location from which the call was initiated.

25. The method of claim 24, wherein the geographical indication is a zip code.

26. The method of claim 17, wherein the formatted report is transmitted over the Internet as electronic mail.

27. A method of reporting the effectiveness of an advertising campaign using a telecommunications system for connecting a call from a calling party to a called party, comprising:

monitoring calling information associated with a selected directory number;

in response to the occurrence of a triggering event, generating an alert associated with the calling information; and

transmitting the alert to an entity associated with the advertising campaign.

28. The method of claim 27, wherein the triggering event includes an attempted call to the selected directory number that resulted in no answer.

29. The method of claim 27, wherein the triggering event includes an attempted call to the selected directory number that resulted in a busy signal.

30. The method of claim 27, wherein transmitting the alert comprises issuing a paging message to the entity associated with the advertising campaign.

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