A method and system for providing advertising effectiveness searching capabilities, predictive modeling capabilities and usage mining in a location-based services system is disclosed. During operation of the location-based services system, usage information for advertising campaigns placed on the location-based services system is stored. Advertisers are provided with the ability to enter a search request form on a remote terminal to mine the usage information. The search request is then transmitted to an application that searches usage information to generate a response to said search request.
METHOD FOR PASSIVE MINING OF USAGE INFORMATION IN A LOCATION-BASED SERVICES SYSTEM


FIELD OF THE INVENTION

[0002] The present invention relates generally to providing information to communication devices and, more particularly, to a system and method for passive mining of usage information in a location-based services system.

BACKGROUND OF THE INVENTION

[0003] Wireless communication devices have recently evolved from a technology used by an elite segment of the population to a technology that is used by the masses. In the year 2000, it has been estimated that well over 100 million people in the United States alone subscribed to at least one type of wireless communication service. Worldwide, the number of wireless communication device users has reached a staggering number and is growing all of the time. In the near future, it is envisioned that almost everyone will own or use some sort of wireless communication device that is capable of performing a variety of functions.

[0004] In addition to traditional wireless communication devices, many different types of portable electronic devices are in use today. In particular, notebook computers, palm-top computers, and personal digital assistants (PDA) are commonplace. The use of wireless communication devices is widespread and it is expected that in the near future combined mobile telephone/PDA devices will be widely used by the masses. Currently, most of these devices are only used by a small segment of the population due, in large part, to the fact that there are a limited number of applications and services available for such devices.

[0005] The Internet has become a widely used medium for providing business information in a variety of forms that are targeted to various types of individuals and businesses. Generally speaking, one of the problems associated with searching for business information on specific products and services using the Internet is being able to locate relevant business information for products and services that are available in a geographic area that is located near the user. As such, a need exists for a way to provide a broad range of business information and content to wireless communication devices and workstations that are based on the respective geographic location of the communication device at the time the information is requested.

[0006] Users of several different types of remote terminals often desire to use directory assistance services that are provided by various telephone companies. Many of these directory assistance calls originate in a respective metropolitan telephone service area and request listing information for listings contained in the same metropolitan service area. Most local directory assistance services in use today are handled by an operator that assists the requestor by manually inputting the requested information into an application that searches a database containing residential and business listings. As such, a need exists for providing an enhanced directory assistance system that is capable of automatically providing geographically targeted responses to requestors.

[0007] Another need exists for methods and systems that allow business users of these types of systems to search through historical usage records. These records can be used by business users for various types of research and record keeping.

SUMMARY OF THE PRESENT INVENTION

[0008] A preferred embodiment of the present invention discloses a method for providing advertising effectiveness searching capabilities in a location-based services system. In the preferred embodiment, usage information for advertising campaigns placed on the location-based services system is stored in a usage data database. A search request form containing at least one input field is generated on a remote terminal. A search request is then entered into the search request form with the remote terminal. The search request is then transmitted to an advertising effectiveness application that is preferentially located on an advertiser portal that is connected to the location-based services system. The usage information is then searched to generate a response to the search request and the response is then transmitted to the remote terminal.

[0009] In the preferred embodiment, the usage information may be selected from a group of information including a time of access, a location of access, an identity of individuals who received a respective advertising campaign, a total number of people who received a respective advertising campaign, a total number of people who responded to a respective advertising campaign, a time and date a respective advertising campaign was run, a product listing for a respective advertising campaign and a service listing for a respective advertising campaign.

[0010] The search request form is preferentially generated on a web browser located on the remote terminal. A usage analysis user interface application generates the search request form and then transmits it to the remote terminal via the advertiser portal. The search results that are obtained from the usage data database may be formatted into viewable segments with a data scoring application. The usage analysis user interface application is preferentially used to transmit the response to the remote terminal. The remote terminal can be a wireless communication device in some preferred embodiments.

[0011] Another preferred embodiment of the present invention discloses a method for providing predictive modeling in a location-based services system. Predictive modeling allows users to forecast or predict the types of users and numbers of users that are likely to respond to or receive advertising campaigns based on historical records that are contained in a usage data database. In this embodiment, an advertising campaign is created with a remote terminal. The advertising campaign is then transmitted to a predictive modeling application that is preferentially located on an advertiser portal. A profile data file and a usage data database are then searched to generate a predictive model for the advertising campaign and the predictive model is then transmitted to the remote terminal.

[0012] In this preferred embodiment, the advertising campaign that has been created includes at least one business rule. The business rule is extracted with a business rule application.
that is located on the advertiser portal and is used to assist in searching the profile data files and the usage data database. A usage analysis user interface application is used to generate the sample advertising campaign. In the preferred embodiment, the predictive model is formatted in a viewable format using a data scoring application. The predictive model is preferentially transmitted to the remote terminal using a usage analysis user interface application. The remote terminal may be a wireless communication device in other embodiments of the present invention.

0013 Another preferred embodiment of the present invention discloses a method for searching usage information in a location-based services system. In this embodiment, usage information for the location-based services system is stored in a usage data database. An advertiser portal is provided to a remote terminal. A search request form is generated on the remote terminal that allows the user to generate a search. The user may then input a search request into the search request form using the remote terminal that is transmitted to the advertiser portal. The usage data database is then searched to generate a response to the search request that is transmitted to the remote terminal.

0014 In this preferred embodiment, the search request form is generated with a usage analysis user interface application located on the advertiser portal. The search results are preferentially formatted into a viewable format with a data scoring application. The response is transmitted to the remote terminal with a usage analysis user interface application on the advertiser portal. The remote terminal may be a wireless communication device.

0015 Further objects and advantages of the present invention will be apparent from the following description, reference being made to the accompanying drawings wherein preferred embodiments of the invention are clearly illustrated.

BRIEF DESCRIPTION OF THE DRAWINGS

0016 FIG. 1 illustrates a preferred embodiment of the location-based services system.

0017 FIG. 2 is a flow chart illustrating the process steps performed by the location-based application server when processing structured requests.

0018 FIG. 3 illustrates a preferred method for searching usage information in a location-based services system.

0019 FIG. 4 illustrates a preferred advertising effectiveness application for a location-based services system.

0020 FIG. 5 illustrates a preferred predictive modeling application for a location-based services system.

DETAILED DESCRIPTION OF THE PRESENTLY PREFERRED EMBODIMENTS OF THE INVENTION

0021 The present invention discloses a method and system for delivering location-based services through a variety of communication networks. Referring to FIG. 1, the preferred location-based services system 10 uses the geographic location of a remote terminal 12 to provide geographically targeted services to the remote terminal 12. Remote terminals 12 that subscribe to the location-based services system 10 are capable of selecting and receiving information from a broad range of business and service providers that are located in a geographic region that is close to the remote terminal 12 and, thus, the user.

0022 As illustrated in FIG. 1, one preferred embodiment of the location-based services system 10 includes a remote terminal 12 that is connected to a wireless communication system 14 via a base station 16. The preferred embodiment may be used to make-up the preferred wireless communication system 14. Ideally, the preferred wireless communication system 14 would cover a wide geographic region, such as, by way of example only, the entire United States.

0023 In the preferred embodiment of the present invention, the remote terminal 12 is capable of sending a digital input signal to the base station 16. The term digital input signal should be broadly construed to include voice signals, keypad input data, and pointer device selections or data from any other commonly used means for inputting data into a respective remote terminal 12. Those skilled in the art would recognize that several peripheral devices are available for various types of remote terminals 12 that could be used to input data into the remote terminals 12 and may be taken advantage of by the present invention.

0024 Preferentially, the wireless communication system 14 is a digital communication system that uses one or more of several different methods of providing wireless digital communication between the remote terminals 12 and the base stations 16. The wireless communication system 14 can use frequency division duplexing (FDD) or time division duplexing (TDD) to allocate the two directions of transmission between the remote terminal 12 and the base station 16.

0025 In order to provide multiple access methods to the remote terminals 12, which refers to the method of creating multiple channels for each transmission direction, one of several different types of multiple access methods may be used in the present invention. Three preferred types of multiple access methods that might be used include: frequency division multiple access (FDMA); time division multiple access (TDMA); and code division multiple access (CDMA). Those skilled in the art would recognize that the present invention could readily be adapted to take advantage of other multiple access methods as well.

0026 As further illustrated in FIG. 1, the preferred embodiment of the present invention the base station 16 of the wireless communication system 14 is connected to a public switched telephone network (PSTN) 18 by a public switch 20. As known to those skilled in the art, the PSTN 18 is a worldwide voice telephone network that is used to allow various communication devices to communicate with each other. Although the preferred PSTN 18 is a digital system, the present invention may be adapted for use on analog systems as well to accommodate geographic regions that might be underdeveloped or not serviced by a digital system.

0027 The public switch 20 transfers the signals that are received from the base station 16 to a private branch exchange (PBX) 22. The public switch 20 is connected to the private branch exchange (PBX) 22, which, as generally known in the art, is a telephone switching system that is used to interconnect various telephone extensions to each other. In the preferred embodiment of the present invention, the PBX 22 uses all-digital methods for switching and is capable of supporting digital remote terminals and telephones and analog remote
terminals and telephones. As set forth in greater detail below, in the preferred embodiment, the PBX 22 is connected to a server of the location-based services system 10, which is a form of a digital remote terminal.

[0028] Referring to FIG. 1, in this embodiment of the present invention, the PBX 22 is connected to at least one voice recognition server 24. The voice recognition server 24 contains at least one voice recognition application that is operable to recognize the respective words that are contained in the voice signals that are received from the PBX 22. As set forth in greater detail below, a resulting output is generated by the voice recognition application that is used by a natural language processing application.

[0029] The voice recognition server 24 is connected to at least one natural language processing server 26 that includes at least one natural language processing application that processes the identified words contained in the voice signals to ascertain the meaning of the words that are contained in the voice signals. As such, during operation, the voice recognition server 24 identifies or recognizes the particular words that are contained in the voice signals and the natural language processing server 26 interprets the meaning of the recognized words of the voice signals that are originally generated from the remote terminal 12. The natural language processing application may be located on the voice recognition server 24 in other embodiments of the present invention, but, in an effort to increase the level of performance, would preferentially be located on a separate server or a separate set of servers.

[0030] The natural language processing server 26 is connected to at least one location-based application server 28. As set forth in detail below, the location-based application server 28 is programmed to provide responsive information to the remote terminals 12 that has been requested by a respective user of the remote terminal 12. Generally speaking, the location-based application server 28 is used to retrieve and pass on location-based information to the remote terminals 12 in various data formats. The type of information provided to the remote terminals 12 varies depending on the specific nature of the information that has been requested from the user and the geographic location of the remote terminal 12.

[0031] During operation, after the meaning of the words in the voice signals are interpreted, the natural language processing server 26 is programmed to create a structured request that is sent to the location-based application server 28. In response to the structured request, the location-based application server 28 generates a structured response that is sent to the remote terminal 12. As set forth in greater detail below, the exact nature of the information sent in the structured response depends on the specific request that is made by a particular user of the remote terminal 12.

[0032] If an analog voice signal is used, although not illustrated in FIG. 1, at least one digital signal processor server could be used to convert the analog signal into a digital signal that the voice recognition server 24 can process and interpret using the voice recognition applications. In this respective embodiment, the digital signal processor server is preferentially connected between the voice recognition server 24 and the PBX 22. Those skilled in the art would recognize that the voice recognition server 24 might also be designed to perform the functions of the digital signal processor server in other embodiments of the present invention.

[0033] Each remote terminal 12 also sends a unique remote terminal identifier to the base station 16 while communicating with the base station 16 of the wireless communication system 14. The remote terminal identifier is preferentially attached to each voice signal as it passes through the location-based services system 10 so that the system can keep track of which respective remote terminal 12 is supposed to receive the information that has been requested. Those skilled in the art would recognize that various identification methods might be used to keep track of specific remote terminals 12 using the location-based services system 10.

[0034] As further illustrated in FIG. 1, the location-based application server 28 is also connected to a location gateway server 30, which is, in turn, connected to the base station 16 of the wireless communication system 14. The location gateway server 30 is used by the location-based application server 28 to retrieve a geographic indicator that is associated with each respective remote terminal 12. As such, while a respective remote terminal 12 is connected to the wireless communication system 14, the location-based application server 28 is capable of determining the respective geographic location of the remote terminal 12 so that geographically targeted responses and information can be provided to the remote terminal 12.

[0035] As illustrated in FIG. 1, the location gateway server 30 is preferentially connected to the base station 16 of the wireless communication system 14 using a network connection 32, which may be a private network connection or an Internet connection in alternative embodiments of the present invention. The geographic indicator may be generated by the remote terminal 12 or the base station 16 and is preferentially transmitted to the location-based application server 28 when a user of the remote terminal 12 is accessing the location-based services system 10. The geographic indicator is preferentially transmitted to the location-based application server 28 with the remote terminal identifier so that the location-based application server 28 can associate each respective remote terminal 12 with a particular geographic location.

[0036] In the preferred embodiment of the present invention, the geographic indicator may be preset by a user of the remote terminal 12, automatically generated by a GPS located in the remote terminal 12 or generated by a specialized geographic determination application running on the base station 16. In addition, the present invention may advantageously take advantage of an enhanced 911 system of the wireless communication system 14 to generate the geographic indicator. In another embodiment of this invention, the geographic indicator may originate from a combination of these sources and/or systems (i.e., it could come from a GPS-assisted network that uses GPS and devices on the network). The geographic indicator may automatically be sent to the location-based application server 28 as soon as a respective remote terminal 12 connects to the wireless communication system 14; however, in alternative embodiments of the present invention, the geographic indicator is only sent when a respective remote terminal is sending a structured request to the location-based application server 28. As the geographic location of the remote terminal 12 changes, the geographic indicator is updated and the updated information can continuously be sent to the location-based application server 28.

[0037] As further illustrated in FIG. 1, at least one voice synthesis server 33 is connected to the location-based application server 28 and the PBX 22. For voice-related applications of the location-based services system 10, the voice synthesis server 33 is used to generate voice responses that are based on the structured responses that are generated in
response to the structure requests that are received by the location-based application server 28. Voice synthesis applications on the voice synthesis server 33 are used to transform the structured responses into voice response. In the preferred embodiment, the PBX 22 is used to transmit the voice responses to the PSTN 18, which, in turn, transmits the voice response to the base station 16, which ultimately transmits the voice response on to the remote terminal 12. In alternative embodiments of the present invention, the voice synthesis server 33 may be connected directly to respective base stations 16 of the wireless communication system 14.

[0038] Referring once again to FIG. 1, in yet another preferred embodiment of the present invention, the remote terminal 12 is connected to the location-based application server 28 through a wireless application protocol (WAP) gateway 34 of the wireless communication system 14. The WAP gateway 34 is connected to a WAP server 38 of the location-based services system 10 through a network connection 36. The network connection 36 may be a private network connection, or an Internet connection. The WAP server 38 is connected to the location-based application server 28 and, during operation, is used to generate structured requests, which are based on requests that are input to the remote terminal 12 and sent to the location-based application server 28.

[0039] The remote terminal 12 is capable of communicating with the WAP server 38 and the location-based application server 28 using a WAP standard. As known to those skilled in the art, the WAP standard is a protocol that is designed for wireless communication devices to provide secure access to e-mail and text-based web pages. WAP provides a complete environment for wireless applications that includes a wireless counterpart of TCP/IP and a framework for telephony integration. In the preferred embodiment of the location-based services system 10, the remote terminals 12 may also be capable of browsing for location-based services through the use of text and graphical based menus that can be provided to the remote terminals 12 from the location-based application server 28.

[0040] One preferred embodiment of the present invention uses the WAP standard to support the use of a Wireless Markup Language (WML), which is a streamlined version of HTML for small screen displays, to conduct communication and transfer information between the remote terminal 12 and the location-based application server 28. WAP is also capable of using WML Script, which is a compact JavaScript-like language that is capable of running in limited memory on the remote terminal 12. The location-based services system 10 can also be designed to advantageously take advantage of this capability to provide location-based services to users of remote terminals 12 depending on the particular geographic location of the remote terminal 12.

[0041] In this preferred embodiment of the present invention, the WAP standard supports various handheld input methods such as keypad inputs or pointer device inputs that may be generated on various different types of remote terminals 12. As it relates to the present invention, this gives users of the remote terminals 12 the capability of inputting data from keypads for the purposes of entering search requests to the location-based services system 10. In addition, the remote terminals 12 are capable of receiving, interpreting and displaying web pages that include hyperlinks to other web pages that may be selected using various selection methods.

[0042] For the purpose of the present invention, the term wireless application protocol should be broadly construed to include any communication protocol similar to what is commonly referred to as the “WAP standard,” which, as set forth above, is used to transmit text and graphics-based information to remote terminals 12. Although the WAP standard is used in this particular preferred embodiment of the present invention, those skilled in the art should recognize that other text and graphics-based communication protocols could be used in alternative embodiments of the present invention.

[0043] For example, although not specifically illustrated, another preferred embodiment of the present invention could be designed for an i-Mode wireless communication system. i-Mode wireless communication systems use a packet-based communication protocol to communicate between the remote terminals 12 and the base station 16, which essentially means that the remote terminals 12 are connected to the wireless communication system at all times and communicate with the base stations 16 using packets. i-Mode is also capable of providing web-browsing and customized applications to remote terminals 12.

[0044] i-Mode is a proprietary system that uses a subset of HTML, known as cHTML, in contrast to the WAP standard, which uses WML. In this particular embodiment, an i-Mode server is used to connect the base station 16 of the wireless communication system 14 to the location-based application server 28. The remaining details of this particular embodiment are similar to other embodiments of the present invention and, as such, a more detailed discussion is not necessary.

[0045] Referring to FIG. 1, in yet another preferred embodiment of the location-based services system 10, a second remote terminal 40 is connected to a subscriber portal web server 44 through a network connection 42. The network connection 42 may be a private network connection or an Internet connection. As illustrated, the subscriber portal web server 44 is also connected to the location-based application server 28. During operation, the second remote terminal 40 is programmed to receive structured requests that are sent to the location-based application server 28 and, likewise, the location-based application server 28 is programmed to generate structured responses that are sent to the second remote terminal 40.

[0046] The second remote terminal 40 and the location-based application server 28 preferentially communicate with each other using standard web-based protocols that are commonly used in various Internet-based applications. In this embodiment of the present invention, a user accesses the subscriber portal web server 44 through the second remote terminal 40, which is preferentially a computer workstation. As a subscriber to the location-based services system 10, the second remote terminal 40 is assigned a predetermined geographic indicator. The geographic indicator is used by the location-based application server 28 to target services and business content to the remote terminal 40 that are based on the geographic location of the location-based services system 10.

[0047] The user of the second remote terminal 40 may be given the option of setting the geographic indicator to a desired geographic location, which may or may not be the exact geographic location of the second remote terminal 40. For example, if the user is traveling to another city that evening and wants to access location-based services in that particular city, an option can be provided allowing the second remote terminal 40 to designate that particular city.

[0048] In this preferred embodiment of the present invention, the second remote terminal 40 is preferentially a com-
puter workstation that includes multimedia capabilities and includes a microphone and a sound card. As known to those skilled in the art, this allows the second remote terminal 40 to generate sound through a speaker system and receive voice signals through the microphone. Although not specifically illustrated in FIG. 1, this could allow the subscriber portal web server 44 to be connected to the voice recognition server 24 so that voice signals sent from the second remote terminal 40 could be processed similar to the method used to process voice signals received from wireless remote terminal 12.

[0049] Referring to FIG. 1, a business remote terminal 46 is connected to a network connection 48 that is connected to an advertiser portal web server 50. The network connection 48 may be a private network connection or an Internet connection. The advertiser portal web server 50 allows various businesses (i.e., content providers) to add, modify and/or delete campaigns that are designed to promote and sell various products and services through the location-based services system 10. For example, if a particular business entity desires to run a promotion on a particular product or service, the advertiser portal web server 50 allows the business entity to modify their respective listings to include the respective items or services on special.

[0050] As further illustrated in FIG. 1, the preferred location-based services system 10 is also capable of leveraging data that is preferentially grouped in four logical data groupings 52. These logical data groupings include profile data files 54, business data files 56, additional data files 58 and usage data files 60. The data files 54-60 contain detailed information on various items and services that are used by the location-based services system 10, which is set forth in detail below. The datafiles 54-60 can be located on the location-based application server 28, but are preferably maintained on separate servers.

[0051] The profile data files 54 contain a group of logical entities that contain relevant information concerning each consumer of the location-based services system 10. These logical entities include, but are not specifically limited to the following items: consumer name; consumer phone number; consumer identification; consumer password; consumer home address; consumer home phone number; consumer email address; consumer pager number; consumer service subscriptions (detailing the consumers chosen level of participation in one or more services); consumer privacy preferences (detailing information denoting the willingness to share a consumers private data with others based on data type, requestor, service, etc.); consumer service preferences (detailing any specific saved information that is relevant to any of the services which a consumer may use, such as: named locations (such as the address for a consumers work location, or the address(es) of a consumers friend(s); named interests or preferences regarding hobbies, news topic interest, sports, music, preferred brands or chains, banking information and other demographic information. (such as NBA basketball, Jazz music, Italian food, favorite clothing brands or chains, banking information, etc.)); and preferred asynchronous communication method (such as email or pager) listed by service and/or service/content provider.

[0052] The business data files 56 are composed of a group of logical entities containing all relevant information regarding the businesses listed within the location-based services system 10, including but not limited to: business name; business phone number; business text description; business audio description; business video description; business and/or product images; business identification; business password; business category or categories; advertising participation level; advertising campaign information such as parameters that define target market; campaign identification code; advertising content and special deals/discounts; saved data mining/reporting parameters; brands sold; brands serviced; product types sold; product types serviced; product models sold; product models serviced; product model prices; and service prices and inventory list (by brand, product type and product model).

[0053] The additional data files 58 contains a group of logical entities that generally includes any additional content that is capable of being leveraged by the location-based services system 10, possibly including, but not limited to: business ratings (via external evaluation services); weather conditions; driving directions; maps; traffic. Although not specifically illustrated, the residential telephone number and address listings may be provided by local telephone companies through a residential listing server that is connected to the location-based application server 28.

[0054] The usage data files 60 contains a group of logical entities that generally includes all recorded information regarding consumer transactions from remote terminals 12, 40, possibly including, but not limited to: consumer identification (or a unique hash of consumer identification); date; time; service used; request type; search criteria; matched data purchases made, and actions taken. Those skilled in the art would recognize that several other types of usage data might be stored in the usage data files 60.

[0055] As generally set forth above, users of the location-based services system 10 are given the ability to search, via a remote terminal 12, 40, for a business that will satisfy specific purchase or service requirements using multiple access methods (voice, wireless application protocol or web application protocol). The location-based application server 28 is programmed to handle a variety of structured requests and is capable of generating a variety of structured responses in the same format (i.e.—voice, wireless application protocol or web application protocol) that the structured request was received by the location-based application server 28.

[0056] Some of the structured request parameters that are capable of being used for the business services provided by the location-based services system 10 include (but are not necessarily limited to) one or more of the following: product type; service type; business name; business category; product name (or model name); product brand; price level; business or service ratings (i.e. external evaluation from a rating service such as AAA); whether special deals are provided; location (auto-location (locating nearest ATM for instance), pre-defined locations, or consumer-specified locations); hours of operation; availability of service (for example: availability of a open table at a specified time at a restaurant); and company specified within favorites for a category (i.e., name of favorite coffee house franchise). Those skilled in the art would recognize that a variety of structured request parameters might be used in the present invention.

[0057] Optionally, consumers have the ability to “opt-in” to “push” content and advertising services. Push services are defined as services, which proactively deliver content to the consumer through the remote terminal 12, 40, rather than services delivered only following a request by the consumer. As set forth above, the preferences of the consumers that use the remote terminals 12 are stored within the profile data files 54. As such, by way of example only, a consumer that likes
This page contains text that describes a location-based services system. The system includes a campaign management application, a business profile management application, and a mining/reporting and predictive modeling application. The system is capable of delivering enhanced directory assistance services and business services to consumers through remote terminals. The text includes details on how to access these services and the capabilities they offer.
respective remote terminal 12, is then sent from the remote terminal 12 to the base station 16. The base station 16 transmits the voice response to the PSTN 18, which then routes the vocal response, together with the remote terminal identifier, to the PBX 22.

[0009] The PBX 22 transmits the vocal response and the remote terminal identifier as inputs to voice recognition applications and natural language processing applications that are located on servers 24, 26, which in turn, respectively transform the vocal response and the remote terminal identifier into a structured residential listing request that is sent to the location-based application server 28. As set forth in detail above, the voice recognition applications analyze the vocal responses for the purposes of making the determination of the identity of particular words contained in the vocal responses. Any detailed geographic information provided by the user is also added to the structured residential listing request that is sent to the location-based application server 28.

[0070] As illustrated in FIG. 2, the structured residential listing request is used as an input to a residential finder application 62 located on the location-based application server 28. During operation, the residential finder application 62 interprets the structured residential listing request and uses at least one data access routine 64 to locate and retrieve the specific information requested by the structure residential listing request from a respective database file 54-58. Those skilled in the art should recognize that several database servers may be connected to the location-based application server 28 that are used to store various forms of information and content that is provided to users by the location-based services system 10 in varying types of formats, which will be set forth in greater detail below.

[0071] In the preferred embodiment of the present invention, the residential finder application 62 matches up the structured residential listing request with the geographic indicator of the remote terminal 12. If no geographic information is contained in the structured response, the residential finder application 62 conducts a search of the profile data files 54 and the additional data files 58 with data access routines 64 targeted within a predetermined area based on the geographic location of remote terminal 12. If geographic information is included in the vocal response, the residential finder application 62 conducts a search within the geographic area specified by the vocal input. In the preferred embodiment of the present invention the residential listing database files are stored under the additional data files 58 by way of example only and should not be construed as a limitation of the present invention.

[0072] The residential finder application 62 preferentially also searches the profile data files 54 so that if the identity of the person contained in the structured residential request is identified as a subscriber of the location-based services system 10, a remote terminal 12 telephone number and/or an email address may also be added to the response that is provided to the user requesting the desired information. If the located person does turn out to be a subscriber of the location-based services system 10, other embodiments of the present invention allow the subscriber to create a personalized response that is stored in a database file and is provided in response to residential listing requests that identified them.

[0073] In addition to receiving the structured residential listing requests, the residential finder application 62 obtains a geographic indicator and a remote terminal identifier associated with the remote terminal 12. This allows the system to default to the geographic location of the remote terminal 12 to conduct the search, as set forth above. For instance, if the remote terminal 12 is located in Atlanta, Georgia, the residential finder application 62 will know this from the geographic indicator and will only search listings in the Atlanta area.

[0074] Once the appropriate data is located by the residential finder application 62 that is responsive to the structured residential listing request, which in the present example would preferentially include at least one telephone number and/or the address of the person(s) named in the voice signal, the residential finder application 62 is operable to generate a structured residential response that is sent to voice synthesis server 33. As set forth in detail above, the voice synthesis server 33 is programmed to transform the structured residential response into a voice response signal with voice synthesis applications located on the voice synthesis server 33.

[0075] As set forth briefly above, the voice response that is generated by the voice synthesis server 33 can include the name, address, residential telephone number, mobile number and/or email address of the particular person for which the user has requested a residential listing. For those instances where the structured residential responses include more than one residential listing, the residential listing finder application 62 is preferentially programmed to generate a structured residential response that provides the multiple listing results in a predetermined organized listing arrangement.

[0076] The predetermined organized listing arrangement is preferentially set up so that the user of the remote terminal 12 is capable of interacting with the listings provided in the voice response through the use of a keypad input or by voice signals that are spoken into the remote terminal 12 by the user. Preferentially, the information is organized and presented to the user of the remote terminal 12 based on the address of the particular people identified by the residential finder application 62, however, those skilled in the art would recognize that other alternatives of presenting and organizing the results exist (i.e.—ranking the results in geographic order) are capable of being used in varying embodiments of the present invention.

[0077] If the person for whom information has been requested is designated as being unlisted or unavailable, the location-based application server 28 is preferentially programmed to generate a structured residential response that contains a message that indicates that the requested information is unlisted or unavailable. As such, in this particular embodiment of the present invention the location-based application server 28 sends the structured residential response to the voice synthesis server 33, which generates a voice signal that is sent to the remote terminal 12 informing the user that requested the residential listing that the requested residential listing it unlisted or unavailable.

[0078] As briefly set forth above, another preferred embodiment of the location-based services system 10 is capable of providing business services to the remote terminal 12, which are provided to the remote terminal 12 based on the geographic location of the remote terminal 12. If the user of the remote terminal 12 selects the business services option instead of the enhanced directory assistance services option, a variety of information services are capable of being delivered to the user through the location-based services system 10. During operation, the business services are provided to the remote terminal 12 through similar access methods that the residential listing services are provided to the remote
terminal 12. In addition to being able to obtain the address and telephone number of local businesses, various other forms of business information is capable of being transmitted to the remote terminal 12 by the location-based services system 10.

[0079] As generally set forth above and in greater detail below, some of the preferred structured business request parameters that are capable of being processed by the business services of the location-based services system 10 include (but are not necessarily limited to) one or more of the following parameters: product/service types; business names; business category; product name (or model name); product brands; product price level; business or service ratings (e.g.—external evaluation from a rating service such as AAA); whether special deals or offers are being provided; auto-location of predefined services (e.g.—locating the nearest ATM for instance); hours of operation; availability of service (e.g.—availability of a open table at a specified time at a restaurant); and/or business information specified within a user defined favorites category (e.g.—name of favorite coffee house franchise, favorite clothing brands, favorite restaurants).

[0080] In this preferred embodiment of the present invention, once a user of the remote terminal 12 gains access to the business services provided by the location-based services system 10, they are prompted by a voice signal requesting the user to state their respective business request. In response to the prompt for a business request, the user states a vocal response that is received by the remote terminal 12 that contains a predetermined request for a predetermined type of business content. The exact nature and content of the vocal response will vary, depending on the specific type of business/service information that is being requested by the user of the remote terminal 12. As set forth above and below, the preferred embodiment of the present invention includes natural language processing applications that are used to interpret the meaning and context of the words contained in the vocal response, thereby allowing the user of the remote terminal 12 to make a request using requests that are spoken using statements commonly used in everyday conversations.

[0081] By way of example only, let's say that a respective user of the remote terminal 12 wants to obtain business information related to determining the location of a favorite local fast-food restaurant. As such, the user's vocal response that is received by the remote terminal 12 might contain a voice signal that includes a request for business information that could be phrased something along the lines of the following statement: “What is the address of a Burger King restaurant that is close to my present location?” As previously set forth, this preferred embodiment of the present invention is capable of interpreting this request using natural language processing applications to generate a structured response.

[0082] As with the residential services, in this embodiment of the present invention the vocal response that is provided by the user of the remote terminal 12 is transmitted from the remote terminal 12 to the base station 16 of the wireless communication system 14, which in turn is operable to transmit the vocal response to the PSTN 18 that transmits the vocal response to the PBX 22. The vocal response is then sent from the PBX 22 to the voice recognition server 24 where it is processed with voice recognition applications to determine the identity or recognize the respective words that are contained in the vocal response from the user containing a business information request. Although not illustrated, in an alternative embodiment of the present invention the base station 16 is directly connected to the voice recognition server 24, thereby allowing the base station 16 to directly transmit vocal response to the voice recognition server 24.

[0083] After the words contained in the vocal response have been recognized using voice recognition applications, a respective output is generated by the voice recognition applications, which is used as an input to natural language processing applications. As set forth in detail above, the natural language processing applications determine the meaning and context of the words contained in the vocal response that is received by the remote terminal 12. Referring once again to FIG. 2, once the meaning and context of the recognized words contained in the vocal response have been determined, the natural language application is programmed to generate a structured business request that is sent to the location-based application server 28. The location-based application server 28 includes at least one business/services finder application 62 that is operable to process the structured business request by retrieving the requested information.

[0084] As set forth in detail above, the remote terminal 12 also sends a remote terminal identifier with the vocal response that is preferentially integrated in some manner with the structured business request that is ultimately generated and sent to the location-based application server 28. In addition, in this preferred embodiment of the present invention as well as others, a geographic indicator and a remote terminal identifier associated with the respective remote terminal 12 making the structured business request is also obtained or has already been obtained by the location-based application server 28. As illustrated in FIG. 2, the geographic indicator and the structured business request are used by the business/services finder application 62 to generate a structured business response that is responsive to the structured business request.

[0085] In our current example, the preferred business/services finder application 62 uses the geographic indicator of the remote terminal 12 to determine which particular Burger King location is closest to remote terminal 12. A mapping routine within the business/services finder application 62 compares the geographic location of the remote terminal 12 with the respective geographic locations of Burger King restaurants retrieved by the structured business request and makes the determination of which location is closest to the remote terminal 12, which can be based on the distance of the remote terminal 12 from each respective location. As illustrated in FIG. 2, this is accomplished by a data access routine 64 that accesses the appropriate information from the business data files 56, which preferentially contains a database of business listings, addresses, products and/or services provided.

[0086] After the appropriate information is located, the location-based application server 28 is programmed to generate a structured business response that is sent to the voice synthesis server 33. The voice synthesis server 33 converts the structured business response into a voice signal that is then sent to remote terminal 12. In this example, the structured business response would contain the address of the Burger King that is closest to remote terminal 12, which has been determined by the location-based application server 28 based on the geographic location of remote terminal 12.

[0087] In yet another example of this embodiment of the present invention, a user of the business services might request information on a retail store that sells a specific product or provides a specific service. For instance, a user might state, “Who sells or provides product/service (stating the
particular product/service desired)?” After the voice recognition application and the natural language processing application interpret and transform the request into a structured business request, the business/services finder application 62 uses the geographic indicator of remote terminal 12 to narrow the structured business request to retrieve business information contained within a predefined geographic area in which the remote terminal 12 is located. If more than one business sells the item or provides the requested service, the business/services finder application 62 is programmed to generate a structured business response that is sent to voice synthesis server 33 containing a listing of the respective businesses meeting the desired criteria.

[0088] In yet another preferred embodiment of the present invention, the user is able to access the location-based services system 10 by using a wireless application protocol to generate and transmit structured requests to the location-based application server 28. A user of remote terminal 12 uses a keypad or some other equivalent input means to access the location-based services system 10 from a selection menu that is generated on a display of remote terminal 12. In this preferred embodiment of the present invention, once a user chooses to obtain access to the location-based services system 10, the remote terminal 12 is preferentially programmed to display a selection menu that contains a link to the business services and residential listing services provided by the location-based services system 10. Those skilled in the art would recognize that various predefined links and menu selections for various types of services may also be displayed that may or may not be specified by the user of remote terminal 12.

[0089] If the residential listing service is selected on the remote terminal 12, the user is prompted by remote terminal 12 to enter the first and last name of the person for which they desire to obtain information. By default, the remote terminal 12 is preferentially programmed to search for a listing that is contained in the immediate geographic location of the remote terminal 12. For example, if remote terminal 12 is located in the Atlanta metropolitan area, the search will be preset to be conducted using the Atlanta residential listings database. In alternative embodiments of the present invention, an additional input area is provided on the display of the remote terminal 12 whereby the user may designate the particular geographic location to search (i.e.—a city and state input location). As apparent, this allows the user to vary the location searched based on user preferences thereby providing further benefits to the user.

[0090] An additional item the remote terminal 12 is programmed to generate on the display is an icon or a selection area that is designated to cause the remote terminal 12 to transmit the search request, which contain the parameters that have been input by the user, to the base station 16 of the wireless communication system 14. As previously set forth, preferentially the search request is sent to the base station 16 using a wireless application protocol, which for the purpose of the present invention should be broadly construed to include a broad range of standards used by various wireless communication systems 14. The remote terminal 12 also transmits a remote terminal identifier with the search request, which as previously set forth, is assigned to remote terminals 12 for identification purposes. Once received by the base station 16, the search request is directed to the WAP gateway 34, which in turn, is preferentially programmed to transmit all search requests that are received by users accessing the location-based services system 10 to the WAP server 38.

[0091] The WAP server 38 is programmed to interpret the search request and generate a structured residential request that is sent to the location-based application server 28. For identification purposes, the remote terminal identifier is also transmitted to the location-based application server 28 with the structured residential request. As with other embodiments of the present invention, the location-based application server 28 is programmed with a residential finder application 62 that uses one of several data access routines 64 to obtain the requested information from a respective database file 54-58. A structured response is then sent to the WAP server 38, which in turn transmits the structured response to the WAP gateway 34 and ultimately on to the remote terminal 12.

[0092] If the business services option is selected, the remote terminal 12 prompts the user for a search request, which the user enters on the remote terminal 12. The search request is then sent to the location-based application server 28, in a similar fashion as described with the directory assistance services, where it is processed by a business/services finder application 62. The business/services finder application 62 uses data access routines 64 to retrieve the desired information and generates a structured response that is based on the geographic location of the remote terminal 12.

[0093] For example, if the remote terminal 12 is located on the upper north side of Atlanta, Georgia, the location-based application server 28 will be informed of this fact by receiving a geographic indicator from the second remote terminal 12 and will be operable to generate structured responses to structured requests that contain information that is targeted for that particular geographic location. For instance, if a user of the remote terminal 12 enters a search request for information on “Chinese restaurants running specials”, a structured response is generated by the business/services finder application 62 that provides information about Chinese restaurants on the upper north side of Atlanta, and not Chinese restaurants located in irrelevant geographic locations, such as the far south side of Atlanta.

[0094] As previously set forth, in yet another preferred embodiment of the location-based services system 10 a user of the second remote terminal 40 is connected to a subscriber web portal server 44. The second remote terminal 40 and the subscriber web portal server 44 are designed to communicate with each other using standard web-based protocols (e.g., HTML). The subscriber web portal server 44 is connected to the location-based application server 28, thereby providing the second remote terminal 40 with access to the business services and enhanced directory assistance services that are offered in the preferred embodiments of the present invention.

[0095] The second remote terminal 40 is capable of providing voice or keypad input data to the subscriber web portal server 44. As previously set forth, for voice signals the respective vocal responses are sent to the voice recognition servers 24 for processing and, in the case of keypad input data, the subscriber portal web server 44 is capable of generating structured requests in response to user requests received from the second remote terminal 40 in similar manners as set forth above. The preferred location-based services system 10 is capable of allowing its subscribers to take advantage of the services provided by the present invention in a non-wireless environment as well, by supporting the use of standard computing devices that are typically used at home or work.

[0096] As such, by way of example only, lets say a user of the second remote terminal 40 is located in Atlanta, Georgia,
and wants to find local deals on Polo merchandise as well as stores that carry this particular brand that are located near their respective geographic location. In the case of a keypad input search, the user would be prompted for a search request from a web page generated on the second remote terminal 40 where they would enter their desired search parameters, which in the present example might be in the form of the words “POLO MERCHANDISE”.

After the search request is entered and the user is ready to send the request, there is also preferentially an icon or some other type of selection indicator that is generated on a web page being displayed on the second remote terminal 40 that allows the user to submit the request. Once this is selected, the search request, a second remote terminal identifier and a geographic indicator are sent to the subscriber web portal server 44. The subscriber web portal server 44 then transforms the search request into a structured search request that is sent to the location-based application server 28, which processes the structured request similar to other embodiments of the present invention.

In the case of a voice signal input being used, the user would be prompted to state their respective request much like in the example set forth above with relation to wireless remote terminal 12. As such, in the case of our present example, the user might state “POLO MERCHANDISE” after being prompted for a business services request. This vocal response is sent to the voice recognition server 24, which as previously set forth, processes the vocal response similar to other embodiments herein described.

As such, in our present example, a user of the second remote terminal 40 would be provided with a structured response from the location-based application server 28 that contained information relating to businesses that sell Polo merchandise in a geographic location that is relatively close to the second remote terminal 40. In fact, in every embodiment of the present invention, the user may also be given option of selecting a predetermined geographic radius for which they wish responses to be generated during operation. By way of example only, a respective user may only desire to obtain information on businesses located within 15 miles of the remote terminals 12, 40 and as such, may set a setting provided on the remote terminal 12, 40 that only allows responses to business services requests to be generated within a 1-mile radius of the remote terminal 12, 40.

Referring once again to FIG. 1, a wireless carrier server 70 may also be connected to the data files 54-60 through a wireless carrier server 72. The wireless carrier server 72 is preferentially operable to monitor the data that is contained in the data files 54-60. As such, during operation of the location-based services system 10 the wireless carrier server 72 can update a subscriber data file 74 as users of the remote terminals 12, 40 access the location-based services system 10. This allows the wireless carrier 70 to keep track of the usage of the location-based services system 10 and may allow various charges to be applied to the user if applicable.

Referring to FIG. 1, in yet another preferred embodiment of the present invention advertiser subscribers using remote terminal 46 are provided with a usage mining system 100. The usage mining system 100 provides the ability to research usage trends and transactions of the location-based service system 10 via a web application. In FIG. 1, the advertiser preferentially accesses this capability via the advertiser portal 50 using a web browser at business remote terminal 46, which preferentially would serve as a gateway to the application platform. The advertiser portal 50 provides a user of business remote terminal 46 with the ability to access and retrieve data that is stored in the usage data files 60.

Referring to FIG. 3, a preferred embodiment of the present invention includes a usage analysis user interface 102 that preferentially provides a web-based user interface to the usage mining system 100. Using the usage analysis user interface 102, the advertiser is able to select a first analysis option that generates detailed usage analysis from the location-based services system 10. The usage mining system 100 will preferentially generate analysis based on two categories of analysis options. The preferred analysis options include (but are not limited to) an advertising effectiveness analysis application 104 and a predictive modeling application 106. During operation, the user will select fields within each application 104, 106 to create a search query. Based on the inputs, the application 104, 106 will determine the necessary components to access in order to generate the correct analysis. Although not illustrated, a general search query may also be provided that allows the user to search the entire usage database 60 based on searching predetermined parameters.

The preferred steps performed by the advertising effectiveness application 104 are illustrated in FIG. 4. The advertising effectiveness application 104 utilizes the business data files 56 and the usage data database 60 in the location-based services system 10 to generate analysis surrounding the effectiveness of location-based advertising campaigns. The analysis will be capable of addressing questions such as “How many people received my campaign in the downtown area of Atlanta?” The information provided to advertisers provides them with insight to quantify the results of advertising campaigns created with the location-based services system 10.

The user must first determine and enter the input variables that will be used for searching, which is preferentially done via a web-based interface using the business remote terminal 46. Once a search query is entered, it is used to retrieve and view the data stored in the business data files 56 and the usage data database 60. The advertising effectiveness application 104 retrieves data from the business data files 56 and the usage data database 60 to match request parameters that are input by the user. The advertising effectiveness application 104 will then forward the search results to the usage analysis user interface 102, which displays the resulting search response via the web browser on the business remote terminal 46.

Referring to FIG. 4, during operation a user of business remote terminal 46 receives a query entry form from the usage analysis user interface 102. Once a user enters search parameters into the query fields on the query entry form, a search request is sent from business remote terminal 46 to the advertiser portal 50. If the user is using the advertising effectiveness application 104, the search request is sent to a data access component 64. The data access component 64 searches the business data file 56 and the usage data database 60 to retrieve search results that match the criteria set forth in the search request. The search results may then be directed toward a data scoring application 108, which is capable of reformating the search results into various different types of formats.

As illustrated in FIG. 1, in the preferred embodiment of the present invention the content files 52 are located on the location-based application server 28. As such, although not specifically illustrated in FIGS 3-5, the usage
analysis user interface 102 may have to access the location-based application server 28 to retrieve the desired information. In addition, the data access component 64 is preferentially located on the location-based application server 28. As such, the usage mining system 100 preferentially generates search requests that are transmitted to the data access component which in turn, actually performs the searching on the location-based application server 28. However, in other preferred embodiments of the present invention the content files 52 could be mirrored on the advertiser portal 50 and all processes could be performed at that location as well.

[0107] Once the search results are placed in the proper format, the advertising effectiveness application 104 uses the usage analysis user interface 102 to generate a viewable output on business remote terminal 46. Preferentially, the results are provided using a web browser on the business remote terminal 46; however, other ways of providing the results may also be used. The search results may be displayed using numbers, graphs, charts, images or any other method for providing analysis results.

[0108] A list of inputs (at a minimum) that may be used within the advertising effectiveness application 104 include, but are not necessarily limited to: a respective advertising campaign, demographic information, a date or time period, location information, by category, type of listing category, competitive listing categories and a key word inputs. Examples of the type of feedback the user will receive include (but are not necessarily limited to) the following: measure of number of customers reached; frequency of advertisement or listing; competitive analysis comparing advertising listing frequency to category; cost per impression; number of customers reached by top three demographic segments; and 1) demographics (gender, age, ethnicity, marital status, children, income, special interests, hobby, education, homeowner, car owner); 2) target market (city and state); and 3) location (address and location at time of historical interaction).

[0109] The preferred steps performed by the predictive modeling application 106 are illustrated in FIG. 5. The predictive modeling application 106 provides the capability of forecasting or making projections of the type and number of users using remote terminals 12, 40 that will likely respond to offers, listings, campaigns and deals. Examples of the type of feedback the user will receive include (but are not necessarily limited to) the following: identifying customers likely to respond to their campaign by customer segment; identifying customers likely to respond to campaigns or offers for certain products or services, identifying customers likely to request a campaign or listing by customer segment; and identifying demands by peak time or day.

[0110] During operation, the user enters as an input into the predictive modeling application 106 the proposed future advertising campaign/deal as well as the business rules associated with it. Entering and submitting this information builds a search query with the necessary search parameters to explore the profile database 54 and the usage data database 60. The data access component 64 searches the respective databases to find data elements that match the search query. The search results obtained are preferentially sent to the data scoring application 108 to determine the statistical probability of a proposed campaign’s success. These results are then returned to the predictive analysis application 106 to be displayed through the usage analysis user interface 102 on the business remote terminal 46.

[0111] Referring to FIG. 5, if an advertiser uses the predictive modeling application 106, preferentially the usage analysis user interface 102 generates a search parameter entry form that is sent from the advertiser portal 50 to the business remote terminal 46. This allows advertisers to enter search parameters that include potential products or services that are going to be offered along with the business rules that go along with the potential offering. The business rules may include discount information, special deals (e.g., buy two, get one free), special rates or any other type of incentive or restriction. Once the search parameters are entered, the advertiser submits them to the advertiser portal 50, which then forwards the search parameters to the predictive modeling application 106.

[0112] The predictive modeling application 106 then uses a business rules application 110 to extract the appropriate parameters from the search request to formulate a proper search to be submitted to the profile database 54 and the usage data database 60. Once formatted into a proper search format, the business rules application 110 uses data access component 64 to run a search through the profile database 54 and the usage data database 60. The data access component 64 then forwards the search results to the data scoring application 108, which formats the results into one of several possible viewable formats.

[0113] After the data scoring application 108 formats the search results into a usable format, the search results are sent to the predictive modeling application 106. The predictive modeling application 106 then uses the usage analysis user interface 102 to transmit the response to the controller application 100 through the business remote terminal 46. Preferentially, the results are presented to the advertiser via a web browser on the business remote terminal 46.

[0114] The predictive mining input options that are available to advertisers include (but are not necessarily limited to) the following: advertising campaigns; target dates (start date and end date); type of listing category; demographics (gender, age, ethnicity, marital status, children, income, special interests, hobby, education, homeowner, car owner); 2) target market (city and state); and 3) location (address and location at time of historical interaction). Other input options can be provided as needed to allow a more flexible search to be conducted by the advertiser.

[0115] Although not illustrated, in the preferred embodiment of the present invention a wireless communication device may be used to mine data from the location-based services system 10. In this embodiment, the wireless communication device connects to the advertiser portal 50 and uses a wireless application protocol to submit searches in a similar fashion as set forth above. As such, those skilled in the art should recognize that the business remote terminal 46 does not have to be limited to a personal computer and should also be viewed as including wireless communication devices as well.

[0116] While the invention has been described in its currently best-known modes of operation and embodiments, other modes, embodiments and advantages of the present invention will be apparent to those skilled in the art and are contemplated herein.

1-6. (canceled)
7. A computer-implemented method comprising:
   receiving, at a computer system and from a client computing device, a request to forecast performance of a proposed customer-facing feature for a restaurant;
generating, by the computer system, a query based, at least in part, on the proposed customer-facing feature and the restaurant;
accessing, by the computer system, customer transaction data that indicates customer engagement with previous customer-facing features for a restaurant, wherein the customer transaction data was generated, at least in part, from the computer system providing location-based product services for restaurants that were accessed by customers using mobile computing devices;
identifying, by the computer system, data elements from the customer transaction data that match at least a portion of the query generated for the proposed customer-facing feature and the restaurant;
determining, by the computer system, a likelihood of success for the proposed customer-facing feature based, at least in part, on the identified data elements, wherein the likelihood of success indicates a predicted performance of the customer-facing feature for the restaurant based, at least in part, on the customer transaction data;
providing, by the computer system, information that describes the likelihood of success for the proposed customer-facing feature to the client computing device.
8. The computer-implemented method of claim 7, wherein determining the likelihood of success comprises:
identifying, by the computer system, a plurality of customers who have at least a threshold likelihood of purchasing or otherwise engaging with the proposed customer-facing feature based, at least in part, on the identified data elements; and
determining, by the computer system, the likelihood of success based, at least in part, on the plurality of customers.
9. The computer-implemented method of claim 8, wherein the likelihood of success is determined based, at least in part, on a number of customers in the plurality of customers.
10. The computer-implemented method of claim 8, wherein the likelihood of success is determined based, at least in part, on customer types for the plurality of customers.
11. The computer-implemented method of claim 8, wherein the identified data elements comprise data that identifies transactions in which the plurality of customers purchased or otherwise engaged with another customer-facing feature that has at least a threshold level of similarity to the proposed customer-facing feature.
12. The computer-implemented method of claim 11, wherein the identified transactions in which the plurality of customers purchased or otherwise engaged with another customer-facing feature comprise transactions with the restaurant and transactions with other restaurants.
13. The computer-implemented method of claim 7, wherein:
the request includes timing information for the proposed customer-facing feature that identifies timing for the proposed customer-facing feature to be available to customers, and
the data elements are identified additionally based on the timing information.
14. The computer-implemented method of claim 13, wherein the timing information comprises a start date on which the proposed customer-facing feature will be made available to customers.
15. The computer-implemented method of claim 13, wherein the timing information comprises a duration for the proposed customer-facing feature to be made available to customers.
16. The computer-implemented method of claim 17, wherein:
the request includes a demographic restriction that restricts the determination of the likelihood of success of the customer-facing feature to one or more demographic groups of customers, and
the query is generated to include the demographic restriction.
17. The computer-implemented method of claim 16, wherein the one or more demographic groups are based on one or more of the following demographic features:
gender, age, ethnicity, marital status, children, income, special interests, hobbies, education, homeowner status, and car owner status.
18. The computer-implemented method of claim 7, wherein:
the request includes a market restriction that restricts the determination of the likelihood of success of the customer-facing feature to customers within one or more target markets, and
the query is generated to include the market restriction.
19. The computer-implemented method of claim 18, wherein the market restriction comprises a geographic region.
20. The computer-implemented method of claim 7, wherein the proposed customer-facing feature comprises a proposed marketing campaign for a product or service of the restaurant.
21. The computer-implemented method of claim 7, wherein the proposed customer-facing feature comprises a proposed advertisement for a product or service of the restaurant.
22. The computer-implemented method of claim 7, wherein the proposed customer-facing feature comprises a proposed product or service to be offered to customers by the restaurant.
23. The computer-implemented method of claim 7, wherein the proposed customer-facing feature comprises proposed pricing for a product or service to be offered to customers by the restaurant.
24. The computer-implemented method of claim 7, wherein the proposed customer-facing feature comprises a proposed discount for a product or service to be offered to customers by the restaurant.
25. The computer-implemented method of claim 7, wherein the restaurant comprises a restaurant chain.
26. The computer-implemented method of claim 7, wherein the information that describes the likelihood of success includes predicted customer information including a number of predicted customers and demographic information for the predicted customers.