

MOBILE QUERY SYSTEM AND METHOD BASED ON VISUAL CUES**FIELD OF THE INVENTION**

This invention relates to human interaction with observable images using a mobile query system based on visual cues.

BACKGROUND OF THE INVENTION

Advertisers desire consumers to purchase their products/services, or perhaps take some other action, in direct response to advertisements. However, in most cases there is no direct, measurable connection between the advertisement and the consumer's actions. Accordingly, it is difficult for advertisers to measure the effectiveness of their advertising campaigns.

SUMMARY OF THE INVENTION

This invention relates to human interaction with observable images using a mobile query system based on visual cues. The visual cue which piques the user's interest may be from any type of visual content, such as advertisements, logos, signs and editorial, or may be an everyday object such as a flower, a landmark, a pet, or a human face. Visual cues are observable images, which may include text and/or graphics and/or objects. The medium may be varied, such as magazine, newspaper, billboard, poster, catalog, direct mail piece, product packaging, building, clothing, or blimp. The observable image may be rendered through various means, such as print on paper or fabric, back lit on a display, or electronic, as with TV, or the observable image may be an everyday object.

Modern mobile phones include many new capabilities based on the availability of wireless data services. These services enable the transfer of text, audio, image, and video information between the mobile phone and another system. Users of mobile phones are able to use applications which improve the utility of the device, such as, receiving news alerts, sharing pictures with friends, playing games, and retrieving music to listen to. Camera phones introduce a new source of information gathering capability available to the mobile phone user.

1 The inventive mobile query system and method makes use of a networked mobile
2 device with embedded image capture, such as a camera phone, a PDA with an integrated or
3 attached camera, or digital camera with wireless data connectivity. The invention also makes
4 use of wireless network data services. These services are based on a layered set of
5 networking protocols. Picture messaging is a common application which makes use of these
6 networks and is available to users of camera phones. The picture messaging application
7 provides for including a digital image from the camera (typically a recent photo taken by the
8 user) in a message to be sent from the wireless mobile device to a remote device, e.g. to
9 friends and family, to an online personal photo album, or to an online mobile web log. Users
10 specify the recipient by entering the recipient's mobile phone number or email address. Users
11 may also select the destination for the picture message from their personal contacts list on the
12 mobile device, or from a configured list of well known destinations, such as a branded photo
13 management service. The user's mobile phone number is included in all messages sent and
14 this number is available to the recipient for subsequent contact, either through similar
15 messaging, a voice call, or pushing mobile web content. Those skilled in the art will
16 recognize Multimedia Messaging Services (MMS) as an industry standard protocol and
17 service specification for transmitting messages containing text and image data, as well as
18 other types of digital content. MMS based services also include gateway functions to connect
19 to standard internet messaging applications and services, through protocols such as SMTP.
20 Picture messaging is most often implemented on MMS, but some wireless operators have
21 alternate implementations based on other internet protocols such as SMTP or HTTP.

22 The invention also makes use of text messaging services which are available to mobile
23 phone users on wireless data networks. Those skilled in the art will recognize Short Message
24 Service (SMS) as an industry standard protocol and service specification for transmitting
25 messages containing text and binary information such as URLs and download/payment
26 mechanisms. SMS based services also include gateway functions to connect to standard
27 internet messaging applications and services, through protocols such as SMTP.

28 Image indexing systems that include visual search algorithms provide a mechanism to
29 store a plurality of images and search among this set for an image similar to an input image.
30 These systems provide a rank order search result and provide an absolute score for each item
31 returned. This score is an indicator of degree of match. When the absolute score of the item

1 with highest rank is low, these systems provide a threshold mechanism which can be used to
2 determine when the item returned with highest rank, indicative of best match, is, in fact, not a
3 match at all. The threshold mechanism relies on the fact that the numerical distance between
4 the scores of two non-matching images is probabilistically much smaller than the numerical
5 distance between the scores of the matching image and a non-matching image. Visual search
6 systems are tuned based on image application type. For instance, a visual search system
7 would be tuned differently for each of the following applications: trademark/logo search using
8 bi-tonal images; facial recognition using gray-scale images; magazine ad search based on
9 color images. Visual search systems can be augmented by human operators who make final
10 determination of the best match or no match when cases arise where the automated system
11 indicates that the best match is close to the threshold.

12 Personalization and user registration systems, which enable individual users to establish
13 a personal account with configurable preferences and store pertinent user information, are
14 commonplace components of internet web sites such as e-commerce sites, portals, news
15 services, home banking, etc. These systems are accessed by users through a web browser and
16 provide for initial registration and maintenance of a user's personal profile. These systems
17 provide appropriate security and ensure the privacy of user information. If so configured,
18 these systems can also be accessed through the mobile internet using a mobile handset web
19 browser.

20 Marketing automation systems provide the ability to develop, execute, manage, and
21 measure consumer targeted marketing programs which include both digital and traditional
22 forms of consumer marketing. Facilities are provided to create customized responses to
23 consumer requests, based on selected input variables and business rules. These systems
24 manage both human and automated work flow. Typical responses are in the form of email,
25 postal mail, or phone call. A simplified example of a business rule is "to the first 1000 unique
26 mail respondents of the August 1972 issue of Life Magazine ad page 38 for Swanson TV
27 Dinners, send a '2 for 1 coupon' and enter into Disneyland Sweepstakes". Combining mobile
28 messaging capabilities with this type of system enables mobile marketing to be included in
29 the palate of possible fulfillment mechanisms.

30 The practice of creating a personal log of thoughts and activities available on a web site
31 is called web logging, or blogging. A mobile web log is called a moblog. A moblog is

1 created when a user enters text and captures images on a mobile phone and uploads the data to
2 a special purpose blog, most typically by sending an appropriately addressed picture message.
3 Blogs and moblogs may also include links to relevant content on the internet. People who
4 maintain blogs or moblogs derive value from keeping a record of their thoughts and activities.
5 Increasingly this record includes multimedia content and links. The usefulness of a blogging
6 mechanism is increased as it becomes easier to include this additional information.

7 A common practice in the goods and services marketing industry is direct response
8 marketing, which is used to gather information about individual consumers and their specific
9 interest in a product, service, or event, as well as affect their buying behavior. A direct
10 response marketing campaign involves awareness creation or direct solicitation, and one or
11 more response channels. Awareness creation can take many forms. Examples are: direct
12 mail, TV or radio advertisements, e-mail messages, print advertisements in magazines or
13 newspapers, posters, or billboards. There are also many possible response channels.
14 Examples are: mail, telephone, e-mail message, retail store visit, "bingo card", and web site.
15 The campaign may include incentives in an attempt to increase the response rate of the target
16 market. Examples are: contests, quizzes, free samples, and coupons.

17 An objective of direct response marketing is to generate customer leads, i.e.,
18 information about potential customers. At a minimum, this information would include at least
19 one identifier by which the customer could be subsequently contacted. Types of identifiers
20 include home or business telephone number, home or business address, mobile phone number,
21 e-mail address, and internet chat screen name. Using one or more of these identifiers
22 advertisers will follow up with techniques intended to yield a purchase by the consumer. In
23 some cases these techniques are intended to "persist the impression" of the brand, while in
24 others there will be direct solicitation to make a purchase.

25 Contests which require customer participation are popular forms of direct marketing.
26 An example of a program based on visual cues would be one where an image of a particular
27 subject, such as a product package, store sign, or logo was required to be included in a picture
28 to participate in the contest or brand promotion. An automated system, such as disclosed
29 herein, receives entries submitted by camera phones and processes image content, returning a
30 response to the user that the entry was accepted or rejected. Rejects would occur when the

1 subject was not found in the image and the user would be informed in the response as to how
2 to participate in the promotion.

3 Customer lead data is also used to improve the advertiser's understanding of the target
4 market. In this case, additional information which is gathered from consumers is viewed and
5 analyzed in aggregate to discover patterns or trends. This additional information includes
6 "hard data", personal information such as age, sex, and location, as well as "soft data", such
7 as favorite sport or hours per week watching TV.

8 The effectiveness of direct response marketing campaigns is measured by response rate.
9 Response rates are studied for the various mechanisms and are shown to vary considerably,
10 but are most often well below 1% (less than 1% of targeted customers respond). In some
11 cases it is possible to accurately measure response rate, for instance, a customer responds
12 directly to a specific e-mail solicitation. In other cases, it is impossible to determine what
13 prompted a user to respond, for instance, a user visits a corporate web address found on a
14 print advertisement or buys a certain pair of shoes two weeks later in a retail store. The value
15 of the medium and response channel is increased when it can be directly measured.

16 Advertisers use words, text, visual ad formats and brand logos to create lasting
17 impressions in consumers' minds. Costs to advertisers are directly related to volume. For
18 example, magazine circulation or venue traffic will directly relate to the cost for the advertiser
19 to place the ad or banner. This cost is typically quoted by the media outlet as CPM, or cost
20 per thousand impressions. The volume estimates used to justify CPM rates do not guarantee
21 that number of impressions, rather, for a given type of media outlet, the volume data serves as
22 a comparative statistic. The value of an advertising medium is increased when it can be
23 proven with specific statistics that ad impressions are persisted longer. The value of an
24 advertising medium is also increased when gross estimates of impressions are supplemented
25 with specific, verifiable statistics of actual impressions. The value of an advertising medium
26 is increased again when a static ad such as a magazine page or shopping mall poster can be
27 practically connected to other media via an electronic mechanism such as the inventive
28 mobile query system.

29 Print media advertisements and out-of-home advertisements often include a call-to-
30 action. There is a spectrum of methods used to convey the call-to-action. In some instances it
31 is overt and unmistakable, such as "call this number today to order", and in other instances the

1 message is more subtle. In most advertising in these formats there is a mechanism for the
2 consumer to follow up on interest in the ad. Typically this is in the form of a phone number
3 or web site address. A person who desires to respond to the call-to-action or seek more
4 information about the product, service, or event, must call the number or seek other sources
5 such as a web site. It is often the case that a person will not respond, even though there may
6 be interest, either because the response mechanism is not convenient, the response mechanism
7 does not provide what the person is interested in, or, as time passes, the person forgets about
8 the desire to respond. The mobile query system of the invention allows the user to engage
9 when interest is piqued and provides a response that is based on user selectable preferences,
10 provides value to the user.

11 The use of cross-media marketing in the advertising and brand management industries is
12 on the rise. Tie-ins between radio, TV, print, direct mail, and internet media outlets are
13 commonplace in many advertising campaigns. The mobile phone is a recent addition to the
14 list of possible outlets, as evidenced by the use of text messaging to involve consumers in
15 quests for prizes and access to information. Mobile marketing in its simplest form, is the
16 advent of advertising on the mobile phone by sending the consumer text or multimedia
17 messages. Likewise, mobile commerce solutions allow consumers to make purchases from
18 their mobile phone using the mobile web.

19 Wireless data services offered by wireless network operators are based on protocols
20 such as GSM/GPRS, CDMA/1xRTT, WiFi (802.11a/b/g), EDGE, CDMA2000, WCDMA.
21 Wireless data networks may also provide location-based services wherein it is possible to
22 determine the location of the mobile subscriber or determine the billing zip code of the
23 subscriber.

24 The invention features a system and method which enables a user to use a camera phone
25 to indicate their interest in a product, service, event, or editorial content based on a visual cue,
26 or to engage in a specific marketing promotion or other activity which includes a visual cue.
27 A response based on that expressed interest or engagement is provided to the user. The visual
28 cue need not be altered for this purpose. In a typical use, the user takes a picture of the item
29 of interest and sends the image data via a wireless data service to the mobile query service,
30 having the effect of requesting a response for that visual cue or indicating the user's desire to
31 participate in the promotion. When a query is received by the mobile query service the image

1 data in the message is used to perform a lookup for a match in an image indexing system.
2 The image indexing system is maintained with a plurality of images (precisely, data extracted
3 from said images) and associated with each image is a response function. Examples of
4 commercial image indexing and visual search systems include Scene and Logo Classifier
5 from Imagen Inc., Espion SDK from Idee Inc., PixServe and PixSearch from PixLogic, and
6 ViPR from Evolution Robotics. Responses may be automatically generated and directly
7 delivered to the user, or trigger third-party actions on behalf of the user. A typical response to
8 the user is a mobile text message thanking the user for their interest in the product and
9 providing additional information about the product or where to find additional information.
10 Examples of other types of possible responses are sending an e-mail or postal mail to the user
11 containing product information, sending the user mobile multimedia advertising in the form of
12 an image or audio/video clip, entering the user in the advertised contest or sweepstakes,
13 sending the user an electronic or paper coupon, sending the user directions to the closest retail
14 outlet or specific event venue, enabling the user to directly purchase a product or service via a
15 re-direction to the specific purchase page on a mobile commerce website, providing the user
16 with information on the best purchase price currently available on the internet, providing the
17 user with a free sample, having the user vote or take a quiz, adding appointments or reminders
18 to the user's mobile phone calendar or other electronic calendar, having a customer service
19 representative call the user, or creating a blog entry in the user's blog or moblog which links
20 corresponding online content.

21 Queries from consumers through this mechanism is, in advertising industry terms, a
22 direct response channel. The usefulness and value to the advertiser or media outlet of a direct
23 response mechanism is increased as additional information about the consumer is available.
24 The invention provides for all user queries to be logged in a database. Additional information
25 is also logged, if available. Examples are originating mobile phone number, date/time of
26 request, date/time of image capture, mobile location when the request was made, user profile
27 (e.g., age, sex, home address, work/school address, contact info), and type of responses
28 provided. If a response involves subsequent interaction by the user, for example, purchasing a
29 product, then the results of this interaction are also logged, if available. Reports are then
30 generated from the database to provide varying degrees of detail about consumer interest and
31 patterns. These reports are created for the benefit of specific media outlets and advertisers.

1 For example, a report to a magazine publisher provides information about reader interest and
2 interaction in products advertised or articles read. This information would include
3 demographic data derived from the database. Lead generation reports include information
4 about specific readers who made a query on a particular ad.

5 The value of the logging and reporting mechanism is enhanced when it is possible to
6 identify the media outlet which is the source of the user request. For example, an advertiser
7 will often run identical ad copy in several magazines and newspapers contemporaneously,
8 however a publisher, as well as the advertiser, will be interested to know that the subscriber
9 made the query based on the ad in a particular publication. The invention provides for a mode
10 of operation where identifying an issue of a magazine is performed using the magazine cover
11 as the identifier of that particular issue. This mode is similar to the general purpose visual cue
12 matching system described above, however until the user has indicated the magazine issue in
13 use, normal queries will return an error response message. Prior to making normal queries of
14 specific pages from the magazine, the user would first make a request based on the cover of
15 that magazine. Similar to normal use, the user would take a picture of the cover and send it to
16 the service. The system would respond with a text message to the user indicating that that
17 magazine was recognized and supported, and to proceed with normal queries. This action
18 would create a temporary user state in the system and subsequent queries from that user
19 would include the magazine name, and date of issue, in the resulting log entry. This
20 operational mode is supported by maintaining magazine cover image data entries in the
21 database. Normal user queries will search these entries first, to determine if the user state
22 should be switched to a different magazine. In this way, when a user switches between
23 magazines no special action is required apart from requesting a new magazine as described
24 above.

25 The invention provides for alternate means of identifying the media outlet. In one
26 alternate, the service provides a unique destination address for queries originating from a
27 specific media outlet, such as a magazine or newspaper. This address may be in the form of
28 email address or phone number (including short-codes), or alias for either.

29 In a second alternate, the system derives the most likely media outlet by tracking and
30 analyzing current and historic usage patterns of a given user where clusters of queries are
31 analyzed for matches which are singularly or compositely unique to a specific media outlet.

1 For instance, if a match yields only one source magazine, then it can be inferred that queries
2 closely clustered in time are from this same magazine if and only if each of the queries in the
3 cluster are also known to be sourced in that magazine issue. In the case where there are
4 multiple possible sources for all matches in a cluster, then the cluster is analyzed for a source
5 unique to the entire set. Other parameters used to support the inference process include
6 historical usage patterns of the user, circulation data for probable sources, issue date for
7 probable sources, and location of current queries.

8 In a third alternate, the user chooses the media outlet from a list in an interactive menu
9 on the user's mobile phone.

10 If the media outlet is out-of-home, the date/time and location of a query are used to
11 pinpoint the venue and event where the query originated, which is used to uniquely identify a
12 specific media outlet.

13 The invention also provides for the maintenance of the image indexing system. Image
14 data used to support the matching function is added to, and deleted from the system on a
15 regular basis. Associated with each image record is a media outlet source and, if applicable,
16 an advertiser source. The process of inserting new ad copy ensures that identical ads are not
17 duplicated in the system by first searching the existing database for the new ad. In the case
18 where an identical ad runs in multiple magazines there will be multiple media outlet sources
19 associated with the image data record. When identical out-of-home banner or poster style ads
20 are on display in multiple locations, there may be multiple locations associated with the image
21 data record.

22 The invention also includes the capability of customizing the response function to each
23 query type (magazine ad, editorial, outdoor poster, product package, etc.), and to have
24 multiple possible responses defined per query, where the actual response is determined by
25 user preference. The maintenance facility of the image index system supports this
26 customization by providing for the definition of multiple possible response types to be
27 associated with each image data record. Examples of possible response types are delivery
28 method (email, mobile text message, mobile multimedia message, mobile web connection,
29 voice call, postal, or combination), include directions to nearest retail outlet, search for
30 coupons and rebates, automatically register for sweepstakes, search for and send free samples,
31 create blog entries linking online magazine editorial content, connect real-time to preferred

mobile internet retailer, or send mobile content such as audio clips or graphics. Response types are often combined to define the complete response function. The method provides for personalizing the system for each user by allowing the user to select preferences for how the service responds to different types of queries. For example, send a calendar reminder message as an email for ads which are event based. These preferences are set by logging on to the user's service account web page, via either the internet and a web browser on a personal computer, or the mobile internet and a mobile web browser on a mobile handset. In some cases these static preferences may be augmented by a real-time interactive selection by the user via the mobile internet. Interactive examples, prompted by a specific initial response, include participating in quizzes or voting, playing an online game, providing specific contest entry information, or overriding static preferences. Examples of protocols which support mobile interactive prompting are two-way SMS, WAP Push, WAP Bookmarks, and SMS links to WML or XHTML.

Users of the service are made aware of its availability for any given media outlet through various mechanisms. Examples include, specific editorial content describing the service, specific ads over various media describing the service, specific and unique to this service branded logo identifier on supported ads, specific ad or editorial content included with the online version of the magazine, messages sent directly to the user's mobile phone, or partner marketing programs with wireless carriers and/or mobile handset manufacturers.

Users of the service can also use a digital camera to capture an image, transfer the image to a personal computer, and send the image data to the service via the internet. This has a similar effect as sending a query using a mobile phone.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects, features and advantages will occur to those skilled in the art from the following description of the preferred embodiments and the accompanying drawings in which:

Fig. 1 is a schematic diagram of the preferred embodiment of the inventive mobile query system;

Fig. 2 is a block diagram of the preferred embodiment of the mobile query service for the invention;

1 Fig. 3 is an example of a query record for the invention;
2 Fig. 4 is a flow chart of a response handler for the invention; and
3 Fig. 5 is a diagram of service address based partitioning for the invention.

4 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5 In Fig. 1, mobile user 120 sees a visual cue (text and/or graphics) 110 and uses camera
6 phone 121 to take a picture of the visual cue. Mobile user 120 sends the picture to the mobile
7 query service 100 using the mobile network 130. Mobile query service 100 processes the
8 query. If the mobile user 120 is not known to the mobile query service 100 then a response
9 text message is sent via the mobile internet 130 to camera phone 121 informing the mobile
10 user 120 how to register to use mobile query service 100. In some cases, the initial picture
11 message is sufficient to register mobile user 120 since only the user's mobile number is
12 required. If the visual cue 110 is not known to the mobile query service 100 then a response
13 text message is sent via the mobile internet 130 to camera phone 121 informing the mobile
14 user 120 how to use the mobile query service 100 and where to find additional information on
15 currently supported visual cues. If both the visual cue 110 and the mobile user 120 are known
16 to the mobile query service 100 then a response text message is sent via the mobile internet
17 130 to camera phone 121 informing mobile user 120 that the query was successful and
18 indicating the actions which have been triggered by this query. In some cases, this response
19 text message is the entirety of the response and includes complete information to fulfill the
20 query. An alternate response message delivery option is available if mobile user 120 enables
21 this option with mobile query service 100. In this case the response is sent as an email
22 response, instead of, or in addition to, a text message response. This optional email response
23 is sent by mobile query service 100 through the internet 131 to mobile user 120 who accesses
24 internet email services through computer terminal 122. This email response may be identical
25 in content to the corresponding text message response, or it may contain additional or
26 different content.

27 Mobile query service 100 can take input from a variety of sources such as media outlets
28 141, advertisers 142, and retailers 143, or agents acting on their behalf, and collectively
29 referred to as affiliates 140. This input can include visual cues in the form of digital image
30 representations or physical reproductions, and/or text. This input may also includes

1 corresponding information needed for the fulfillment of a successful query in the form of
2 actions to take and appropriate responses to generate, for each visual cue. Actions and
3 responses may be carried out by either the mobile query service 100 or the affiliates 140.

4 It is common for affiliates 140 to contact individual prospective customers through post
5 and package delivery services 133, the public switched telephone network 132, the internet
6 131, and the mobile network 130. In this invention the mobile user 120 is an individual
7 customer/prospective customer and the contact by affiliates 140 is triggered by mobile query
8 service 100 to fulfill a successful query by mobile user 120. The fulfillment on behalf of, and
9 directed to, the mobile user 120 is varied and can include, but is not limited to, direct
10 marketing, commerce, and informational content. The mode of the response is variable and
11 can include, but is not limited to, contact by voice, by internet chat, through additional email
12 and text messages, through digital multimedia, by website referral, and through postal mail or
13 package.

14 Actions taken may be either automatic or interactive. An automatic action, which is
15 performed on behalf of, and unassisted by mobile user 120, is variable and can include, but is
16 not limited to, sweepstakes entry, signup for free sample, signup for calendar reminder
17 messages, signup for magazine subscription, add product to gift registry, add product to
18 personal shopping list, signup for club membership, creation of personal blog entries linking
19 corresponding web content, and interest reminder in the form of advertisement information in
20 an email. An interactive action which requires either real-time or deferred engagement of
21 mobile user 120 through mobile network 130 and camera phone 121 or internet 131 and
22 computer terminal 122, can include, but is not limited to, mobile commerce, e-commerce,
23 online contest entry, online voting, online gambling, and downloading mobile content such as
24 ring-tones and games. All automatic actions may alternatively be acted on via interactive
25 prompt if it is the user's desire to explicitly control certain actions on a query by query basis.
26 The actual behavior of the mobile query system experienced by mobile user 120 is determined
27 by the custom action-response record corresponding to each visual cue supported by the
28 mobile query service 100. Mobile user 120 can directly affect this behavior by establishing
29 personal preferences through user preference interface 232 of mobile query service 100.

30 In Fig. 2, the inbound message handler 210 and the user lookup 220 and the preference
31 lookup 230 and the image lookup 240 collectively produce the query record 300 shown in

1 fig. 3, which is passed to response handler 250. The inbound message handler 210 receives
2 query messages from mobile network 130. At a minimum, the query message contains the
3 following information: the user's mobile phone number, a digital image of the visual cue, and
4 an indicator of mobile network vendor which transported the message. This information is
5 extracted from the message and passed to user lookup 220 as query message data 310,
6 included in newly created query record 300. In user lookup 220, the mobile phone number is
7 used to lookup the user in mobile user registration data 221. If the user is found then
8 registration data for that user is added to query record 300 as user contact information 330.
9 The user account number 320 is also added to query record 300. If the user is not found, then
10 the user account number 320 is null. User lookup 220 then passes partially completed query
11 record 300 to preference lookup 230. Preference lookup 230 uses the user account number
12 320 to lookup this user's personal preferences in mobile user preference data 231. These
13 preferences are added to query record 300 as user preferences 340. If the user account
14 number 320 is null, no lookup is performed and user preferences 340 is set to null. Preference
15 lookup 230 then passes partially completed query record 300 to image lookup 240. Image
16 lookup 240 uses the digital image of the visual cue contained in query message data 310 to
17 request an indication of best match or no match from image data indexing 241. Visual cue ID
18 350 for the best match is added to query record 300. If there is no match, then visual cue ID
19 350 is set to null in query record 300. Image lookup 240 then passes completed query record
20 to response handler 250.

21 Figure 4 shows the control flow of response handler 250 which accesses query record
22 300 to perform its task. The task is to determine and send the appropriate responses and
23 generate the appropriate actions, if any, based on the mobile user's 120 query, the user's
24 preferences, and the action-response program data 251. Actions are fulfilled by affiliates 140.
25 To trigger fulfillment of these actions, response handler 250 determines the type of action and
26 reformats user contact information 330 to a prearranged format. This data is then delivered
27 periodically or in real-time by electronic means such as bulk FTP file transfer, e-mail, or web
28 service interface, or it may be printed and delivered via post or package courier. The method,
29 address, and format of communication to affiliates 140 is included in action-response program
30 data 251.

1 When response handler 250 determines that a text message response should be sent to
2 mobile user 120, the text message is addressed to the mobile number in query message data
3 310. To handle multiple, independent mobile networks, the mobile network operator in query
4 message data 310 is retrieved to determine which mobile network gateway service to route the
5 text message to. When response handler 250 determines that an email response should be
6 sent to mobile user 120, the email is addressed to the email address in user contact
7 information 330.

8 A possible response is to provide the address of the physical location nearest to mobile
9 user 120 of a specific retailer. If the current location of mobile user 120 is available from
10 mobile network 130 then that is used to compute the nearest retailer. If not, then if the
11 registration zip code of mobile user 120 was provided through user registration interface 222
12 it is available for use by response handler 250 in user contact information 330 and is used to
13 compute the nearest retailer. If not, then if the billing zip code of mobile user 120 is available
14 from mobile network 130, then that is used to compute the nearest retailer. If not, then the
15 response generated indicates that location-based responses are not possible until registration
16 zip code is provided through user registration interface 222. Retail locations are stored in
17 action-response program data 251 or are dynamically retrieved by response handler 250 using
18 internet based web services.

19 A possible response is to enable mobile user 120 to make a purchase of the product in
20 visual cue 110 using mobile commerce capabilities of mobile phone 121. In this case the
21 response provides a direct link to the product purchase mobile web page for mobile user's 120
22 preferred mobile commerce retailer. This direct link allows the mobile user 120 to bypass the
23 steps of traversing the mobile web pages to find the product of interest. Response handler 250
24 determines from action-response program data 251 if mobile commerce redirection is enabled
25 for this query. If so, and user preferences 330 provides a preferred mobile internet retailer,
26 then the response generated includes a link to the product purchase mobile web page of this
27 mobile internet retailer, which is retrieved from action-response program data 251. Mobile
28 user 120 then has the option to purchase the product indicated in visual cue 110.

29 Action-response program maintenance facility 252 provides operation and maintenance
30 functions for creating, updating, and deleting action-response program data records. Records
31 in action-response program data 251 and image data 242 share a common field. This is the

1 visual cue ID 350. An action-response program data record has one or more corresponding
2 records in image data 242, i.e., multiple images can point to a single response program. An
3 action-response program data record is retrieved using visual cue ID 350.

4 Image data maintenance facility 243 provides operation and maintenance functions for
5 creating, updating and deleting image data records. Input from affiliates 140 is provided in
6 either digital or physical form, the latter scanned and converted to digital by image data
7 maintenance facility 140. Alternative input formats for representing image data, such as
8 TIFF, PDF, EPS, DCS2, JPEG, are accepted and normalized for use with image data indexing
9 241 prior to storage in image data 242. Image data records are created with a unique ID
10 known as visual cue ID 350 which provides the link to corresponding records in response
11 program data 251. When at least one corresponding action-response program record is linked
12 to a new image data record, the new record is flagged as available for use and will be
13 available to image data indexing 241 for matching.

14 Affiliates 140 may choose to use the mobile query system for a specific promotional
15 program or with a specific media outlet, such as a specifically named magazine. Figure 5
16 shows how query destination address 430 is used to partition the image data 242 and the
17 action-response program data 251. This provides the capability to manage and track multiple,
18 affiliate based programs by creating unique addressing. Mobile user 120 is informed that to
19 participate in a certain promotion, or with a certain media outlet, a specific query destination
20 address 430 should be used for all communication. Queries received by inbound message
21 handler 210 are processed to extract the query destination address from the received message
22 and add this to query message data 310. Response handler 250 uses the query destination
23 address to select the appropriate image data partition 410 and action-response program data
24 partition 420, which are matched one to one. A separate partition is maintained for the
25 generic address of the mobile query service. Both email address format and mobile network
26 number format addressing schemes are supported. The mobile network numbering plan
27 includes "short code" addressing, which is also supported.

28 User registration interface 222 and user preference interface 232 are accessed by mobile
29 user 120 to input contact information, personal information, and operational preference
30 information. A common implementation is as an internet web site and accessed via computer
31 terminal 122. It may also be implemented as a mobile internet web site and accessed through

1 mobile phone 121. Mobile user 120 may occasionally revisit these interfaces to provide
2 additional information and update preferences. In this way mobile user 120 can increase or
3 decrease the level of participation with the mobile query service.

4 Event logs 261 are created and maintained for tracking usage of the system. Data is
5 logged from all main processing components. The event logging 261 and report generation
6 system 260 provide support for the business goals of the mobile query service by delivering
7 appropriate data to affiliates 140, such as customer leads, advertisement performance, media
8 outlet performance, demographic data, and subscriber patterns. Report generation 260
9 includes a privacy policy monitor function to limit disclosure of personal data to prescribed
10 levels.

11 Although specific features of the invention are shown in some drawings and not
12 others, this is for convenience only as each feature may be combined with any or all of the
13 other features in accordance with the invention.

14 Other embodiments will occur to those skilled in the art and are within the following
15 claims.
16

What is claimed is:

- 1 1. A method of accomplishing a mobile query and response system based on visual cues,
2 in which a user captures and transmits an image with a networked mobile device with image
3 capture and transmission capabilities, comprising:
4 providing searchable records comprising stored image data and response information
5 associated with such data;
6 receiving the captured image from the mobile device;
7 using the received image to perform an at least partially automated search of the
8 records, to find in the records one or more images that match the transmitted image;
9 if a match is found, retrieving the response information associated with the stored
10 image data for the matching image; and
11 using the response information to send a reply to the user.
- 1 2. The method of claim 1, wherein the reply is sent to the mobile device.
- 1 3. The method of claim 1, wherein the device is a mobile telephone or personal digital
2 assistant (PDA).
- 1 4. The method of claim 1, further comprising determining if the user who sent the
2 received image has previously registered as a user.
- 1 5. The method of claim 4, wherein determining if the user who sent the received image
2 has previously registered as a user is based on an identification of the networked mobile
3 device from which the image is received.
- 1 6. The method of claim 4, wherein the reply to the user depends at least in part on
2 whether the user has previously registered.
- 1 7. The method of claim 4, further comprising determining preexisting preferences for
2 such authorized user.
- 1 8. The method of claim 6, wherein the response information comprises a set of
2 predetermined query responses.
- 1 9. The method of claim 1, wherein the response information comprises product source
2 information.
- 1 10. The method of claim 9, wherein the product source information comprises an internet
2 address or a street address.

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- 1 11. The method of claim 1, wherein the response information comprises providing a direct
2 link to a web page.
- 1 12. The method of claim 1, wherein the response information comprises product
2 information.
- 1 13. The method of claim 1, wherein the response information comprises content provider
2 information
- 1 14. The method of claim 1, wherein the response information comprises content provider
2 information.
- 1 15. The method of claim 1, wherein the response information comprises image
2 information.
- 1 16. The method of claim 15, wherein the image information comprises video images.
- 1 17. The method of claim 15, wherein the image information comprises still images.
- 1 18. The method of claim 1, wherein the response information comprises audio
2 information.
- 1 19. The method of claim 1, wherein the reply comprises an email or postal mail message.
- 1 20. The method of claim 1, wherein the reply comprises a telephone contact.
- 1 21. The method of claim 1, wherein the reply comprises multiple contacts with the user.
- 1 22. The method of claim 1, wherein the reply comprises confirmation of an action taken in
2 response to the match.
- 1 23. The method of claim 21, wherein the action taken comprises a contest entry.
- 1 24. The method of claim 1, wherein the reply comprises altering game play.
- 1 25. The method of claim 1, further comprising logging information regarding the queries
2 in a database.
- 1 26. The method of claim 25, wherein the logged information comprises one or more of the
2 originating mobile phone number, the date and time of the query, the date and time of the
3 image capture, the location from which the query was sent, the user profile, and the types of
4 replies made.
- 1 27. The method of claim 25, further comprising generating a report from the database.
- 1 28. The method of claim 27, wherein the report comprises demographic data.
- 1 29. The method of claim 27, wherein the report comprises information regarding a
2 particular image.

1 30. The method of claim 1, further comprising identifying the media outlet that was the
2 source of the captured image.

1 31. The method of claim 30, wherein identifying the media outlet that was the source of
2 the captured image comprises using a publication cover as an identifying image.

1 32. The method of claim 31, wherein the user first makes a query based on the publication
2 cover, and only then may make a query based on an image in the publication.

1 33. The method of claim 32, wherein the identification of the publication and the query
2 based on an image in the publication are both stored in a query database.

1 34. The method of claim 30, wherein identifying the media outlet that was the source of
2 the captured image comprises tracking and analyzing at least recent past queries from the
3 user.

1 35. The method of claim 34, wherein identifying the media outlet that was the source of
2 the captured image further comprises determining if recent past inquiries closely clustered in
3 time are from a single media source.

1 36. The method of claim 34, wherein identifying the media outlet that was the source of
2 the captured image further comprises determining the location of recent queries.

1 37. The method of claim 30, wherein identifying the media outlet that was the source of
2 the captured image comprises the user selecting a source from a series of choices
3 communicated to the mobile device.

1 38. The method of claim 30, wherein identifying the media outlet that was the source of
2 the captured image comprises determining the date, time and location of the query.

1 39. The method of claim 1, wherein the records further comprise at least one media
2 source.

1 40. The method of claim 39, wherein the records further comprise an identification of the
2 advertiser.

1 41. The method of claim 1, further comprising allowing the user to select reply
2 preferences.

1 42. The method of claim 1, wherein the captured image comprises a unique service
2 identifier.

1 43. The method of claim 42, wherein the unique service identifier comprises visual
2 information located in close proximity to an advertisement.

1 44. The method of claim 1, wherein the device comprises a digital camera and a device for
2 transmitting the camera image over the internet.

1 45. The method of claim 1, further comprising maintaining the searchable records
2 database.

1 46. The method of claim 45, wherein affiliates are provided limited access to the
2 searchable records database to maintain records associated therewith.

1 47. A mobile query and response system based on visual cues, in which a user captures an
2 image with a networked mobile device with image capture and transmission capabilities, and
3 transmits the image to the system, the system comprising:

4 one or more searchable databases comprising stored image data and response
5 information associated with such data, in which such databases include matching image
6 identification information;

7 image lookup means for using the received image to perform a search of the records,
8 to find in the records an image that matches the transmitted image;

9 response handler means, responsive to the image lookup means, for retrieving the
10 response information associated with the stored image data for a matching image, and using
11 the response information to send a reply to the user.