Title: A METHOD AND SYSTEM OF CONNECTING PRINTED MEDIA TO ELECTRONIC INFORMATION AS A RESPONSE TO A REQUEST, USING AN OPTICAL GLYPH AND AN ELECTRONIC FINDER

Abstract: Methods and systems for providing requested information over a computer network are presented. The invention uses machine-readable codes and electronic finders to generate requests for information, which are directed to a first service to interpret the request and then to a second service for filling the request. Information is supplied to a customer through message services such as e-mail, instant-messaging or other mail systems that work over computer networks, preferably the Internet. Optical glyphs and portable electronic finders provide flexibility to the system by allowing for incorporating the glyphs on common printed media and allowing for the easy acquisition and automatic transmittal of the request to the second service. The invention provides for flexibility and expansion by using a glyph capable of being used to store a very large number of different codes and by providing a method of payment for services. Several embodiments of the invention are presented including a reader-response embodiment, a business card embodiment, and a personalized catalog embodiment.
A METHOD AND SYSTEM OF CONNECTING PRINTED MEDIA TO ELECTRONIC INFORMATION AS A RESPONSE TO A REQUEST, USING AN OPTICAL GLYPH AND AN ELECTRONIC FINDER

FIELD OF THE INVENTION

The present invention is related to methods and systems of soliciting and delivering requested information over a computer network. More specifically, the present invention is related to providing a method and system for directing requests for information to providers of information.

BACKGROUND OF THE INVENTION

Computers and computer-driven electronic devices have proven to be efficient tools for disseminating information and conducting business. The popularity is evident from the usage of the World Wide Web (WWW) which, from its inception in 1991, has grown to over 17 million host computers that post over 1 billion WWW pages by mid-2000 (Hobbes’ Internet Timeline v5.1 http://www.isoc.org/zakon/Internet/History/HIT.htm). The vast amount of information has reshaped many notions of how information should be stored, searched and accessed. In fact, the use of networked computers and other electronic devices allows the average person to access growing amounts of information in ways that are new to human experience. As a result, constant improvements in methods are required to efficiently identify and access information over networks.

The problem of delivering needed information to a customer over a computer system or network has received much attention. Specifically, the popularity of the WWW has focused much effort on improving information delivery using the Hypertext Transfer Protocol (HTTP) over the Internet. The other Internet communications protocols, such as Simple Mail Transfer Protocol (SMTP) for e-mail delivery or File Transfer Protocol (FTP) for exchanging files between host computers have not received as much attention as the WWW. Some of the many methods for
bringing customers in contact with information, and in particularly information that customers would find useful, can be categorized as follows:

Customer-driven WWW Surfing: A computer savvy customer seeks out desired information without knowing exactly where to look, relying on many of the tools available to her. Customer’s actions include but are not limited to: using a search engine; following links, including banner ads, from one found WWW site to another; guessing the Uniform Resource Locator (URL) of a web site; or using other computer or networked-based sources of information. Examples of the many tools available to the customer include browsing the WWW using a web browser, such as Netscape Navigator or Internet Explorer, and searching the WWW using a web browser through search engines provided by Yahoo!® or Google™.

Customers thus use their knowledge of the WWW to find, or at least begin to find, the information that they want. These methods are not particularly advantageous for either customers or information providers. An information provider does not have a high likelihood of reaching a large audience as the method relies on the motivation and knowledge of the customer, who must engage in a sometimes frustrating and long search that may not yield the required information.

Direction of Customer to Information through Announcements: A customers is made aware of the existence of a WWW site or e-mail address by non-computer-based sources of information, such as an advertisement or announcement in a newspaper or magazine, on television or the radio. Customers are presenting with a URL or e-mail address that can be used when a customer has access to a computer or other device that can be connected to the WWW.

This method is relatively easy for providers to implement, particularly if there are existing channels through which they communicate to potential customers. However, this method relies on the action of customers to write or remember an address, or to carry media containing the address, such as a newspaper advertisement, to their computer or other electronic device for requesting information.

Direction of Customer to Information via Internet-based Methods: A customer is presented with the option of obtaining more information while interacting over a computer network. Information is delivered by one of several means, such as on a WWW site or through unsolicited e-mail. By following the option presented, a
customer is directed to information of the provider’s choice. Examples of this method include presenting and tracking the use of banner ads on WWW pages and methods of advertising over e-mail systems, and the submitting of unsolicited e-mail to the customer.

While some of these examples provide advantages, they each have disadvantages as well. From a provider’s perspective these methods can provide links to individuals who are already obtaining information through a network, and the method can be cost effective. In the case of banner ads on WWW pages, the provider may know something of the demographics of the intended audience of the ads and thus this method is similar to other methods of advertising. While an individual customer may occasionally obtain useful information from this technique, it comes at the expense of having to download and view the ads or solicitations.

Unsolicited e-mail is a popular technique for presenting information that, for those that do not respond, is an annoyance that is ignored or possibly a waste of time and resources. The amount of unsolicited email is quite large and is growing. America Online, for example, estimates that about 30% out of the total 30 million emails message a day on the system are unsolicited messages (for further discussion of the burden of unsolicited e-mail, see http://www.cauce.org/).

**Improved Network-Human Interface:** The many deficiencies of above cited art have resulted in recent developments at improving the ability to deliver information or inform customers of information that can be provided. In particular, there have been several inventions directed at providing devices that appear to have more convenient methods of operation and that would thus make information more readily available, or at least make it easier to provide information. Some examples of prior art include systems using a machine-readable code to provide addresses for interactively navigating the WWW. While this type of system may provide some benefits to navigating the WWW, it requires the customer to bring the machine-readable code to a WWW browsing computer, and rely on bar code technology that can be difficult for untrained operators.

Other systems have been developed in which a remote, specialized bar code reading terminal is used. These devices are intended for providing information over a closed network in a market to provide information to shoppers. Yet other systems and
methods have been developed for interactively obtaining electronic information using a specially constructed book-like object, and where electronic information is provided interactively to a customer that is in possession of the book-like device.

In summary, the prior art methods attempt to solve various deficiencies in the art of providing information. However, many of these methods rely on technologies or methods that have limited use. Other systems do not allow the customer to control information gathered by the methods and thus raise privacy concerns. Still other prior art methods and systems provide methods of navigating the WWW require the customer to transport the navigation aid to a computer, or to travel with a fairly bulky device having a display and other electronic components. Yet other methods and systems require that the customer be available to interactive use a computer at the time that an identifying machine-readable code is presented.

Thus there is a need in the art for methods and systems of providing information, or of having information provided, that is readily adaptable to respond to customer-requested information, is expandable to accommodate a large number of customers and information providers, and which allows for the easy generation of requests and for the convenient viewing of information. In particular, there is a need for a method in which customers can easily request information associated with familiar objects in their natural setting, having the information available or presented in a familiar surrounding at the customer’s convenience, and receiving exactly the information requested.

**SUMMARY**

Although many methods have been disclosed in the prior art for improving the delivery of information to customers, especially requested information over computer networks, the art is lacking in methods that are customer oriented, are compatible with portable methods and systems of generating requests, and are expandable to be used by nearly any number of customers. By customer oriented we mean a system and method that allows customers to easily acquire requests for information in nearly any environment using a simple, not necessarily computer connected, device, allows the customer to view the information at his leisure, minimizes the disruption of the customer’s usual behavior in using the invention, and that allows the customers to
individually determine a level of privacy. In addition, the prior art lacks a process for controlling requests and payment for the use of the request-controlling system that is adaptable to a non-interactive computer system.

It is thus one of the many aspects of the present invention to provide methods and systems of filling requests for information that can accommodate a large number of customers and a large number of providers of information. Additionally, it is an aspect of the present invention to provide a method that can accommodate growth in both the number of customers and providers of information, and can control the filling of requests to the benefit of all parties. In one embodiment, requesting information includes acquiring a machine-readable code incorporated onto an object, and where the codes are individually capable of representing one of a vast number of requests. In another embodiment the machine readable-codes are optically readable two dimensional codes, or glyphs, that contain the equivalent of 64 bits of data, which are in turn, in whole or in part, pointers to addresses or pieces of information to be delivered. Information and data is exchanged between services and the customer through computer networks, such as the Internet.

In several of the aspects of the present invention, the method provides for the location of machine-readable codes that are optically distinguished and readable, and wherein the data provided by acquiring the code is associated with the object on which it is located. Embodiments include but are not limited to: having the machine-readable code associated with a business card, and having the fulfilled request include a program that installs the business card information into the customer’s electronic address book; having the machine-readable code located on an advertisement in a magazine, newspaper, billboard, yellow pages, or the like and accompanying either text or a representative picture, and having the fulfilled information contain a web site for more information; having the machine-readable code printed on the border or back side of a photograph, where the information service maintains digital images of the photograph, and where the information is an order for reprints or electronic copies of the photograph; or having the machine-readable code associated with a software product and having the the fulfilled request include a demonstration program that the customer can run.
Another aspect of the present invention provides for a method to assign codes for use by information providers, forwarding requests from customers to information providers, and collecting fees from the information providers for the use of the machine-readable codes. In one embodiment, fees are based on the number of codes read, in another embodiment fees are based on the amount of time for which the codes are valid.

It is yet another aspect of the present invention to provide a method for use with an optical machine-readable code finder that acquires codes through a tapping motion. In one embodiment, the finder is a remote finder, and in another embodiment the finder has a memory that can retain a number of acquired codes, and then wirelessly transmit the codes and a return address as information requests to a service that determines a second service for fulfilling the request to the return address. It is another aspect of the present invention to provide a method for supplying requested information over e-mail or instant-messaging.

Another aspect of the present invention is the aggregation of requests to provide a bundled response that includes an organized response to each individual request. Such aggregation may be implemented at any point in the process that stores or forwards requests.

Yet another aspect of the present invention is the delivery of the information through a web site of a service provider, such that the information may be accessed conveniently by the customer from anywhere on an electronic network, without the need for information to be sent to a particular computer, laptop computer, personal digital assistant, or Internet appliance in the possession of the customer.

Yet another aspect of the present invention provides methods and systems of providing for the privacy of customers. In one alternative embodiment, the information service does not keep records of customer addresses or other protected information as a result of the use of the code.

Another aspect of the present invention provides for control of the amount of information received as the result of acquiring a code. In one embodiment, the code and a return electronic address are forwarded from a decoding service, which interprets the code, to an information service that supplies information back to the customer at an electronic address. In that embodiment the information provider
supplies an agreed amount of information to the customer. Another embodiment provides for the tracking of requests to ensure that each request is sent and filled exactly once or a prescribed number of times.

In another aspect of the present invention, a method is provided to fulfill requests by generating requests, where the requests are generated through the acquisition of a machine-readable code, submitting the codes to a decoding service, where the code is interpreted and associated with an information service, submitting the request to the information service, and having the information service provide the content to the customer through a computer network. In one embodiment the request is sent over the Internet and the content is provided over e-mail.

Another aspect of the present invention provides for authorizing the distribution of machine-readable codes by content providers. This aspect of the present invention further provides for a decoding service to receive requests, determine an information service corresponding to the machine-readable code, and providing the request to the appropriate information service.

Yet another aspect of the present invention provides a method for regulating the user of machine-readable codes by authorizing the providers of content to use the codes for a fee, and providing a service to direct requests to the appropriate provider.

It is an aspect of the present invention to provide a method that is easy for customers to generate requests in a natural context, by acquiring codes affixed to objects connected with the information.

It is another aspect of the present invention to provide a method of organizing the association of machine-readable codes with information providers.

It is yet another aspect of the present invention to provide a method for allowing information to be provided to customers that is easy to manage and flexible to implement, and another aspect that it provides income to the controller of the system.

For purposes of clarity, the invention is described in terms of systems that include many different innovative components and innovative combinations of components. No inference should be taken to limit the invention based on any illustrative embodiment of this specification.
All publications, including publicly available pages on the WWW, patents, and patent applications cited herein are hereby incorporated by reference in their entirety for all purposes. Additional objects, advantages, aspects and features of the present invention will become apparent from the description and figures which follow, and in part will become apparent to those skilled in the art upon examination of the following or may be learned by practice of the invention. The advantages of the invention may be realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be better understood by reference to the Figures of the drawings wherein:

FIG. 1A is a block diagram illustrating a first embodiment of the present invention, in which the acquisition of a machine readable code (a "DOT") by a customer results in the customer receiving information over a computer network;

FIG. 1B is a block diagram illustrating the customer controlled electronic devices of FIG. 1A.;

FIG. 2A is a block diagram of the first embodiment detailing the interactions between issuing authority, one client, and customers;

FIG. 2B is a block diagram of an alternative embodiment detailing the interactions between issuing authority and one client;

FIG. 3 is a schematic of the customer's perspective of the first embodiment showing the acquisition and transmitting and communication of a request, in which a DOT code, a portable finder, and communications to the various services is shown;

FIG. 4 is one embodiment of a machine-readable code incorporated into printed matter according to several of the embodiments of the present invention, in which the machine-readable code is placed to facilitate the present invention;
FIG. 5 is a first embodiment of a portable finder that can be used for reading machine-readable codes and generating requests for information according to the present invention;

FIG. 6A is a detailed view of DOT machine-readable code of the first embodiment, where the DOT is capable of storing 64 bits of data, and which is particularly suited for use with the present invention;

FIG. 6B is a detailed view of a DOT code corresponding to a 64-bit number in the DOT of FIG. 6A, in which the various indices of the DOT code are illustrated;

FIG. 6C is a detailed view of a signal from the finder incorporating the DOT code of FIG. 6A, in which the various indices of the signal are illustrated;

FIG. 6D is a detailed view of a request incorporating the DOT code of FIG. 6A, in which the various indices of the request are illustrated;

FIG. 6E is a detailed view of a forwarded request incorporating the DOT code of FIG. 6A, in which the various indices of the forwarded request are illustrated;

FIG. 7 is a flow chart of the first embodiment of the present invention showing the various steps in fulfilling a request for content;

FIG. 8 is a block diagram of a second embodiment of the present invention illustrating the range of data that can be transferred and delivered between customer, DOT service and content service within the scope of the present invention;

FIG. 9 is a block diagram showing the flow of data through the DOT service corresponding to the block diagram of FIG. 8; and

FIG. 10 is a block diagram showing the flow of data and information through the content service corresponding to the block diagram of FIG. 8.

Reference symbols are used in the Figures to indicate certain components, aspects or features shown therein, with reference symbols common to more than one Figure indicating like components, aspects or features shown therein. The reference symbols used herein are not to be confused with any reference symbols used in the items that have been incorporated herein by reference.

DESCRIPTION OF SPECIFIC EMBODIMENTS

In order to facilitate the description, the following discussion will describe the present invention in terms of specific embodiments of methods and systems of
providing information or content over a computer network. It will be helpful in the discussion that follows to clearly describe some of the terms used herein. The following words are used throughout and are listed along with some basic definitions. It is understood that other, additional or expanded definitions may apply as discussed elsewhere in this discussion adding to these basic definitions:

Customer Refers in general to one or more computer or other electric device end users that are seeking information, are having information presented to them, or are presented with details on how to obtain more or other information.

Information Also referred to as “content,” can be a textual, visual, or audible presentation of information, such as knowledge, news, directions, or definitions, or can be information related to goods or services, such as details about, ordering or reordering information on, or receipt of goods or services. In addition, information on computers can include but is not limited to: a self-contained message; a message having an attachment or a link to direct the recipient to another site on a computer network to obtain further information; a program to execute; information used to reconfigure a computer program; a program that when executed installs or places information in one of the customer’s computer databases; or any of the many other ways that information supplied through a computer network can be read or used by either a person, a computer, or another electronic device that is either connected to the network or otherwise able to receive the information, such as through a separate wireless or wired communication.

Provider Also referred to as “content provider” or “information provider,” is a person, group, business, organization or other disseminator of information. In the context of providing information over a network, the provider may directly provide information from a provider’s computer system, or may supply information to a service that is authorized by the provider to distribute said information. In some of the business models presented herein, the provider is considered to be a
“client” of the those that interpret and forward requests between customer and provider.

Service
An entity that performs actions required for the providing of information. For computer-based methods a service is performed by one or more computers or servers.

Message Service
Any of various protocols, programs or hardware that provides an interface for a customer to handle messages delivered over a network. The handling of messages includes but is not limited to one or all of the following actions: receiving, sending, forwarding, storing, editing, and downloading messages, as well as composing and sending new or reply messages. For the purposes of the subject invention, there are many message services that provide the advantages as described herein. Message services within the scope of the present invention include, but are not limited to: e-mail, instant-messaging, and a “portal web site” offering e-mail services. In addition, a message service can be a combination of methods or systems for delivering messages, thus providing redundancy or the flexibility to provide messages through one or more of the several methods.

**General Description**

The following description illustrates several embodiments for achieving the aspects of the present invention. It will be understood to those of skill in the art that many variations of the various components described in these several embodiments are capable of achieving the aspects of the present invention, and that the invention is accordingly not limited except as described within the scope of the claims. Thus, for example, it is well known in the art that a process performed on or information or data stored in a computer may reside on a single computer, or may reside on more than one computer, especially within the context of shared resources on a computer network. Alternatively, a process, data, or information described as being two processes or databases can reside on just one computer.
Some advantages of the present invention are directed towards methods that allow for a system in which a customer generates requests for information which can then be fulfilled over a computer network. In one embodiment, requests are generated by a customer reading one or more machine-readable codes (or "DOTs") that are each transmitted over a computer network to a "DOT service." The DOT service interprets the code to determine where the requested information is to be found or where it is to be generated and forwards the request to the appropriate "content service." The content service determines the content corresponding to the request and send the content to the customer's address on the network. Depending on the embodiment, the customer can either check a network location, such as an e-mail address or a portal web site, for the requested content, or is notified directly through a protocol such as instant-messaging.

Some advantages of the present invention are directed towards allowing the customer to retain privacy of customer information that might be directed over the network as a result of using the methods and systems of the present invention. In the context of the present invention, customer information includes, but is not limited to general demographic or personal information such as name, electronic or mailing address, phone number, income, identification numbers, credit card numbers, gender, geographic location, zip code, or statistically derived customer information. The methods and systems of the present invention lend themselves to guarding the privacy of customers by restricting the customer information between various services. Several of the embodiments include various privacy levels, controllable by the customer in some embodiments, that control divulging customer information. The strictest privacy level does not allow the content service to retain any customer information, including the electronic address to which the requested content is sent.

The addressing data for directing and fulfilling requests is partially contained within the numerical code that is encoded within each machine-readable code. The machine-readable code contains an encoded representation of data such as an alphanumeric string or a number, and can in general be considered to be a "numerical code." It will be appreciated by those of skill in the art that many types of machine-readable codes can be used to achieve the advantages of the present invention including but not limited to optical codes, and other non-optical codes, such as
magnetic codes that are distinctive or that can be associated with or incorporated into distinctive printed marks.

As an example of the present invention, several advantages are achieved in part by supplying machine-readable codes within print media, generating numerical codes from the machine-readable codes with an electronic finder, directing the numerical codes and other information to a content provider, and supplying information from the content provider that is associated to the print media in which the machine-readable codes is incorporated. The information supplied can be used directly by the customer or can be used with or by the customer’s computer or other electronic devices. An example of a machine-readable code and finder is described in U. S. Patent Application Serial Number 09/616,265 to Rubin et al. filed on July 14, 2000 and titled Compact Matrix Code and One-Touch Device and Method for Code Reading, which is hereby incorporated by reference. The machine-readable code and finder as described herein and in Rubin et al. are exemplary in that they provide a distinct and compact machine-readable code that is readable with electronic devices that are inexpensive, easy to use and which transmit requests obtained at remote locations without the further action of the customer. The code of Rubin et al. is particularly useful in promoting the advantages of the present invention in that the code can be used within current printing technologies and techniques. Thus information necessary for printing the code can be made available over a computer network to a printer in a standard file format to be incorporated into standard printed media using conventional inks and papers, much as the incorporation of other objects into printed media. The code can thus be printed with a minimal impact on the work flow of the print industry. It will be appreciated that some or all of these attributes aid in the promotion and acceptance of the present invention.

An important advantage of the present invention is achieved through the association of the machine-readable code with information to be obtained by generating a request using the machine-readable code. The methods and systems of the present invention thus add value to the print media, be it of a commercial, educational, or informational nature. General areas of use of the present invention include, but are not limited to identification of people, objects or information and automation of software or hardware actions. It is within the scope of the present
invention, though not limiting, that information be provided as a result of generating requests by acquiring machine-readable codes according to the following associations: more information about the items within or associated with an advertisement or other information print media from a machine-readable code on that media; information on goods or services, such as pricing, availability, options or choices from a machine-readable code on an article for sale or in a catalog; for use as a sales, marketing or promotional device by incorporating a machine-readable code onto such devices; receiving event-related information from a machine-readable code on an events listing in a newspaper, magazine, or flyer; electronic listings of or more information about organizations having machine-readable codes on a business card or directory listing; more or electronic versions of information associated with machine-readable codes on a map or in a dictionary, thesaurus, almanac, encyclopedia, cookbook, reference or text book; aiding commerce though machine-readable codes on coupons, bills, envelopes, or to facilitate purchasing of goods or services; and obtaining directions to a place according to the location of the machine-readable code.

The use of an code that is easily incorporated into print media, as with the code of Rubin et al. is that the code can become ubiquitous have the advantage of using to generate a census or inventory. Thus a questionnaire could be responded to by tapping DOTs corresponding to purchased items or other objects that incorporate the code. This feature is particularly useful for market research and poll taking.

**An Embodiment of the Present Invention**

It is useful to consider specific embodiments of this invention as a basis for this discussion. As one such example, FIG. 1A is a block diagram illustrating a first embodiment of the present invention, in which the acquisition of a machine readable code (a “DOT”) by a customer results in the customer receiving information over a computer network. In the first embodiment, customer 101 generates a request for information through the acquisition of a machine-readable code, or DOT 109 using electronic devices 113 and a finder 117. In particular, finder 117 is capable of reading DOT 109 and generating the corresponding DOT code 127. Also shown in FIG. 1A are: one or more content services 107 (individually 107-i where i varies from 1 to N) which are individually associated with fulfilling a given DOT code 109; an
issuing authority 105 which creates, controls, governs, regulates, or oversees the DOT codes and the forwarding of requests from customer 101 to an associated content service 107-i through a DOT service 103; and a computer network 115 through which customer 101 communicates with DOT service 103 and content services 107-i.

In addition, several of the communication paths are also noted on FIG. 1A as signals A through G. Following the acquisition of DOT code 109, finder 117 regenerates DOT code 127 associated with DOT code 109, and sends signal A to electronic devices 113. Signal A includes a representation of DOT code 127 which includes data that is used to request information. Finder 117 of the first embodiment is used to gather multiple requests, and thus signal A may contain data about some or all of the multiple requests. In addition to DOT code 127, signal A can include some or all of the following data: data specific to finder 117, discussed subsequently, such as an identification number or the state of various buttons or switches the finder to indicate specifics regarding how or when requests are to be handled by electronic devices 113, computer network 115, DOT service 103 or one of content services 107; data used to determine a time stamp of the acquisition of a particular DOT; and quality control data.

Additional details of electronic devices 113 are shown in FIG. 1B. In particular, electronic devices 113 are shown to be in communication with finder 117 for acquiring a machine-readable code 109 and include a transceiver 119 for communicating with finder 117, a portal device 121 adapted to communicate over computer network 115, and a display 123. Also shown in FIG. 1B are additional communications pathways A', G', and H to be described subsequently.

Electronic devices 113 process signal A to form request B. Request B can either be multiple individual request signals or one signal having multiple requests. In the first embodiment, with customer 101 is associated with an electronic return address, or customer address 125. Customer address 125 is added to or associated with signal B for the fulfilling of the request over network 115. Electronic devices 113 then forward request B, through computer network 115, to DOT service 103. DOT service 103 has a look-up table or other devices for associating each DOT code 127 with a particular one of content services 107. In particular, DOT service 103 associates request B with a particular content service 107 for responding to the
request, and forwards at least a portion of request B to an associated content service 107-i as forwarded request C-i. In an alternative embodiment, DOT service 103 incorporates customer address 125 into forwarded request C-i through an association based on finder specific data, communicated according to methods and systems described subsequently, or by other forms of customer address identification provided by electronic devices 113 or through computers associated with computer network 115.

Content service 107-i determines an appropriate response based on the request and sends a content message D to computer network 115, specifically delivering the content message to customer address 125. Customer 101 can then perform a content check E to receive the requested information. Customer address 125 is a customer accessible network or computer address assigned to or chosen by customer 101, and can include but is not limited to an e-mail address, instant-messaging, a portal web site on the Internet, a customer code, telephone number, or any other electronic technique for making information available to a targeted customer. In addition, customer 101 may have multiple customer addresses which one of the content services or another computer on network 115 can use to direct content messages D.

As a first example of message delivery, customer 101 has only one customer address 125, that is one message service, that corresponds to an e-mail address, such as is provided by a POP server or a web site configured to provide e-mail services. As a second example, customer 101 has two customer addresses – the first being an instant-messaging message service address, and the second an e-mail message service address, as in the first example. An exemplary message delivery system would attempt to use the instant-messaging address, and failing that delivery would deliver to the e-mail address. The delivery attempts can be managed either by one of the message services, which can forward messages automatically or based on a failure to deliver, or through another service, such as a DOT message service (not shown) that receives all requests and forwards them accordingly. Another embodiment of message delivery of the present invention allows customer 101 to change or modify the various aspects of mail delivery, such as addresses, allowing aggregation so that many messages are delivered at the same time, forwarding instructions, and many other functions performed by message services.
Signal F is an optional confirmation signal used for electronic devices 113 to keep track of received requests. In one embodiment, finder 117 retains acquired DOT codes 127 within a memory, described subsequently. Signal F contains data that can be used to identify individual DOT codes, such as the original code with a time stamp, indicating that a particular DOT code has been received by DOT service 103, and should be deleted from memory.

Network 115 can be any computer connection between electronic services 113, DOT service 103, and content services 107, such as the Internet or other computer networks. In additional embodiments, A – F could each be through different channels of communication, including open networks (such as the Internet), closed networks, or within a single computer, and achieve the advantages of the present invention. For example, B and F could be through direct wireless communication to DOT service 103, while D and E are a direct wireless communication back to customer 101. Alternatively, DOT service 103 and content services 107 could be on one computer. Signal C would thus be a signal internal to the DOT service/content service computer.

In one embodiment within the scope of FIG. 1B, portal device 121, transceiver 119, and display 124 are contained within a personal computer, while finder 117 is a portable device having a memory that can accumulate multiple requests to be transmitted A back to transceiver 119 when convenient or when finder and transceiver are within range of one another. In another embodiment, finder 117 is adapted to only send signal A and not receive signal G, and transceiver 119 is a receiver.

The various aspects of the present invention can be achieved with many combinations of electronic devices. Several of the many combinations are: portal device 121, transceiver 119, and display 123 could be incorporated into a laptop computer; portal device 121 and transceiver 119 could be incorporated into a personal digital assistant; or customer 101 could have more than one electronic device 113, one for submitting requests and a second for receiving information. Other portal devices 121 include but are not limited to web-connectable devices including an Internet appliance, a global positioning system, a personal digital assistant, a telephone, a pager, a set-top box, a network hub, a modem and a networked device on an Internet-connected network. A variety of displays 123 that can be connected to the web are appropriate for use with the present invention. Examples of displays 123 include but
are not limited to a personal computer, a laptop computer, an Internet appliance, a
global positioning system, a personal digital assistant, a telephone, a pager, a set-top
box, a television, a videocassette recorder, a television server, a pair of goggles, a pair
of glasses, a helmet, or a display with a few indicator to represent a limited amount of
information.

In addition, the communication of information described herein between the
various components used to achieve the advantages of the present invention may be
performed by a variety of technologies, methods and techniques. The scope of the
present invention is not intended to be limited by those technologies, methods and
techniques, used singly or in combination, used to achieve the advantages of the
present invention. In particular, communications among individual ones of the
various components may include but are not limited to be by wires, optical fibers,
microwaves or other radio frequency technologies, or infrared or other optical
technologies.

**Exemplary Machine-Readable Codes and Finders**

The discussion will be further facilitated, and a better appreciation of the
operation of the present invention will be achieved, following a discussion of
machine-readable codes for use with this invention. The use of specific machine-
readable codes and code finders is not meant to limit either the scope of the present
invention, or the claims except where specifically limited therein.

**Machine-readable Codes**

In general, machine-readable code can be any machine-readable code,
preferably one that has devices for easy reading by the general public. Each machine-
readable code symbolically encodes a number, which can be decoded using an
electronic reader, or finder. More specifically, a number is used to generate a
machine-readable code, and the finder reads the machine-readable code to generate a
number. For ease of use the machine-readable code should either be an optical code
that is easily recognizable, or if the machine-readable code is not optical, it should
have an optical component that allows for easy identification and acquisition. The
machine-readable code and finder of Rubin et al. is used here as example, albeit
exemplary, of devices that will achieve the advantages of the present invention.
Rubin et al. describes a machine-readable, optical matrix code, or glyph capable of symbolically encoding a numerical code and a finder that can be used for reading the machine-readable code and generating a numerical code. As a way of illustrating the present invention, the DOT (or machine-readable code), DOT code (or numerical code) and finder (or reader) as described herein and in Rubin et al. will be used throughout the following discussion. In light of the this discussion, it would be obvious to one skilled in the art that other machine-readable codes could be used to practice and achieve the advantages of the present invention. In addition, other DOT codes could be configured or interpreted so as to achieve the many advantages of the present invention.

FIGs. 3 and 4 present more detailed views of one embodiment of the DOT and associated apparatus for reading and transmitting the DOT code. In particular, FIG. 3 is a schematic of the customer's perspective of the first embodiment showing the acquisition and transmitting and communication of a request, in which a DOT code, a portable finder, and communications to the various services is shown, and FIG. 4 is one embodiment of a machine-readable code incorporated into printed matter according to several of the embodiments of the present invention, in which the machine-readable code is placed to facilitate the present invention. DOT 109 is affixed or otherwise associated with a physical object as arranged by one of many clients 107. In general, there is a plurality of DOTs 109 available for acquisition and there may be multiple copies of the same code for acquisition. In FIG. 3, DOT 109, shown on a print media 207, is being acquired by finder 117. One possible placement of DOT 109 on print media 207 is shown in FIG. 4. Many placements of DOT 109 are possible for association with various types of information to be requested, as discussed previously.

FIG. 6A is a detailed view of DOT machine-readable code of the first embodiment, where the DOT is capable of storing 64 bits of data, and which is particularly suited for use with the present invention. As shown in FIG. 6A, DOT 109 includes propellers 601 and reserved white areas 605 to assist finder 117 in locating the DOT, and hexagonal cells 603 which contain binary data according to the state (black or white) of the individual cells, additional targeting data and cells reserved for quality control purposes. FIG. 6B is a detailed view of a DOT code corresponding to
a 64-bit number in the DOT of FIG. 6A, in which the various indices of the DOT code are illustrated. In particular, FIG. 6B shows a 64-bit DOT code 127 consisting of a content service index 607 and a content index 609. As described subsequently, content service index 607 is used by DOT service 103 to direct the request, including data related to content index 609 to one of the particular content services 107, and data related to content index 609 is used by the particular content service to generate the requested information.

Alternatively, DOT code 127 may have more or fewer bits, or may be comprised of different types of data. In a first alternative embodiment, the two indices, namely said content service index 607 and said content index 609 are one index that is interpreted by DOT service 103. In a second alternative embodiment, there is more than one DOT service, and DOT code includes a DOT index to direct the request from a receiving DOT service to a DOT service that directs the request to a content service. In a third alternative embodiment, DOT code includes an aggregation index that is used by a DOT service, a content service or a network computer to aggregate request responses. In a fourth alternative embodiment, finder 117 is used in conjunction with a computer game where the finder communicates with other finders, and the DOT code includes game related information. In a fifth alternative embodiment, the DOT code contains commands that are interpreted directly by either finder 117 or electronic devices 113, allowing for local operation of DOT and finder.

In a sixth alternative embodiment, the DOT code contains one or more bits that govern the dissemination of code information according to multiple DOT services 103. Thus a code can be considered to be public or private, for example. A private code may be readable only by specific DOT service, while a public code may be readable by any DOT service 103 that acquires the code. The implementation of this embodiment is dependent on finder 107 establishing communications with DOT service 103, scrutinizing the DOT code and sending the code based on the level of code privacy. Public codes are useful in public settings, such as markets or trade shows, where customer 101 understands that information is to be exchanged. Customer 101 may wish for the codes obtained within the public setting to be transmitted, while wishing that other codes obtained outside of the public setting are not to be transmitted.
Finders for Machine-readable Codes

FIG. 5 is a first embodiment of a portable finder that can be used for reading machine-readable codes and generating requests for information according to the present invention. The embodiment of FIG. 5 is a portable, personal, electronic device that reads codes and holds the data until it can transmit the DOT code to an external computer. The apparatus and operation of some aspects of finder 117 are discussed in Rubin et al. For the purposes of the present invention important features of finder 117 include: a battery 517, an optics assembly 501 having a two-dimensional image sensor 505, an LED illuminator 507, a processor 509 in communication with sensor 505, a memory 511 for storing images, and wireless electronics 515 for transmitting data to external devices that is connected to an antenna 307, which may be partially external to case 301, and a feedback LED and/or audio PZT 513 to communicate back to the user of finder 117. Internal to optics assembly 501, though not shown, are other optical components know to those skilled in the art of image acquisition including, but not limited to: lenses or other imaging optics to image DOT 109 on sensor 505; mirrors, prisms or other devices for shortening the physical dimensions optics assembly 501; optical filters to limit the optical spectrum to be imaged; and windows for sealing other optical components from the effects of the external environment. Wireless electronics 515 can include any of the various communications technologies well known in the art of wireless communications for transmitting signals, including but not limited to infrared (using protocols such as IrDA) or other optical technologies, acoustical, and radio frequency technologies.

External to or on case 301 of finder 117 is a finder tip 303 which includes a front surface of transparent nosepiece 519, a tip switch 305. Nosepiece 519 may be visually clear and is used for illuminating and imaging DOT 109, and also allows for aligning and assurance of proper working of finder 117 by the user of the finder. Other additional buttons, switches, dials or other settable electronic components that are not shown may also be incorporated into finder 117 for transmitting customer selectable information from the finder.

Processor 509 controls the electronics of finder 117, including sensor 505, image processing and communications. In communication with processor 509 is memory 511, which is used to perform many important functions in finder 117.
Specifically, memory 511 is used to hold operating instructions for finder 117 and to hold code data for later transmittal. Memory 511 may consist of read-only or erasable, programmable memory to hold the firmware, read/write memory to hold the code image during processing and for other uses, non-volatile memory to hold code data, finder serial numbers, time stamps and other data stored during power-down or power-off, and any combination thereof.

Finder 117 of this embodiment can be adapted to read a variety of optical codes for use with the present invention, including bar codes, such as U.P.C., stacked codes, and matrix codes, including the DOT code of Rubin et al. as shown in FIG. 6A-E. In addition to providing a DOT code, space is reserved for quality control purposes. The finder works in cooperation with the DOT, and in addition to the DOT code, the finder may transmit an image of quality control cells and/or the entire image as a monitor of the quality of DOT printing and reading. Other uses of the quality control cells and the overall image are the determination of quality-related performance parameters, including but not limited to: paper quality, paper whiteness, ink uniformity, ink color, ink bleed, image orientation, illumination uniformity within said finder, temporal illumination variations, alignment between said code and said finder, image size, image aspect ratio, image focus, optical quality, source of reading errors, and alignment of said finder by said customer.

**Operation of the Finder**

To acquire DOT 109 as shown in FIG. 3 customer 101 places finder body 301 approximately perpendicular to media 207, bringing finder tip 303 in contact with DOT 109 through tapping motion 111, activating tip switch 305. Customer 101 is aided in the correct positioning of finder 117 over DOT 109 by transparent nosepiece 519, which allows the customer to view the DOT as the finder is placed for DOT acquisition. Switch 305 increases power to finder 117 and indicates to processor 509 that the DOT is to be read. In addition, power is supplied to LED illuminator 507 for illuminating DOT 109 for a period of time through nosepiece 519. DOT 109 is imaged through nosepiece 519 by optics assembly 501, which produces an image of the DOT onto sensor 505. In another alternative embodiment finder 117 includes a switch on the side of body 301 for activation of the reading of DOT 109. The finder is placed over, and preferably on top of DOT 109, and the tapping motion 111 is the
pressing of the button. In another alternative embodiment, finder 117 is incorporated into electronic devices 113 such that the communications A and G are wired communications.

When finder 117 is within wireless range of personal computer 309, which includes the other electronic devices 113, namely transceiver 119, portal device 121 and display 123, wireless communications A and G can be established and data can be transmitted between the finder and the other electronic devices. In the first embodiment, finder 117 retains previously acquired DOT codes 127 for a period of time, and does not generate a request if the DOT code has been recently acquired. This feature, which can be turned on or off through settings of finder 117, prevents the customer from receiving multiple responses in the event of inadvertent multiple acquisitions.

Once finder 117 has acquired a code, an important aspect of the present invention is to provide feedback to the user by a signaling of the correct reading of the code. Feedback 513 is provided by audio, visual, vibration or by combinations thereof indicating a successful reading of the code. Additionally, signaling to the user may take place through other means. Confirmation of an attempted read can take place either through the tactile sensation of switch 305 being toggled, while visual cues can be communicated through a variation in the illumination from LED illuminator 507 or by other signaling LEDs (not shown) included in finder 117. Another aspect of finder 117 and electronic devices 113 is keeping track of which requests have been fulfilled. This optional confirmation signal F, which alerts electronics under the control of customer 101 that a DOT service 103 has received request A, can perform various monitoring functions. In one embodiment, memory 511 may be instructed to hold copies of acquired DOTs until a corresponding confirmation F is received, at which time the copy of the particular DOT is erased. In another embodiment, memory 511 is instructed to resend DOTs that are not confirmed within a given time frame.

**Alternative Finder Embodiments**

Finder 107 can also incorporate other features and modes of operation to aid in its use. In one embodiment, wireless electronics 515 is capable of receiving signals. By receiving signals, finder 107 can perform additional functions which are
advantageous, such as: providing feedback 515 and erasing received codes from memory 511, as previously discussed; downloading software updates or additional software for execution by processor 509 for new or improved operation of the finder; notification that battery 517 may be in need of replacement; or notification; or feedback for the playing of a finder-based game. Finder 107 may also contain an alphanumeric or other display device (not shown) for communication or notification to the user. Additionally, finder 107 may also contain buttons, switches or other input devices (not shown) for either modifying the function or action of the finder, such as selection of a particular feedback 513, or for altering the retention of codes in memory 511. In addition, such input devices (not shown) can also transmit data that modifies the interpretation, modification or activities performed in conjunction with finder 107 operation or interpretation of the code 109 by other electronic devices (not shown). Thus a button may indicate that the user wishes to be responded to at one location or another, may want to transmit limited amount of data, such as finder data that can be traced back to a particular user.

In another embodiment, DOT code 127 can be interpreted by electronics (not shown) within finder 117 and acted on by the finder or by other network devices, computers or appliances. Thus for example, finder 127 can be provided with software or hardware setting, or the requested information can be transmitted to one or more other electronic devices that perform tasks based on the transmission. Thus the methods and systems of the present invention can be used to request information from or program, run or otherwise control or interact with household electronics, utility meters, or other computer systems.

In addition to the tapping motion 111 for acquisition of DOTs 109, other positive actions for reading DOTs or other codes provide the feedback to customer 101 necessary to instill confidence of a code having been read. Thus an additional finder embodiment reads a code through a sliding motion, possibly coupled with a tap, for acquiring a code.

In addition to the components described, it would be obvious to one skilled in the art that a finder having the functions and components described herein require miscellaneous electronic, electric and mechanical components to support the above
major elements, and thus a finder of the present invention may contain equivalent structures to achieve the various aspects of the invention.

**Operation of the Present Invention – DOT Acquisition, Request Generation, and Finder Communication**

An understanding of the operation of the present invention is aided by the consideration of the following embodiment of FIG. 1A and 1B, the consideration of which is not meant to limit the scope of the present invention. Specifically, the operation will now be described in terms of one embodiment of DOT and finder, those found herein and in Rubin et al. Customer 101, who has finder 117 in her possession, comes in contact with print media 207 having DOT 109 affixed thereto. Customer 101 acquires DOT 109 by contacting, or tapping 111 the DOT finder 117. With this action, customer 101 has begun a chain of events for receiving requested information. The two-dimensional sensor 505 converts the image of DOT 109 into a two-dimensional digital image that, in one embodiment, stores the image as a monochrome, 352 x 288 pixel image, using one byte per pixel. Electronics and software, as described in Rubin et al., convert the image of DOT 109 into DOT code 127, which, for example, could be a 64-bit number encoded through a series of steps including but not limited to a (19,11) Reed-Solomon Forward Error Correction Algorithm and cryptographic encoding, into a 114-bit number for storing in a DOT. The DOT is capable of holding more data (114 bits) than the 64-bit number associated with the DOT, allowing for error correction and other features that provide robustness to the DOT as an optical glyph.

In addition to acquiring DOT 109 and generating DOT code 127, electronic finder 107 also gathers or otherwise associates other data into signal A. Details of the signal A are shown in FIG. 6C, which is a detailed view of a signal from the finder incorporating the DOT code of FIG. 6A. The signals and requests of FIG. 6 are schematic and are used to represent the content of the respective signals and requests. Alternative embodiments may include encoding or scrambling of communications, and thus the placement or arrangement of data within the schematics are not to be taken as actual locations of the indicated data.

Other data may also be added to the signals to aid in communication of the various signals and requests described herein. In the first embodiment, finder 117
images one or more quality control cells, which are one or more of hexagonal cells 603. The images of these cells are used by the DOT service 103 or associated computer to determine among other properties the quality of print, paper, finder, and customer operation of the finder. The quality control cell image is converted to a digital representation in finder 117, which is included into signal A as quality control data 611. A finder ID 613 is also included into signal A, as are a digital representation of one or more finder settings 615. Finder settings 615 configured by customer 101 using switches, knobs, buttons, or other input devices (not shown) on finder 117. Finder settings 615 may communicate various preferences from finder 117 to electronic devices 113, computer network 115, DOT service 103, content services 107, or to a computer at customer address 125. Other finder settings may set the response or action of the finder 177, such as turning a notification signal on or off, and may or may not be communicated in signal A. Finder settings 615 include but are not limited to: controlling the amount of customer information, such as personal information or demographic data, that electronic devices 113 or DOT service 103 can pass on with a request or forwarded request; specifying one of a few possible customer addresses 125; and specifying the range or use of requests. Also included in signal A is a time stamp 617 which is used to determine the time at which DOT code 127 was acquired. Time stamp 617 can either be an absolute signal giving the time, or can be a relative signal that is calibrated by electronic devices 113 to determine the actual time of acquisition.

Finder 117 can be used to acquire one or more DOTs 109 which may accumulate in memory 511. The acquired DOTs, as well other data either acquired or indicated by settings on finder 117 are communicated to transceiver 119. In the first embodiment, electronic devices 113 are a personal computer having a transceiver 119 that is programmed to either periodically or continuously seek out signals from finder 117. Electronic devices 113 include a computer program that runs in the “background” and executes a series of commands when finder 117 is within range without user intervention.

Finder 117 transmits, when in range of transceiver 119, some or all of the acquired DOT codes 127 to electronic devices 113, where a request B is prepared. Specifically, electronic devices 113 process signal A to produce request B. FIG. 6D is
a detailed view of a request incorporating the DOT code of FIG. 6A, in which the various indices of the request are illustrated. In particular, request B includes DOT code 127, quality control data 611, and finder 613 from signal A. In addition, request B includes customer settings 619, which may include all, part or none of finder settings 615 from signal A, as well as additional data added by electronic devices 113, an acquisition time stamp 621, which time stamp 617 from signal A in a standard format, a portal time stamp 623 indicating when the request was sent, and customer address 125. It will be understood by one skilled in the art that the request of the first embodiment can be generated using techniques or signals that give equivalent results.

Thus one alternative embodiment has customer address 125 not included in request A but includes, as an example, the return address of an e-mail request.

In addition to the flow of data from finder 117 to DOT service 103, data and instructions may flow from DOT service to electronic devices 113 or the finder. In another embodiment, feedback 513 is provided to indicate the successful reception, acceptance or actions performed by the reception of the DOT 109 electronic devices 113, computer network 115 or DOT service 103. This indication can be in the form of a received signal F having the same DOT code and/or time stamp of a DOT 109 in memory 511 or in the memory of electronic devices 113. The reception of this indication can be used to trigger feedback 513 and erase from memory 511 stored DOT 109.

**Operation of the Present Invention Regarding Various Request Fulfilling Aspects**

Following the receipt of signals A representing one or more requests, the requests B are sent through computer network 115 to a DOT service 103. Dot service 103 then determines the content service 107-i that is capable of responding to request B and directs a forwarded request C-i to content service 107-i. In the first embodiment there is one DOT service 103 for handling all requests. Specifically, DOT service 103 uses content service index 607, which is part of DOT code 127 to redirect the request. In one implementation, DOT service 103 uses a look-up table to
determine the address of content service 107 to which the forwarded request C is to be sent. DOT service 103 can either maintain the appropriate look-up table or receive it from another source. FIG. 6E is a detailed view of a forwarded request C incorporating the DOT code of FIG. 6A, in which the various indices of the forwarded request are illustrated. Included in forwarded request C is content index 609, acquisition time stamp 621, portal time stamp 623, customer address 125, and customer information 625, if any.

In another embodiment, there are multiple DOT services (not shown), and an alternative DOT code that directs requests to one of the DOT services. For example, an alternative DOT code contains a DOT service index that is interpreted either by electronic devices 113 or a primary DOT service to direct the balance of the request to a secondary DOT service. In yet another embodiment, the DOT services are determined based on which particular finder is used or a determined location of the customer.

At some point before forwarding B-i, customer address 125 has been incorporated into or associated with request A. It is important that content service 107-i is informed of return address 125, and there are many equivalent methods for accomplishing this. As previously discuss, one embodiment has portal device 121 incorporate the customer address 125. There are many other embodiments of the present invention can achieve the advantage of supplying information in this manner. These include, but are not limited to: sending the request as an e-mail with customer address 125 as a return address; including the customer address along with request B in an e-mail message; or sending the request B in one e-mail message and the customer address in a second e-mail message, where both the first and second e-mail messages have a common identification number for later association of request B with the return address. In another embodiment, return address 125 of customer 101 is associated with a unique identification number of finder 117 in DOT service 103. Transmission A includes the finder identification number, which is forwarded along with the code as request B. Dot service 103 looks up customer address 125 associated with a particular finder 117 and includes the customer address with forwarded request C-i.
Forwarded request C-i may contain customer information, as described previously, in addition to the data of request B. It is one aspect of the present invention that the customer is provided with some degree of control over the customer information divulged to content services 107. There are many embodiments within the scope of the present invention that are directed towards providing customer control of her customer information. Thus through an input device on finder 117, within electronic devices 113, or within DOT service 103 there is an indication of a degree of privacy. Under the highest degree of privacy, customer address 125 is used by content service 107, the customer is only sent one response for each request, and no record of the customer address is retained by the content service. At the other extreme of privacy, customer information such as phone numbers, gender, income, etc. has been agreed to be included with forwarded requests, and the content service 107 can use the customer information as it sees fit. Additionally, purchasing data, such as credit card numbers, may be sent with proper authorization.

The forwarded request C-i contains at least enough data for content service 107-i to fulfill the request for information, namely an indication of what information is requested and an address to which the information is returned. Content service 107-i can work in various ways that are within the scope of the methods and systems of the present invention. Content service may have only one DOT code assigned to it, and respond to all customer's addresses 125 with the same message. Thus content service 107-i might send, for example a standard e-mail address to the customer address 125. Alternatively, content service 107-i may use various data to customize the response. Content service 107-i may have multiple DOTs which are geographically distributed, or have certain DOTs appearing in certain predictable locations, such as in particular magazines, or may be allowed to obtain a time-stamp on the acquisition of the DOT. In this way content service 107-i could customize the information content without acquiring any customer information directly.

Alternatively, content services 107-i could use other data to personalize or customize content D. The agreement could be a blanket agreement on all DOTs, could be based on customer information supplied to DOT service 103 on a DOT-by-DOT basis, such as through a switch on finder 117, for example, or could be a pre-agreed upon method of providing the information. Assuming that customer 101
agrees to have customer information divulged, DOT service 103 adds customer information request B in formulating forwarded request C-i. Customer information includes but is not limited to general demographic type information (gender, geographic location), may be more personal (name, income, mailing address, phone number), and an authorization to charge a credit card account. The ability of the customer to control the amount and nature of personal information divulged to content providers is one way to build trust in the methods and system described herein and thereby promote use of the system.

Information provided is selected to respond to the request that generated it. Some examples of the types of content D include: DOTs on advertisements resulting in further information, such as an e-mail or web page, containing information about a product; DOTs on business cards resulting in content that is a program that adds the contact information into a personal database; DOTs on maps being associated with geographic information such as giving directions, travel information, or information on a place depending on the context in which the map appears; DOTs for branding giving biographical, historical, financial, or other personal interest information; DOTs the instruct the execution of a software program that performs a described action such as faxing a document; and DOTs on personal photographs resulting in the e-mailing of a partially pre-filled out reorder form for reprints of the photograph.

Content D thus sent, customer 101 can use electronic devices 113 at her disposal to connect to computer network 115 and access an account at address 125. In the case of an e-mail account, this may involve executing an e-mail program to check for messages. For systems having instant-messaging, this may involve customer 101 receiving an instant message if he is network connected, otherwise having an e-mail sent to an e-mail account. One of many other possibilities for receiving messages that would be obvious to one skilled in the art, would be a portal web site having a personal space for customer 101 to receive content at message 125. The portal web site could be maintained by the customer's Internet Service Provider, by or in conjunction with the DOT service 103, or by another party. In one embodiment, DOT service 103 provides a portal web site that incorporates personalized ads according to the DOT codes which the customer has acquired.
Operation of the Present Invention and Cooperation between the Issuing Authority Clients and Customers

The operation of the present invention will now be discussed in greater detail in terms of the interchange of information, data, services and money between client 107, issuing authority 105 and customer 101. Thus according to the embodiment of FIGs. 1A and 1B, customer 101 receives information from one of clients 107 through intermediary DOT service 103 that is controlled by issuing authority 105. An alternate and equally valid view of the method of the present invention is that it allows clients 107 to present information to customer 101, with issuing authority 105 controlling, overseeing or otherwise monitoring or manipulating a plurality of DOT codes 109.

FIG. 2A is a block diagram of the first embodiment detailing the interactions between issuing authority, one client, and customers. In the first embodiment, issuing authority 105 controls, supervises, delegates or otherwise deals with the control of machine-readable codes, the interpretation of requests, and the forwarding of requests to the proper content service. In addition to the components, data, and information of FIG. 1, FIG. 2A includes an organization findtheDOT 201 that coordinates some of the issuing authority 105 processes, a request database 203 used by findtheDOT 201, a client or content provider 205 that has information to be provided by the methods and systems of the present invention, a print media with DOT 207 that is issued under the authority of the client to distribute individual machine-readable codes, and a service at customer address 209 that the customer 101 can access over computer network 115 to obtain the requested information. Content service 107 is a content service that provides the electronic services necessary to participate in the methods and systems of the present invention, namely a networked computer or computers what are adapted to receive requests, are able to process the requests, and are able to fill the requests as described herein. Content service 107 may be related to or controlled by several embodiments that each achieve the advantages of the present invention. As one example, content service 107 could be owned and controlled by content provider 205. As another example, the content service 107 could be provided by the issuing authority 105 as an added service to content provider 205. Additionally, content provider 205 may be an organization wishing to distribute information directly, or it
may be a service organization, such as an advertising agency, that provides for information to be distributed.

FIG. 2A shows several additional communications labeled J through U. Content provider 205 approaches findtheDOT 201 for arranging to use the many aspects of the present invention to deliver information over a computer network. In one embodiment, content provider 205 is provided with several options for distributing DOTs that allow for the generation of requests for information corresponding to a customer’s reading of the DOTs. Thus for some uses, content provider 205 may be given unlimited use of the DOT for cost. Alternatively, content provider could be allowed unlimited use of DOTs for a set period of time, for a given purpose, or even a per DOT use over a fixed or limited period of time. In any case, content provider 205, in J, presents a computer network address for content service 107, which will be supplying content over computer network 115. In preparation for distributing DOTs 109, in K findtheDOT 201 provides content provider 205 with data necessary to print the DOT and a content index 609, and supplies, in L, DOT service 103, with DOT code 127, or at least content service index 607 for redirecting requests, and address of content service 107. The data necessary to print the DOT is in N supplied to a printer for inclusion with print media, and in M the content D and content index 609 are supplied to content service 107. In P print media with DOT 207 is supplied to or come in contact with customer 101, allowing the customer to acquire DOT 109, as discussed previously with regard to FIGs. 1A and 1B.

At this point, DOTs have been distributed to customers, who can use finders to generate requests for information. As previously discussed, requests B and the associated responses C through F may occur, as previously described. On some schedule, issuing authority 105 executes an accounting program to determine the cost of permitting the use of DOTs 109 by content provider 205. To this end, DOT service 103 acquires R, request data in request database 203. Request data includes at least a table or other accounting of at least some portion of the DOT codes for which a charge is made. In S this accounting is provided to findtheDOT 201. The data S is used by findtheDOT 201 to generate bills T to content provider 205, who then reciprocates, on a timely basis, with payment U.
An alternative embodiment of the present invention is shown in FIG. 2B. In this embodiment, code usage is monitored by findtheDOT to create a proprietary database including but not limited to code acquisition time, frequency, locale, media on which code appeared, zip code, and other recent codes processed. Access to the database is provided, sometimes for a fee, to improve the usefulness of the codes or other metrology applications. The embodiment of FIG. 2B illustrates findtheDOT 201 providing DOT usage information V in return for payment W from the client 205.

As an alternative to the embodiment of FIG. 2 note that an embodiment within the scope of the present invention is for DOT service 103 or findtheDOT 201 to host the content service 107, possibly for a charge, and that in that embodiment content provider 205 would provide actual content to the other party instead of an address of a content service. In another embodiment, communication K provides data that is passed through unaltered to two other services, and thus the data in K could be passed directly through to content service 107 (M) and to a printing service to produce print media with DOT 207 (N).

The various aspects of the present invention allow the embodiment of FIGs. 1 and 2 to be extended to a great number various services and customers. The DOT code as described herein and in Rubin et al. is capable of representing more than \(10^{19}\) unique codes, and the code has been designed for easy replication on a variety of print media. These features of the DOT code allow for suitability of being a market standard and of being ubiquitous. The large number of unique codes, when used in conjunction with the present invention, allows for codes that used once (re-use in not necessary). In addition, the embodiment of FIGs. 1 and 2 are easily extensible to multiple customers 101 and multiple clients 205. Also, DOT service 103 may comprise many different DOT services that each handle a subset of all DOTs. For example, findtheDOT 201 may promote the use of DOTs by issuing to individuals acting as clients the free and non-expiring use of a DOT on business cards. These DOTs may have a code embedded within that transfers requests corresponding to those DOTs to a second DOT service.

FIG. 7 is a flow chart of the first embodiment of the present invention showing the various steps in fulfilling a request for content; FIG. 7 serially presents some of the previous methods. In box 703, a customer 101 taps a DOT 109, acquiring DOT
code 127. In box 705, customer 101 sends request B including DOT code 127 and customer address 125 to DOT service 103. In addition to request B, not shown, is customer settings that control privacy and other features of the invention. In addition to sending request B, box 707 indicates that customer 101 stores DOT code 127 for confirmation. This is an optional step, in which data about the DOT 109 is stored in finder 117 or in electronic devices 113 for later confirmation from confirmation signal F. The stored data can be used to restrict or control the number of times a request is sent, or to allow the various electronics, such as electronic devices 113 or finder 117 to store data used for confirming that requested information has been sent.

In box 709, the DOT service 103 sends at least a portion of the DOT code and customer address 125 to the appropriate content service 107. In box 711, DOT service 103 sends confirmation, F, to customer 101. In box 713, DOT service 103 stores at least the DOT code for later use. DOT service, or another associated service retains some data for billing, quality control and client and customer relation purposes. In box 715, content service 107 generates content and sends D content to customer 101. In box 717, content service 107 stores DOT code and customer information for later use, if allowed.

**Alternative General Embodiments**

A second embodiment will now be presented that shows a fuller range of data being passed between customer 101, DOT service 103 and content services 107, all of which fall within the scope of the claimed invention. In particular the second embodiment illustrates some of the range of data that may be exchanged between the customer and the various services.

FIG. 8 is a block diagram of a second embodiment of the present invention illustrating the range of data that can be transferred and delivered between customer, DOT service and content service within the scope of the present invention. Request B’ includes the DOT data of FIG. 6D, such as DOT code 127, quality control data 611, finder ID 613, customer settings 619, acquisition time stamp 621, portal time stamp 623, and customer address 125. In addition, the second embodiment request B’ includes other data that is obtained from the finder, such as but not limited to: software and hardware versions, privacy override setting to control privacy levels,
allowing the public reception of requests, and battery power reserves. Request B' also includes specific customer information, such as: demographic information, privacy level, and the authorization of purchases. Forwarded request C' is seen to include information from the first embodiment, such as content index 609, acquisition time stamp 621, portal time stamp 623, customer address 125, and customer information 625. In addition, forwarded request C' can include any information supplied in B' that meets the requirements of the privacy level.

FIG. 9 is a block diagram showing the flow of data through the DOT service corresponding to the block diagram of FIG. 8. DOT service 103' receives request B', and the data contained there follows several paths. Path 9-1 prepares confirmation F' with communications program 907 by combining customer address 125 and DOT code 127. Path 9-2 determines the location to which forwarded request C' will be sent. Specifically, look-up table 901 is provided to determine the address of content service 107 corresponding to the content service index 607 portion of DOT code 127. The address of content service 107 is combined with the appropriate request B' data in communications program 909 for transmission to content service 107 as forwarded request C'. A DOT Database 903 and Quality Control Database 905 retain information for on the spot or post-processing. DOT Database 903 is similar in purpose to Request Database 203, while Quality Control Database 905 is used to determine the functioning of various components of the invention. Additional data from FIGs. 8 and 9 that can be used to benefit the operation of the present invention is a notification of customer 101 that finder 117 is low on batteries or needs updated software according to the battery power level or software revision portion of B', or determining from the quality control data that the finder is not operating properly and needs replacement, or that customer 101 is having problems making the finder operate properly and provide guidance on its proper use.

FIG. 10 is a block diagram showing the flow of data and information through the content service corresponding to the block diagram of FIG. 8. The primary activity of content service 107 according to the present invention is to determine, within a content generator 1001, an appropriate content for returning through communications program 1003 to customer 101. There is a range of appropriate content, a few of which will be outlined herein. A simple response to a request C' is
to provide the same content D’ to each customer 101. This requires little action on the part of content generator 1001 other than forwarding a set content D’ to a supplied address 125. Beyond this response, there is an ever increasing level of complexity of content generator 1001 using the information supplied from request C’. Thus content D’ could depend on the location of the request, the demographics of the customer, or the time of day. In addition, customer 101 may have allowed content service 107 to store information about the customer in content service/DOT database 1005, or the customer may have provided information to the content service directly or through third parties, which the content service can then use to formulate new responses based on past requests. Another method of determining responses to incorporate a random element in portions of the operation of dot service 103’ or any of content services 107”, providing customers with different responses at different times, such as to provide variety to customers or to provide a game of chance or random awards to certain customers.

**Specific Embodiments**

Specific uses and embodiments of the present invention will now be presented. These examples are meant to be illustrative of the many uses to which the methods and systems of the present invention can be put. It would be obvious to one skilled in the art to combine various features or actions of the previously discussed embodiments with any of those of the subsequent embodiment to produce other embodiments that are fully within the scope of the present invention.

A few of these alternative embodiments can be viewed through the type of information provided, and include but are not limited to text, such as an e-mail, web page or file for a word processing program; a link to a web page; or database information such as a contact, an appointment, or an image filter for use by programs such as a computer aided design program, a word processor, a dictionary, a thesaurus, a simulator, a game, a design program, or an editing program. Information that is capable of changing the operation of a computer or other electronic device includes but is not limited to: an executable program, configuration specification, preferences specification, and a script.
In addition the information may be related to the object on which the machine-readable code appears to facilitate commerce, such as supplying ordering, reordering or purchasing information, either by acknowledging that the request has generated a purchase or by supplying the customer with a print or electronic form to be returned to complete or in the chain of events leading to the completion of the transaction.

Other code embodiments are possible which would aid in the use and acceptance of the present invention. Thus the DOT code of FIG. 6A could be modified in appearance to more clearly show the associated use of the code by changing the generally circular appearance of the code to. Examples of modifications of the code appearance include but are not limited to: a dollar sign to indicate purchasing an object; a question mark to indicate obtaining information; and a book to indicate learning about an object. Other embodiments of present invention can also be used in a variety of other settings, such as: with mail for addressing and affixing postage; with packaged goods for determining contents, determining expiration dates, or inventory control, with software for validations coding, security coding, or encrypting files; in commerce for purchasing items; with electronic equipment for controlling an audio device; and in various data gathering operations for specifying test answers, voting, polling, census taking, inventory taking, or surveying a market.

The following are but a few of the many specific embodiments that are within the scope of the methods and systems of the present invention.

**Business Cards**

In this embodiment, DOTs are assigned for use on business cards. Acquisition of the DOT requests information specific to the card, such as contact information or further business information to be sent. The content can include a program works with software on the customer’s computer and installs contact information into the customer’s contact database.

**Reader Response**

In this embodiment, portable finders are used to acquire DOTs, and thus request information similar to a reader-response card system. Content service pay for the use of DOTs, as described previously, and agree to limit the number of responses and use of the information. There will usually be one content per request, though
multiple contents are possible if the associated markings clearly indicate that one request will produce multiple contents being delivered. Customers can acquire DOTs and generate requests using electronic devices as described in the first and second embodiments. Either DOT services or content services may respond within a short period of time after the forwarded request is received, or may produce an aggregated response to many requests at the same time. In another embodiment, a portion of DOT code specifies that the request is to produce an aggregated response, and the responses are aggregated accordingly.

The customers can check for requested information at their leisure. Acceptance of the methods will be facilitated with lightweight, portable and easy to use finders, and with an information that is retrievable using familiar methods, such as e-mail. In addition the privacy advantages of the invention, in particular as described as the second embodiment, are very important as they will aid in the acceptance and use of these methods. In a first alternative embodiment, customer 101 specifies that no information is to be retained by content service 107'. By agreement with issuing authority 105, content service 107' retains no customer information. In a second alternative embodiment, finder 117 has a privacy setting that customer 101 can activate to prevent otherwise allowable customer information from being retained. In a third alternative embodiment, finder 117 has a privacy setting that allows a credit card number to be passed along to content service 107'. The credit card number and privacy setting can be interpreted either in DOT service 103 or in electronic devices 113.

Another embodiment uses a hosting portal, configured as a web site, for accumulating requested information. The customer can then reach the hosting portal from any Internet connection to view, edit and respond to the requested information. This embodiment has the advantages that it is very private, since the actual whereabouts of the customer are unknown, it is convenient since it can be accessed from any Internet connection, and the customer does not have to maintain the content on his own machine. An additional advantage for the hosting portal service is that targeted information can be provided to the customer based on the content provided.
Catalog

In this embodiment, DOTs located on objects for sale, and the acquisition of DOTs is used to assemble a catalog of items that the customer or a sale associate can use as an aid in shopping. In one example of this embodiment, a customer 101 acquires multiple DOTs, and the multiple filled requests are collected on a web site in the form of a catalog. The web site is accessible to the sales associate, who along with the customer, can view the catalog. Multiple viewing of the catalog allows for more efficient shopping, as both the sale associate and customer have access to availability and accessorizing information that provides for more efficient shopping.

Reordering and Cataloging or Indexing Photographs

In this embodiment, contact service 107 is associated with a developer of photographs. When customer's photographs are developed, DOTs are placed on the edge or back of photographs, or alongside individual photographs on a contact sheet, and a database of digitized photographs is maintained for a period of time, such as a year. To place an order to obtain photographic reprints, customer 101 acquired DOT 109 associated with the particular photograph. Content service 107 responds with content D having an e-mail, web-based or instant-messaging based reordering information. A thumbnail version of the photograph may be included so that customer 101 can be sure of what is being ordered. The customer may submit the order form with payment information, or may have an account arranged so that payment is made on submission of the order form.

Global Positioning System

Another specific example of the present invention is the use of codes to provide directions in conjunction with a global positioning system (GPS). Customer 101 is supplied with codes that are associated with physical addresses. DOTs 109 can be presented on a map or other printed media, and can be organized by any of various methods, including but not limited to a map, list, or directory. The GPS can have built in (wired) finder, or can communicate with a wireless finder. Acquisition of the code by the finder instructs the GPS to provide the appropriate instructions. For this application, the GPS can form a stand-alone system that accepts code input, and network connections to computers other than the GPS may not be necessary.
Infrared-based Cellular Phone Communication

In some areas of the world, cellular telephones having infrared communications capabilities are common, while few people have Internet connections at their disposal. The methods and apparatus of the present invention provide a useful way of providing information in these circumstances. A finder 117 is equipped with infrared communications capabilities (such as communication A and G in FIG. 1A) for communications with a cellular telephone acting as electronic device 113. Communications B, E and F then proceed as cellular telephone communications.

Other Specific Embodiments

The present invention has many other applications for identification of object or persons, particularly for use in compiling inventories or catalogs and in conducting a census or poll. In one specific embodiment, the reading of a code is paid for by an indexer who wishes to compile a database. The acquired code results in a message being sent to the indexer, which is used to update an indexer database of item count, type, time of acquisition, etc.

Additional embodiments include the use of codes to automate documentation. For this embodiment, acquisition of the code results in the action described in the documentation to take place on a computer, PDA, cellular phone, or other network connected electronic appliances. In one specific embodiment, reading of the code causes a document on an electronic device to be sent as a fax after entering a phone number. In another specific embodiment, reading of the code causes all phone and name records from a phone to be sent to a computer for storage in a database. In another embodiment, the code causes a macro to be sent to the customer which the customer then uses with a word processing program to format documents.

In addition to the several embodiments described herein, the methods and apparatus of the present invention can be used in a variety of other embodiments. These include, but are not limited to use in games, either by having finders communicate through networks or among themselves, and as stand-alone informational devices, including but not limited to a book/CD-ROM combination in which the finder is used to illicit additional audio or visual information pertaining to the contents of the book.
Conclusion

The invention has now been explained with regard to specific embodiments. Variations on these embodiments and other embodiments may be apparent to those of skill in the art, either after considering the specification, claims and figures herein, or through application of the methods and systems of the present invention. It is therefore intended that the invention not be limited by the discussion of specific embodiments. It is understood that the examples and embodiments described herein are for illustrative purposes only and that various modifications or changes in light thereof will be suggested to persons skilled in the art and are to be included within the spirit and purview of this application and scope of the appended claims.
WHAT IS CLAIMED:

1. A method of electronically providing content requested by a customer in response to said customer electronically sending a binary code embedded in a particular optical glyph, wherein:

   said binary code is sent over the Internet to a DOT service that determines a service for providing said requested content;
   said DOT service provides said binary code to said determined content service;
   said determined content service provides content in accordance with the DOT code to said customer by a message service for later retrieval by said customer.

2. The method of claim 1, wherein:

   said particular optical glyph is assigned the binary code by a business entity for use by a content provider;
   said binary code is used to identify specific content that is sent to said customer;
   said business entity is paid by an originator of the content in at least one of the following ways:
   a) payment for unlimited use that is either restricted or unrestricted as to time,
      or
   b) payment based on the number of customer requests for content; and
   said business entity provides a DOT service for receiving requests and redirecting said requests to said content provider.

3. The method of claim 1, wherein said binary code is obtained by a finder that is tapped over said optical glyph.

4. The method of claim 1, wherein said message service is any one of e-mail, instant-messaging, a web site, or any combination thereof.

5. A method of electronically providing content requested by a customer in response to said customer electronically sending a binary code embedded in a particular optical glyph, wherein:

   said particular optical glyph is assigned the binary code by a business entity for use by a content provider;
said binary code is used to identify specific content that is sent to said customer by
a message service;
said business entity is paid by an originator of the content in at least one of the
following ways:
   a) payment for unlimited use that is either restricted or unrestricted as to time,
or
   b) payment based on the number of customer requests for content; and
said business entity provides a DOT service for receiving requests and redirecting
said requests to said content provider.

6. The method of claim 5, wherein said binary code is obtained by a finder that is
tapped over said optical glyph.

7. The method of claim 5, wherein said message service is any one of e-mail,
instant-messaging, a web site, or any combination thereof.

8. A method of electronically providing, by a message service, content requested
by a customer in response to said customer electronically sending a binary code
embedded in a particular optical glyph, wherein said binary code is obtained by a
finder that is tapped over said optical glyph.

9. The method of claim 8, wherein said message service is any one of e-mail,
instant-messaging, a web site, or any combination thereof.

10. A method of electronically providing content requested by a customer in
response to said customer electronically sending a binary code embedded in a
particular optical glyph, wherein said message system is any one of e-mail, instant-
messaging, a web page, or any combination thereof.

11. A method for fulfilling customer requests for content comprising:
   generating one or more requests with a finder, where each of said one or more
   requests are associated with a content service for fulfilling said request, and
   where each of said one or more requests is individually encoded in a machine-
   readable code readable with a finder;
submitting each of said one or more requests and customer information associated with an address to a DOT service; and

for each of said one or more requests,
forwarding, to said associated content, server information representative of said request and said address to be used only for fulfilling said request, and receiving, from said content service and by a message service, said requested content at said address.

12. The method of claim 11, wherein said submitting includes communicating over the Internet.

13. The method of claim 11, wherein said message service is any one of e-mail, instant-messaging, a web site, or any combination thereof.

14. A method of supplying requested information to customers comprising:
under the authority of an issuing agency,

authorizing, for each of at least one content provider, the distribution of one or more machine-readable codes, where each of said distributed machine-readable codes is associated with one of said at least one authorized content providers, where each of said distributed machine-readable codes is associated with a request for information, and where information for each of said at least one content provider is obtainable from an associated content service;

assigning value on the use of said one or more distributed machine-readable codes collectable from said associated content provider;
on a DOT service operating under the authority of said issuing agency,
receiving one or more requests from a customer having an address, where each of said one or more requests is associated with the receiving of at least a portion of said one or more distributed machine-readable codes; and
supplying, to each of said content service associated with said received requests, said request and said address to be used for the purpose of responding, by a message service, to said request.
15. The method of claim 14, wherein said assigning value is according to at least one of the following ways:
   
a) payment for unlimited use that is either restricted or unrestricted as to time, or
   
b) payment based on the number of customer requests for content.

16. The method of claim 14, said binary code is obtained by a finder that is tapped over said optical glyph.

17. The method of claim 14, wherein said message service is any one of e-mail, instant-messaging, a web site, or any combination thereof.

18. The method of claim 14, wherein said content service accumulates customer information under the authority of said issuing agency.

19. The method of claim 14, wherein responding consists of a number of responses under the control of said issuing agency.

20. The method of claim 19, wherein said number of responses is one response.

21. The method of claim 19, wherein said number of responses is multiple responses, where said multiple responses are related to said request.

22. The method of claim 14, wherein said assigning value assigns value for the unlimited use of said machine-readable code by said authorized content provider for at least one of the following ways: for a limited time; or for an unlimited time.

23. The method of claim 14, further comprising, under the authority of an issuing agency, tracking the number of requests for at least one of said one or more machine-readable codes with said authorized content provider, and wherein said assigning value assigns value based on said number of requests.

24. The method of claim 14, wherein said receiving requests includes acquiring said machine-readable code with a finder and communicating said acquired machine readable code to said DOT service.

25. The method of claim 24, wherein said acquiring includes a tapping motion between said finder and said machine-readable code.
26. The method of claim 24, wherein said communicating includes communicating through wireless communication from said finder to a base unit and communicating through a computer network from said base unit to said DOT service.

27. The method of claim 25, wherein said computer network includes the Internet.

28. The method of claim 14, wherein said supplying said request includes supplying customer approved information.

29. The method of claim 14, wherein said supplying said request includes supplying receiving information.

30. A method of regulating the use of a plurality of machine-readable codes to be read by one or more customers, where each of said plurality of machine-readable codes read generates one request for information from one or more content providers, said method comprising:

   overseeing the use of said plurality of machine-readable codes, where said use includes converting said machine-readable codes into said corresponding requests with a finder under the control of a customer, and where said overseeing includes,

   authorizing each of said one or more content providers to use individual ones of said one or more machine-readable codes, where each of said one or more machine-readable codes is associated with information from one of said one or more content providers, and where each of said one or more content provider arranges to provide said information from an associated content service;

   providing for a DOT service to receive said one or more requests and forward at least a portion of said one or more requests and customer information to said associated content service, where said customer information includes a customer address for fulfilling said request, and determining a value to be collected from said one or more content providers for the use of said associated machine-readable codes.

31. The method of claim 30, wherein said determining said value determines said value for the unlimited use of said machine-readable code by said associated content
provider for at least one of the following ways: for a limited time; or for an unlimited
time.

32. The method of claim 30, said overseeing further comprising tracking the
number of requests for at least one of said one or more machine-readable codes with
said associated content provider, and wherein said determining said value determines
said value based on said number of requests.

33. The method of claim 30, wherein said use further includes:

  generating said request corresponding to said at least a portion of said machine-
  readable code in said finder;

  storing said request in a computer memory, and

  communicating said request to said DOT service.

34. The method of claim 33, wherein said communicating said request includes:

  a first communicating said request from said finder to a base unit, where said first
  communicating includes a wireless communication,

  a second communicating said request from said base unit to a portal device, and

  a third communicating said request from said portal device to said corresponding
  DOT service, where said third communicating includes Internet communication.

35. A method of providing one response for content per request to a customer
comprising:

  receiving one or more requests from a finder into a DOT service corresponding to
  each of said one or more requests, where said finder generates requests from
  least a portion of a machine-readable code on a surface, where said finder has a
  computer memory for storing information related to said requests and
  electronics to communicate with each of said corresponding DOT services, and

  acquiring said request by tapping said finder and said machine-readable code,
  and

  communicating said request to said corresponding DOT service;

for at least one of said one or more requests,

  associating a content service to said request;
supplying said request to said associated content service;
determining said content corresponding to said request; and
providing said content to said customer by a message service,
such that a customer can request one or more responses by acquiring one or more readable codes with said finder, and such that said one or more readable codes are communicated, through said corresponding DOT service, to said associated content service for supplying said content to said customer.

36. The method of claim 35, wherein said associating said content service associates said content service under the control of said corresponding DOT service.

37. The method of claim 35, wherein said determining said content determines said content under the control of said corresponding DOT service, said content service, or any combination thereof.

38. The method of claim 35, wherein said corresponding DOT service is separate from said content service.

39. The method of claim 35, wherein said finder is adapted to read UPC codes.

40. The method of claim 35, wherein at least one of said machine-readable codes is associated with any one of an advertisement, an article, an events listing, a catalog listing, a sales device, a marketing device, a promotional device, a business card, a directory listing, a dictionary, a thesaurus, an almanac, an encyclopedia, a reference book, a coupon, a bill, an envelope, a map, or any combination thereof.

41. The method of claim 35, wherein at least one of said one or more requests are associated with any one of addressing, affixing postage, validations coding, security coding, encrypting files, directing customers to locations, determining contents, determining expiration dates, inventory control, hyperlinking information in books, purchasing items, travel guide information, controlling an audio device, specifying test answers, voting, polling, surveying a market, or any combination thereof.

42. The method of claim 35, wherein said corresponding DOT service is a first network comprising one or more computers, wherein said content service is a second
network comprising one or more computers, and wherein said first network and said second network have at least one computer in common.

43. The method of claim 35, wherein said corresponding DOT service is a first network comprising one or more computers, wherein said content service is a second network comprising one or more computers, and wherein said first network and said second network have no common computers.

44. The method of claim 35, wherein said request is a request for any one of a location, a weather report, historical information, travel information, telephone information, or any combination thereof.

45. The method of claim 44, wherein said message service is instant-messaging.

46. The method of claim 35, wherein said message service is any one of e-mail, instant-messaging, a web site, or any combination thereof.

47. The method of claim 35, wherein said message service includes a first message service and a second message service, where said first message service is instant-messaging, where said second message service is any one of e-mail, a web site, or any combination thereof, and where said second message service follows said first message service if said first message service fails to provide said content.

48. The method of claim 35, wherein said finder stores a finder identification, and further comprising associating said finder identification with said customer.

49. The method of claim 35, said finder having a customer preference setting corresponding to a customer preference, and further comprising receiving said customer preference setting, wherein said receiving one or more requests receives at least one multiple identical request, and said customer preference setting indicates a customer preference for controlling communication of said at least one multiple identical request.

50. The method of claim 35, wherein said receiving each of said one or more requests from said finder further includes:
   comparing said code with previously stored codes in memory; and
   generating no request if said acquired code was previously stored,
such that no request is received for multiple requests for the same content.

51. The method of claim 35, wherein said associating said content service associates said content service according to an apparently random association process.

52. The method of claim 35, wherein said determining said content determines said content according to an apparently random determination process.

53. The method of claim 35, wherein each of said one or more readable codes includes a first code part having DOT service information and a second code part having index information, said receiving further comprising corresponding, within said finder, said DOT service information to said corresponding DOT service, such that said index information comprises said request and said DOT service information determines which corresponding DOT service receives said request.

54. The method of claim 35, wherein said receiving each of said one or more requests from said finder further includes:

   generating said request corresponding to said at least a portion of said machine-readable code in said finder; and

   storing said request in said computer memory,

   wherein said communicating said request communicates from said computer memory.

55. The method of claim 54, wherein generating said request generates a binary code from at least a part of said readable code.

56. The method of claim 55, wherein said binary code is a number having 64 binary digits.

57. The method of claim 54, wherein said receiving each of said one or more requests from said finder further includes generating finder attribute bits using the part of said code not used to generate said request, where said finder attribute bits are one or more bits, and where said finder attribute bits determine attributes of generating said request.

58. The method of claim 54, wherein said communicating said request includes:
a first communicating said request from said finder to a base unit, where said first communicating includes a wireless communication;
a second communicating said request from said base unit to a portal device having a portal device memory for storing requests been previously communicated to said portal device, where said second communicating includes Internet communication;
determining if said request has been previously communicated to said portal device; and
if said request has been previously communicated to said portal device, do not communicate said request to said corresponding DOT service,
such that multiple requests for the same content are not provided to said customer.

59. The method of claim 54, wherein said communicating said request includes:
a first communicating said request from said finder to a base unit, where said first communicating includes a wireless communication,
a second communicating said request from said base unit to a portal device, and
a third communicating said request from said portal device to said corresponding DOT service, where said third communicating includes Internet communication.

60. The method of claim 59, wherein said message service is any one of e-mail, instant-messaging, a web site, or any combination thereof.

61. The method of claim 59, wherein said message service includes a first message service and a second message service, where said first message service is instant-messaging, where said second message service is any one of e-mail, a web site, or any combination thereof, and where said second message service follows said first message service if said first message service fails to provide said content.

62. The method of claim 59, wherein said wireless communication is radio frequency communication.

63. The method of claim 59, wherein said corresponding DOT service is a first network comprising one or more computers, wherein said content service is a second network comprising one or more computers, and wherein said first network and said second network have no common computers.
64. The method of claim 59, wherein said corresponding DOT service is a first network comprising one or more computers, wherein said content service is a second network comprising one or more computers, and wherein said first network and said second network have at least one computer in common.

65. The method of claim 59, wherein said portal device is a web-connectable device selected from the group consisting of a personal computer, a laptop computer, an Internet appliance, a global positioning system, a personal digital assistant, a telephone, a pager, a set-top box, a network hub, a modem and a networked device on an Internet-connected network.

66. The method of claim 59, further comprising, for at least one of said one or more requests, displaying said content on a display device, where said display device is capable of communicating over the Internet, and where said display device is incorporated into said portal device.

67. The method of claim 59, wherein said base unit is internal to said portal device.

68. The method of claim 59, wherein said base unit is external to said portal device.

69. The method of claim 59, further comprising notifying the customer of said finder, wherein said notifying includes a fourth communicating from said base unit to said finder of a notification signal, where said notification signal indicates the status of the communication of said one or more request, and generating a notification within said finder.

70. The method of claim 69, wherein said communicating is a wireless communicating.

71. The method of claim 69, wherein said finder includes a noise generator, and wherein said generating said notification generates an audible signal.

72. The method of claim 69, wherein said finder includes a visual indicator, and wherein said generation said notification generates a visual signal.
73. The method of claim 69, wherein said status is a status of said first communication.

74. The method of claim 59, further comprising receiving communication information.

75. The method of claim 74, wherein said received communication information is any one of receiving a date, receiving a time, or any combination thereof.

76. The method of claim 75, wherein said received communication information corresponds to said receiving of said one or more readable codes.

77. The method of claim 75, wherein said received communication information corresponds to acquiring said readable code, generating said request, communicating said request including said first communicating, said second communicating, or said third communicating, or any combination thereof.

78. The method of claim 75, wherein said associating said content service associates said content service according to said received communication information.

79. The method of claim 75, wherein said determining said content determines said content according to said received communication information.

80. The method of claim 59, further comprising:

   a forth communicating of a request receipt to said finder, where said request receipt indicates the successful reception of said request;

   determining said code corresponding to said acknowledged request; and

   deleting said determined code from said finder memory.

81. The method of claim 80, wherein said forth communicating is from said corresponding DOT service.

82. The method of claim 80, wherein said forth communicating is from said associated content service.

83. The method of claim 35, further comprising, for at least one of said one or more requests, displaying said content on a display device.
84. The method of claim 83, wherein said displaying said content modifies said display according to said content.

85. The method of claim 84, wherein said modifying said display device modifies the appearance of content on of said display device.

86. The method of claim 84, wherein said display device comprises at least one computer program, and wherein said modifying said display device modifies the operation of at least one of said at least one computer program.

87. The method of claim 86, wherein said content is any one of an executable program, a configuration specification, a preferences specification, a script, a macro, or any combination thereof.

88. The method of claim 84, wherein said content is structured data, and said modifying modifies by adding said structured data to an existing structured database accessible to said display device.

89. The method of claim 88, wherein said existing structured database is any one of a contact database, an appointment database, an image filter database, or any combination thereof.

90. The method of claim 88, wherein said existing structured database is a library database, wherein said added structured data are elements for use by a computer program, and wherein said added structured data is any one of a computer aided design program, a word processor, a dictionary, a thesaurus, a simulator, a game, a design program, an editing program, or any combination thereof.

91. The method of claim 83, wherein said display device is a web-connectable devices, and where said web-connectable device is any one of a personal computer, a laptop computer, an Internet appliance, a global positioning system, a personal digital assistant, a telephone, a pager, a set-top box, a television, a videocassette recorder, a television server, a pair of goggles, a pair of glasses, a helmet, or any combination thereof.

92. The method of claim 83, wherein said message service is any one of e-mail, instant-messaging, a web site, or any combination thereof, and wherein said
displaying said content displays said content using a program compatible with said message service.

93. The method of claim 83, wherein said display device is said portal device.

94. The method of claim 83, said finder having a request preference setting corresponding to a request preference, and further comprising receiving said request preference setting, wherein said customer preference indicates preferences associated with said displaying said content, where said preferences associated with said displaying said content are any one of a request priority, a display format, displaying said content on an alternative display device, or any combination thereof.

95. The method of claim 35, further comprising receiving customer information in said corresponding DOT service, and supplying at least a portion of said received customer information to said associated content service.

96. The method of claim 95, further comprising retaining a record correlating at least some portion of said received codes with some corresponding customer information, wherein said record is retained in one of said corresponding DOT services.

97. The method of claim 95, further comprising retaining a record correlating at least some portion of said provided content with some corresponding customer information, wherein said record is retained in said associated content service.

98. The method of claim 95, said finder having a customer preference setting corresponding to a customer preference, and further comprising receiving said customer preference setting, and wherein said supplying at least a portion of said received customer information is controlled by said customer preference.

99. The method of claim 95, wherein said received customer information is any of name, age, gender, address, electronic address, finder identification, or any combination thereof.

100. The method of claim 95, wherein said associating said content service associates said content service according to said at least some of said received customer information.
101. The method of claim 95, further comprising storing said received customer information in said corresponding DOT service, and supplying from said stored customer information at least a portion of said received customer information to said content service.

102. The method of claim 95, wherein said determining said content determines said content according to said at least some of said received customer information.

103. The method of claim 95, wherein said providing said content provides said content according to said at least some of said received customer information.

104. The method of claim 35, further comprising issuing codes, where said issued codes are used for generating said readable code associated with said content, and wherein said issuing and said associating said content service are performed by a common organization.

105. The method of claim 104, further comprising charging for issuing codes.

106. The method of claim 105, wherein said charging for issuing codes is and one of charging per code issued, charging per receiving of each code, charging through a licensing agreement, or any combination thereof.

107. The method of claim 35, further comprising:
    acquiring with said finder a quality control information of said one or more readable codes; and
    communicating said quality control information to said DOT service.

108. The method of claim 107, further comprising analyzing said quality control information to determine quality aspects of said received code.

109. The method of claim 108, wherein said quality aspects of said received code are any one of paper quality, paper whiteness, ink uniformity, ink color, ink bleed, image orientation, illumination uniformity within said finder, temporal illumination variations, alignment between said code and said finder, image size, image aspect ratio, image focus, optical quality, source of reading errors, alignment of said finder by said customer, or any combination of thereof.
110. The method of claim 107, said receiving further comprising storing within said finder at least a portion of said quality control information.

111. The method of claim 107, said receiving further comprising selecting random quality control information portions for storing within said finder.

112. The method of claim 84, wherein said modifying said display device modifies the programming of said display device.

113. The method of claim 112, wherein said content an executable program.

114. The method of claim 83, wherein said display device is connected to a local area network having at least one additional electronic device.

115. The method of claim 114, further comprising providing a command for execution by said at least one additional electronic device.

116. The method of claim 115, wherein said providing a command for execution comprises modifying the operation of said at least one additional electronic device.

117. The method of claim 115, wherein said providing a command for execution comprises requesting information from said at least one additional electronic device.

118. The method of claim 115, wherein said electronic device is a videocassette recorder.

119. The method of claim 115, wherein said electronic device is a utility meter.

120. A one-tap method of requesting content comprising:
tapping a readable code with a finder capable of reading said code, where said readable code corresponds to a request, and where said finder is in wireless communications with an Internet connected device capable of fulfilling said request; and
receiving a request fulfilled through a message service.

121. The method of claim 120, wherein said request is a request to enter a check entry into a ledger, and said receiving said fulfilled request is the entering said check entry into said ledger.
122. The method of claim 120, wherein said request is a request to enter medical information into a database, and said receiving said fulfilled request is the entering said medical information into said medical information database.

123. The method of claim 120, wherein said request is a request for information selected from the group consisting of stock quotes, or horoscopes, and wherein said content is included within a message obtained from a message service selected from the group consisting of e-mail, instant-messaging, a web site, and any combination thereof.

124. The method of claim 120, wherein said request is a request to order a service, and said receiving said fulfilled request is the receiving of said service.

125. The method of claim 120, wherein said request is a request send a fax, and said receiving said fulfilled request is the sending of said fax.

126. The method of claim 120, wherein said request is a request to configure software on a computer, and said receiving said fulfilled request is said configuring of said software on said computer.

127. The method of claim 120, wherein said request is a request for a videocassette recorder to record a television program, said receiving said fulfilled request is said recording of said program.

128. The method of claim 120, wherein said request is a request to translate a word from a first language into a second language, and said receiving said fulfilled request is said translation of said word from said first language into said second language.

129. The method of claim 120, wherein said request is a request to order a product, and said receiving said fulfilled request is the receiving of said product.

130. The method of claim 120, wherein said request is a request for information selected from the group consisting of directions to a location, weather reports, historical information, travel information, or telephoning information.

131. The method of claim 130, wherein said message service is any one of e-mail, instant-messaging, a web site and any combination thereof, and wherein said request
is fulfilled by said message service by any of the methods of receiving verbal content or receiving content.

132. The method of claim 130, wherein said code is contained on a map, and said request is associated with the position of said code on said map.

133. The method of claim 120, wherein said request is a request to order a product, and said receiving said fulfilled request is the receiving of said product.

134. The method of claim 133, wherein said product is any one of food, clothing, books, software, or any combination thereof.

135. The method of claim 120, wherein said request is a request to enter contact information into a database, and said receiving said fulfilled request is the entering said contact information into said contact database.

136. The method of claim 135, wherein said code is on a object selected from the group consisting of a business card, an advertisement, or a directory.

137. A method of providing content to a customer comprising:

- receiving one or more requests from a finder each into a corresponding DOT service, where each of said one or more requests is a request for content, where each of said one or more requests corresponds to at least a portion of a code, and where said code is readable by said finder;

- for at least one of said one or more requests,

- associating a content service for to said request,

- supplying said request to said associated content service;

- determining said content corresponding to said requests,

- determining if said request was previously requested and if said previously requested content differs from said determined content, and

- if said determined content has not changed, do not providing said determined content to said customer,

such that said customer only receives updates to content corresponding to said request.
138. A method of providing directions according to information from a code comprising:

receiving a request from a finder into a DOT service, where said request is associated with a physical location, where said request is contained in at least a portion of a machine-readable code, where said finder has electronics to communicate with said DOT service, and where receiving each of said one or more requests includes:

acquiring said request by tapping said finder and said machine-readable code, and

communicating said request to said DOT service;

associating a content service to said request;

supplying said request to said associated content service;

determining said content corresponding to said request, and

displaying said content to on a display device,

such that a customer can request positional-dependent information by acquiring a machine-readable code with said finder and said positional-dependent content is presented to said customer on said display device.

139. The method of claim 138, wherein said display device is located inside an automobile.

140. The method of claim 138, wherein said determining said content includes determining said contents from information contained on removable computer storage media.

141. The method of claim 138, wherein said portal device is said display device.

142. The method of claim 138, wherein said DOT service is said content service.

143. The method of claim 138, wherein said request is a request for an indication of a physical location, and wherein said content is an indication of a physical location.

144. The method of claim 138, wherein said display device provides navigational information to said customer.
145. The method of claim 143, further comprising receiving positional information from a global positioning system, and wherein said content includes navigational information indicative of a present location as obtained from said global positioning system and a requested location.

146. The method of claim 143, wherein said machine-readable code is presented as indicative of a physical location.

147. The method of claim 146, wherein said machine-readable code is on a map.

148. The method of claim 146, wherein said physical location is a street address.

149. A method for filling requests for content by a system of one or more computers to a customer, comprising:

receiving one or more requests from a finder into a corresponding DOT service,

where each of said one or more requests corresponds to a machine-readable code readable by said finder;

for each of said one or more requests:

establishing an electronic address corresponding to said request;

establishing a privacy level associated with said request,

determining said content service corresponding to said request, where said determining said content service determines in association with said DOT service,

transmitting said request and said electronic address from said corresponding DOT service to said corresponding content service,

generating content from said transmitted request, where said generating content generates in association said content service,

retaining customer information by said corresponding content service according to said privacy level, and

delivering said content to said corresponding electronic address from said corresponding content service, such that one requested content is supplied for each received code and said retention of information by said system is controlled by the source of said received privacy level.
150. The method of claim 149, wherein said machine-readable code is readable by tapping said machine-readable code.

151. The method of claim 149, wherein said receiving one or more requests includes wireless communication from said finder.

152. The method of claim 149, wherein said machine-readable code is an optical matrix code.

153. The method of claim 149, wherein said DOT service is a network of computers associated with said DOT service.

154. The method of claim 149, wherein said content service is a network of computers associated with said content service.

155. The method of claim 149, wherein said transmitting said request includes transmission over the Internet.

156. The method of claim 149, wherein said code is a machine-readable numeric code.

157. The method of claim 149, further receiving additional information from the finder into said DOT service, where said establishing a return address is determined by said corresponding DOT service in association with said additional information.

158. The method of claim 149, where said establishing a return address is determined by said corresponding DOT service.

159. The method of claim 149, wherein customer information is obtained from sources selected from the group consisting of said customer, said receiving of one or more requests, said corresponding DOT service, or any combination thereof.

160. The method of claim 149, wherein customer information includes said return address.

161. The method of claim 149, further comprising transmitting said customer information to said corresponding content service, wherein customer information is
any of name, gender, address, phone number, income, identification numbers, zip code, statistically derived information, or any combination thereof.

162. The method of claim 149, wherein said privacy level allow the retention of all obtained customer information, and said retaining customer information retains any of said customer information.

163. The method of claim 149, wherein said privacy level does not allow the retention of any customer information, and said retaining customer information retains no customer information.

164. The method of claim 149, where said establishing said electronic address is determined by said corresponding dot service.

165. The method of claim 149, wherein customer information includes said electronic address.

166. The method of claim 149, wherein said code is a digital code determined by reading an optically coded surface.

167. The method of claim 166, wherein said code is a 64-bit number.

168. A method of filling orders for copies of documents, where said documents include machine-readable codes, comprising:

   receiving requests for documents, where said request includes reading said machine-readable codes corresponding to said documents;

   communicating said request to said provider; and

   providing said document corresponding to said machine-readable code.

169. The method of claim 168, wherein said documents are photographs.

170. The method of claim 168, further comprising verifying said request before providing said documents.

171. A system for electronically delivering a content request to a customer, said system comprising:

   an electronic finder adapted to input one or more content requests, where each of said one or more content requests is included in machine-readable code, and
where said electronic finder includes wireless communications for transmitting said one or more requests;
a portal device adapted to receive said wireless transmissions of said one or more requests from said electronic finder, determine DOT service locations corresponding to each of said one or more requests, and communicate said one or more requests over the Internet to said corresponding DOT service location;
a DOT service at each of said DOT service location, where each DOT service receives said corresponding requests over the Internet from said portal device, determines content services locations corresponding to said corresponding requests, and communicates said requests over the Internet to said corresponding content service locations; and
a content service at each of said content service locations, said content service adapted to receive said corresponding requests from said DOT service, generate content corresponding to each request and electronically deliver said request to said customer.

172. A system for supplying requested content over a network to a specified address, where said request includes information contained in a machine-readable code, where a finder generates a digital code from said machine-readable code, where said digital code has a first code portion and a second code portion, were said first code portion of said digital code corresponds to a requested content service address, and where said second portion of said digital code corresponds to a requested content identifier, said system comprising:
a DOT service connected to said network, where said DOT service is configured to process said request, where said DOT service determines both said requested content service address and said requested content identifier associated with said digital code, and where said DOT service generates a request to said requested content service address comprising said requested content identifier and said specified address; and
one or more content services, where one of said one or more content services has said requested content service address, and were said content service having said requested content service address is configured to receive said second
request, generate requested content according to said requested content identifier, and send said generated requested content to said specified address.

173. A system for delivering one or more requests for content over a network to a specified address, where said one or more requests include a content service address and a content identity, said system comprising:

a DOT service connected to said network, where said DOT service determines both said content service address and said content identifier associated with said digitally coded request, and where said DOT service generates a request to said content service address comprising said content identifier and said specified address.

174. A system for electronically delivering a content request to a customer, said system comprising:

an electronic finder adapted to input one or more content requests, where each of said one or more content requests is included in machine-readable code, and where said electronic finder includes wireless communications for transmitting said one or more requests;

a portal device adapted to receive said wireless transmissions of said one or more requests from said electronic finder, determine dot service locations corresponding to each of said one or more requests, and communicate said one or more requests over the Internet to said corresponding dot service location;

a dot service at each of said dot service location, where each dot service receives said corresponding requests over the Internet from said portal device, determines content services locations corresponding to said corresponding requests, and communicates said requests over the Internet to said corresponding content service locations; and

a content service at each of said content service locations, said content service adapted to receive said corresponding requests from said dot service, generate content corresponding to each request and electronically deliver said request via instant messaging to said customer.
FIG. 2B
If you want more information on our product, tap the dot and receive the information you need.