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Nash

(54) **SYSTEM TO GENERATE AN AGGREGATE INTEREST INDICATION WITH RESPECT TO AN INFORMATION ITEM**

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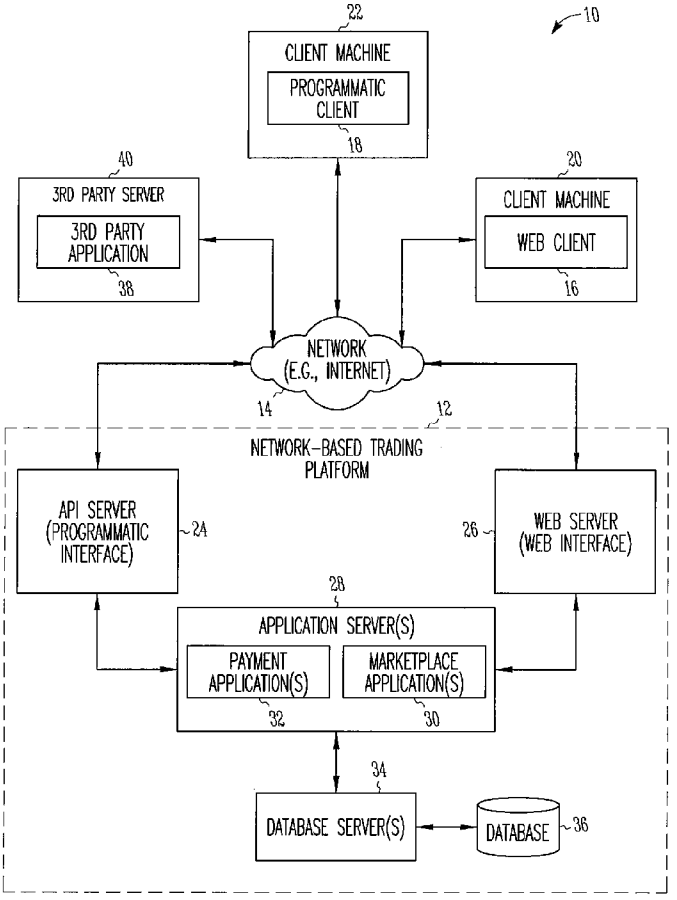
(57) **ABSTRACT**

A method is provided to publish a list of top ranked listings. The method may include configuring a database to store a plurality of listings published over a network. An interest indication may be received from a user for a listing in the plurality of listings. An interest indication data structure may be created and stored that associates the user with the listing. Also, the top ranked listings may be identified from the plurality of listings based on the number of stored interest indication data structures for each listing. Further, the list of the top ranked listings may be published.



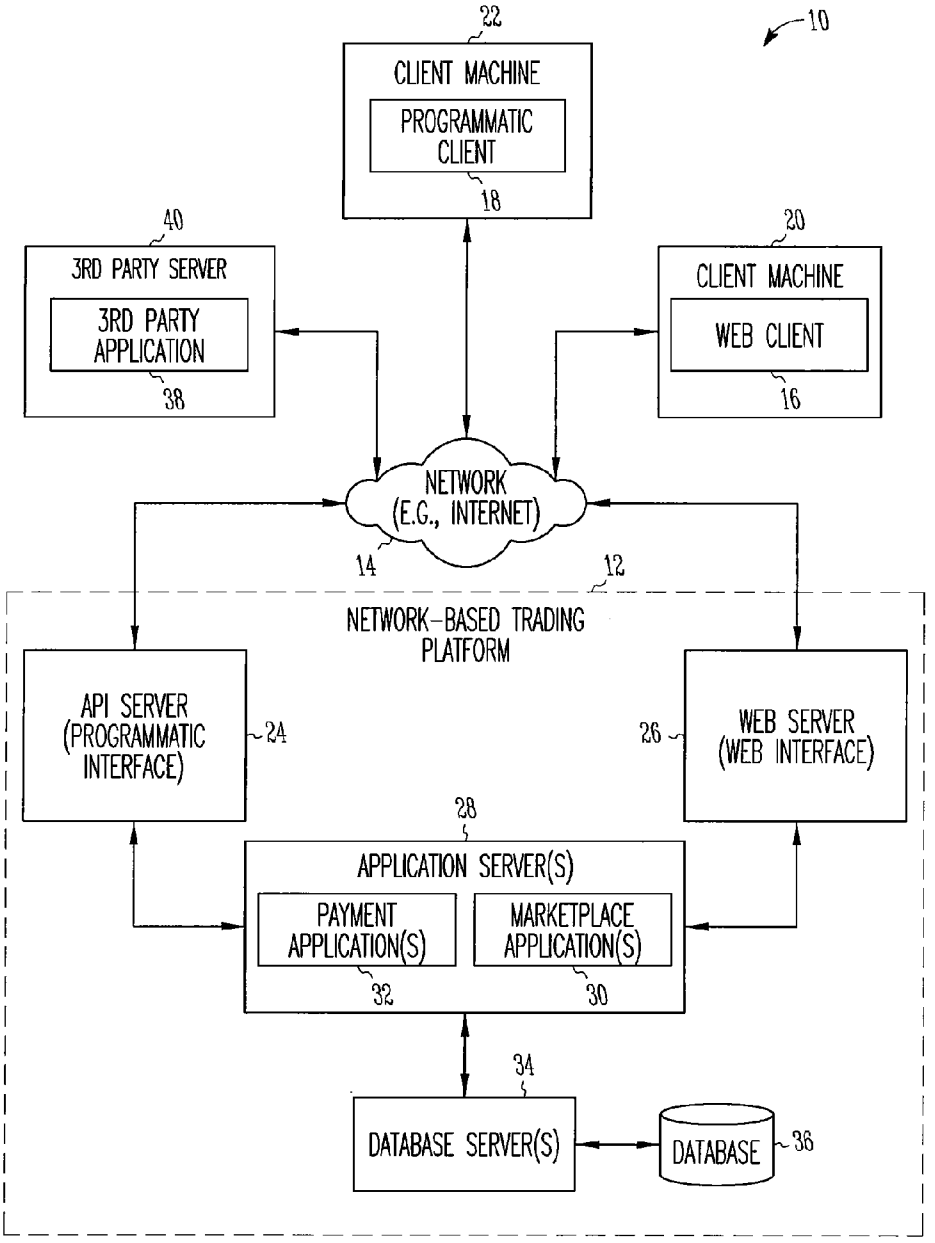

22
10
CLIENT MACHINE
PROGRAMMATIC CLIENT
18
40
3RD PARTY SERVER
3RD PARTY APPLICATION
38
20
CLIENT MACHINE
WEB CLIENT
16
NETWORK (E.G., INTERNET)
14
12
NETWORK-BASED TRADING PLATFORM
API SERVER (PROGRAMMATIC INTERFACE)
24
26
WEB SERVER (WEB INTERFACE)
28
APPLICATION SERVER(S)
PAYMENT APPLICATION(S)
32
MARKETPLACE APPLICATION(S)
30
34
DATABASE SERVER(S)
DATABASE
36

FIG. 1

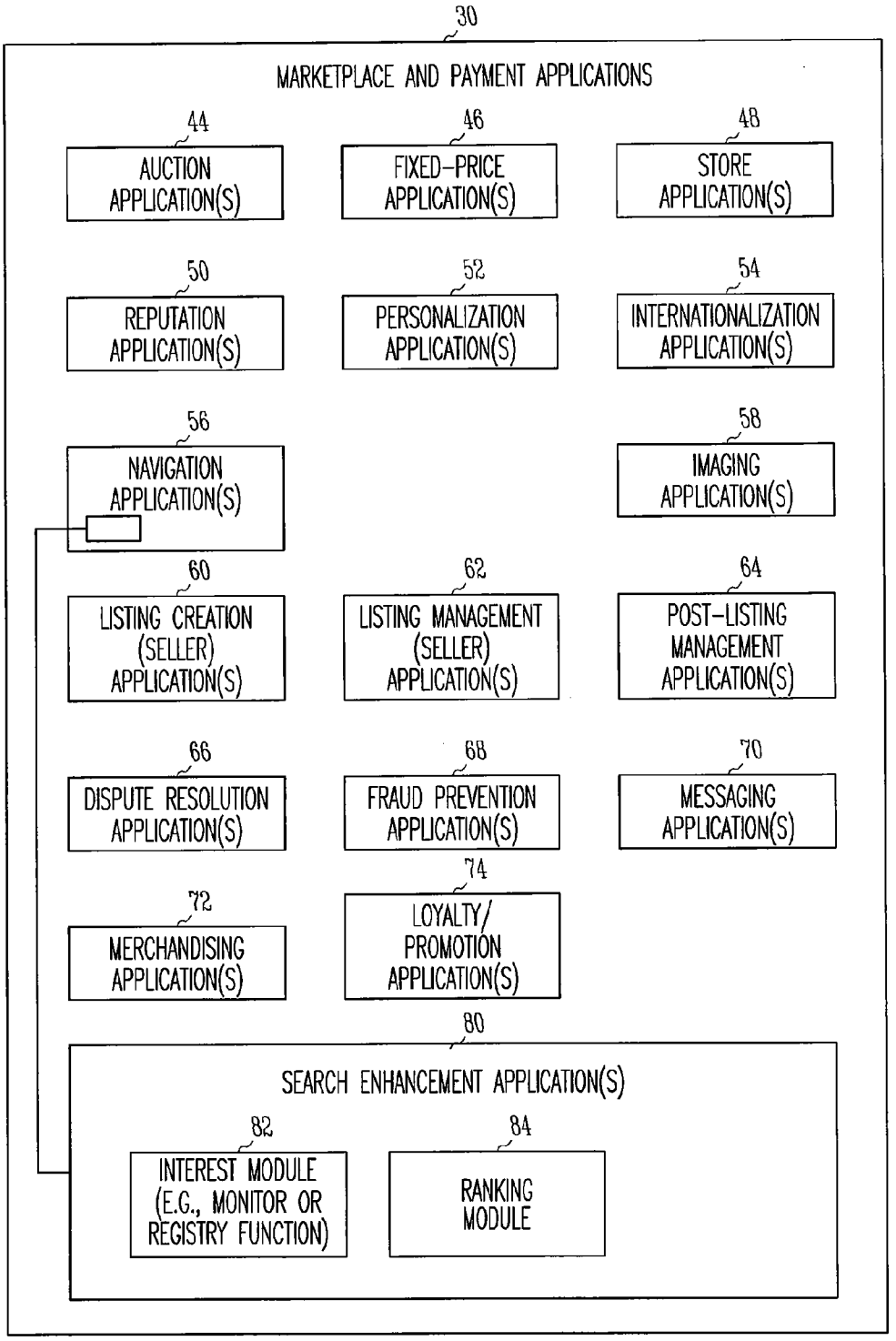

30
MARKETPLACE AND PAYMENT APPLICATIONS
44
AUCTION APPLICATION(S)
46
FIXED-PRICE APPLICATION(S)
48
STORE APPLICATION(S)
50
REPUTATION APPLICATION(S)
52
PERSONALIZATION APPLICATION(S)
54
INTERNATIONALIZATION APPLICATION(S)
56
NAVIGATION APPLICATION(S)
58
IMAGING APPLICATION(S)
60
LISTING CREATION (SELLER) APPLICATION(S)
62
LISTING MANAGEMENT (SELLER) APPLICATION(S)
64
POST-LISTING MANAGEMENT APPLICATION(S)
66
DISPUTE RESOLUTION APPLICATION(S)
68
FRAUD PREVENTION APPLICATION(S)
70
MESSAGING APPLICATION(S)
74
LOYALTY/ PROMOTION APPLICATION(S)
72
MERCHANDISING APPLICATION(S)
80
SEARCH ENHANCEMENT APPLICATION(S)
82
INTEREST MODULE (E.G., MONITOR OR REGISTRY FUNCTION)
84
RANKING MODULE

FIG. 2

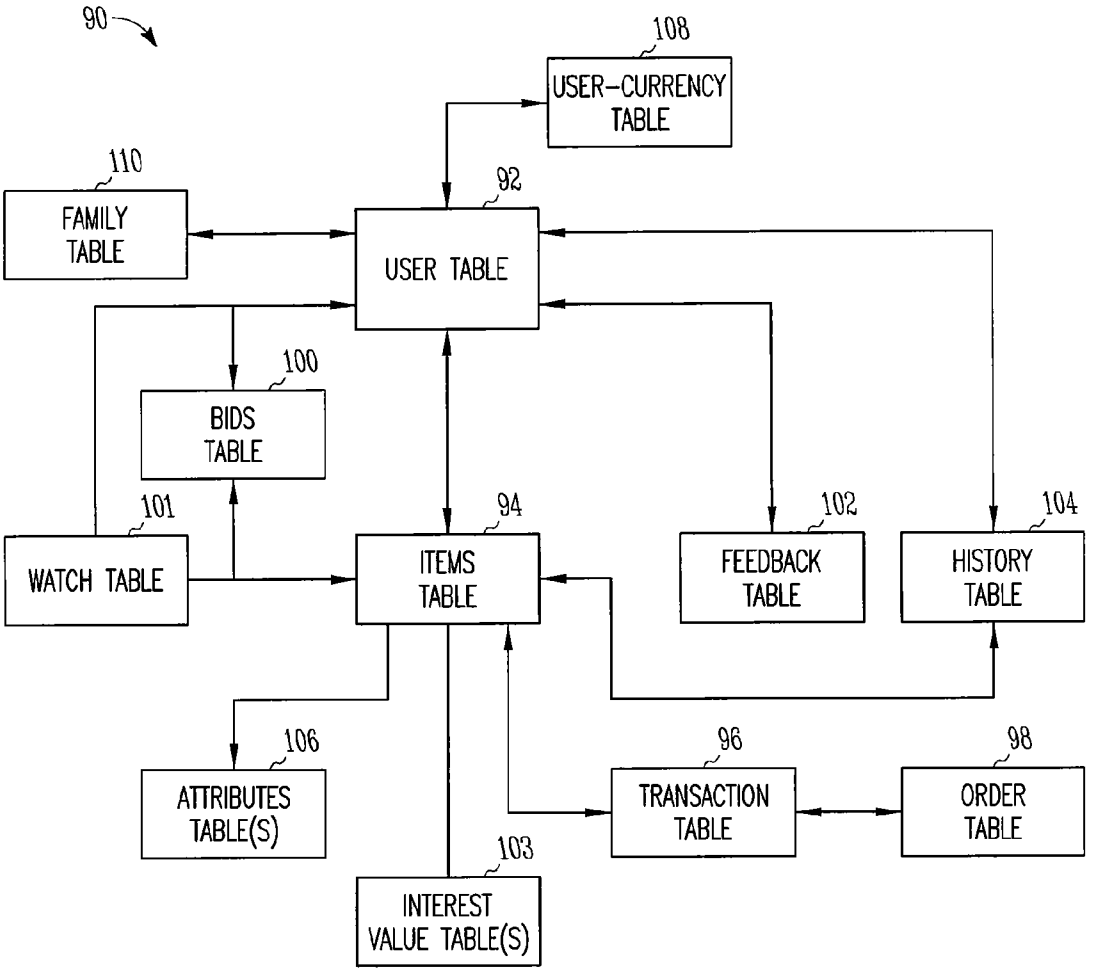

90
108
USER-CURRENCY TABLE
110
FAMILY TABLE
92
USER TABLE
100
BIDS TABLE
101
WATCH TABLE
94
ITEMS TABLE
102
FEEDBACK TABLE
104
HISTORY TABLE
106
ATTRIBUTES TABLE(S)
96
TRANSACTION TABLE
98
ORDER TABLE
103
INTEREST VALUE TABLE(S)

FIG. 3

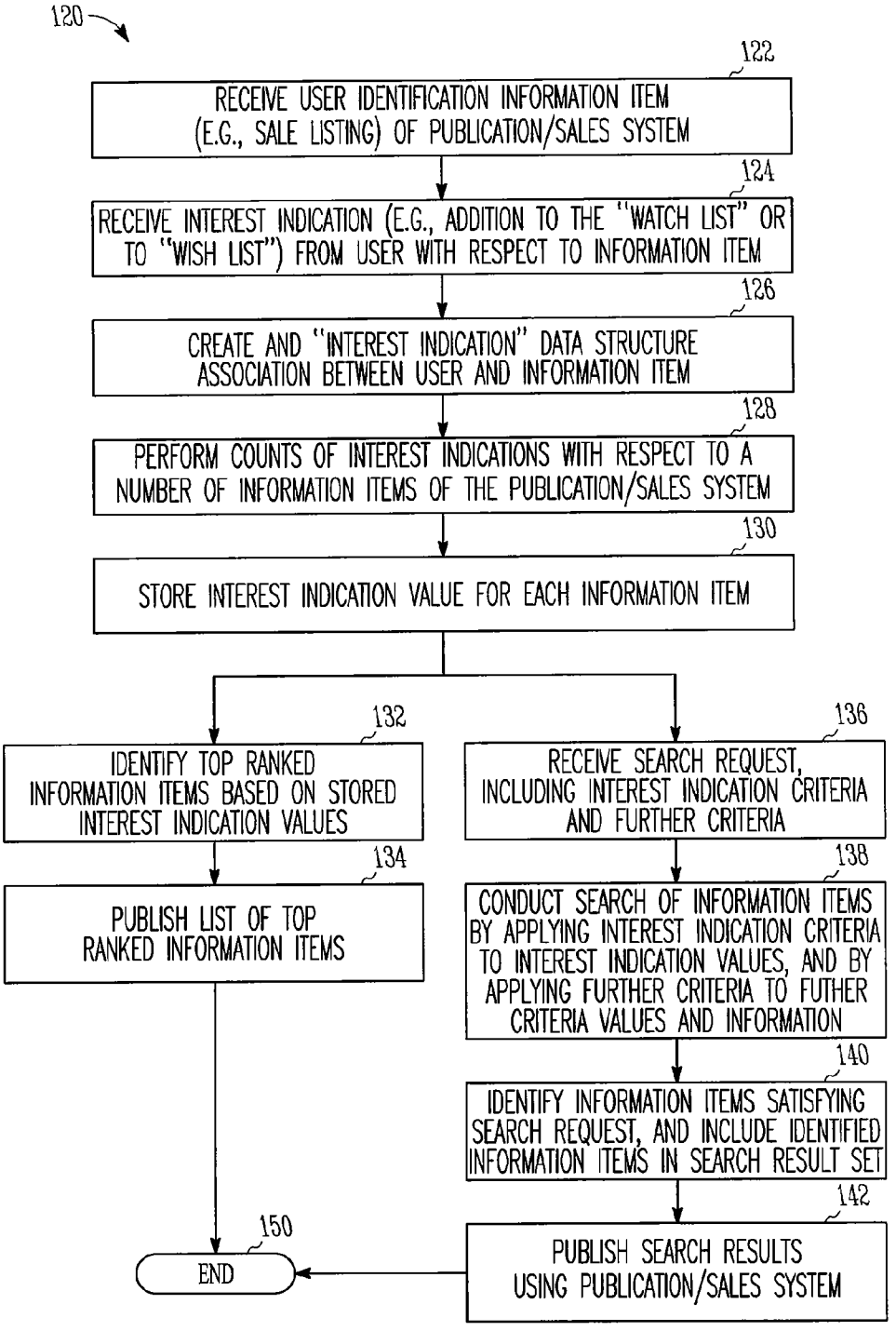

120
122
RECEIVE USER IDENTIFICATION INFORMATION ITEM (E.G., SALE LISTING) OF PUBLICATION/SALES SYSTEM
124
RECEIVE INTEREST INDICATION (E.G., ADDITION TO THE "WATCH LIST" OR TO "WISH LIST") FROM USER WITH RESPECT TO INFORMATION ITEM
126
CREATE AND "INTEREST INDICATION" DATA STRUCTURE ASSOCIATION BETWEEN USER AND INFORMATION ITEM
128
PERFORM COUNTS OF INTEREST INDICATIONS WITH RESPECT TO A NUMBER OF INFORMATION ITEMS OF THE PUBLICATION/SALES SYSTEM
130
STORE INTEREST INDICATION VALUE FOR EACH INFORMATION ITEM
132
IDENTIFY TOP RANKED INFORMATION ITEMS BASED ON STORED INTEREST INDICATION VALUES
134
PUBLISH LIST OF TOP RANKED INFORMATION ITEMS
136
RECEIVE SEARCH REQUEST, INCLUDING INTEREST INDICATION CRITERIA AND FURTHER CRITERIA
138
CONDUCT SEARCH OF INFORMATION ITEMS BY APPLYING INTEREST INDICATION CRITERIA TO INTEREST INDICATION VALUES, AND BY APPLYING FURTHER CRITERIA TO FUTHER CRITERIA VALUES AND INFORMATION
140
IDENTIFY INFORMATION ITEMS SATISFYING SEARCH REQUEST, AND INCLUDE IDENTIFIED INFORMATION ITEMS IN SEARCH RESULT SET
142
PUBLISH SEARCH RESULTS USING PUBLICATION/SALES SYSTEM
150
END

FIG. 4

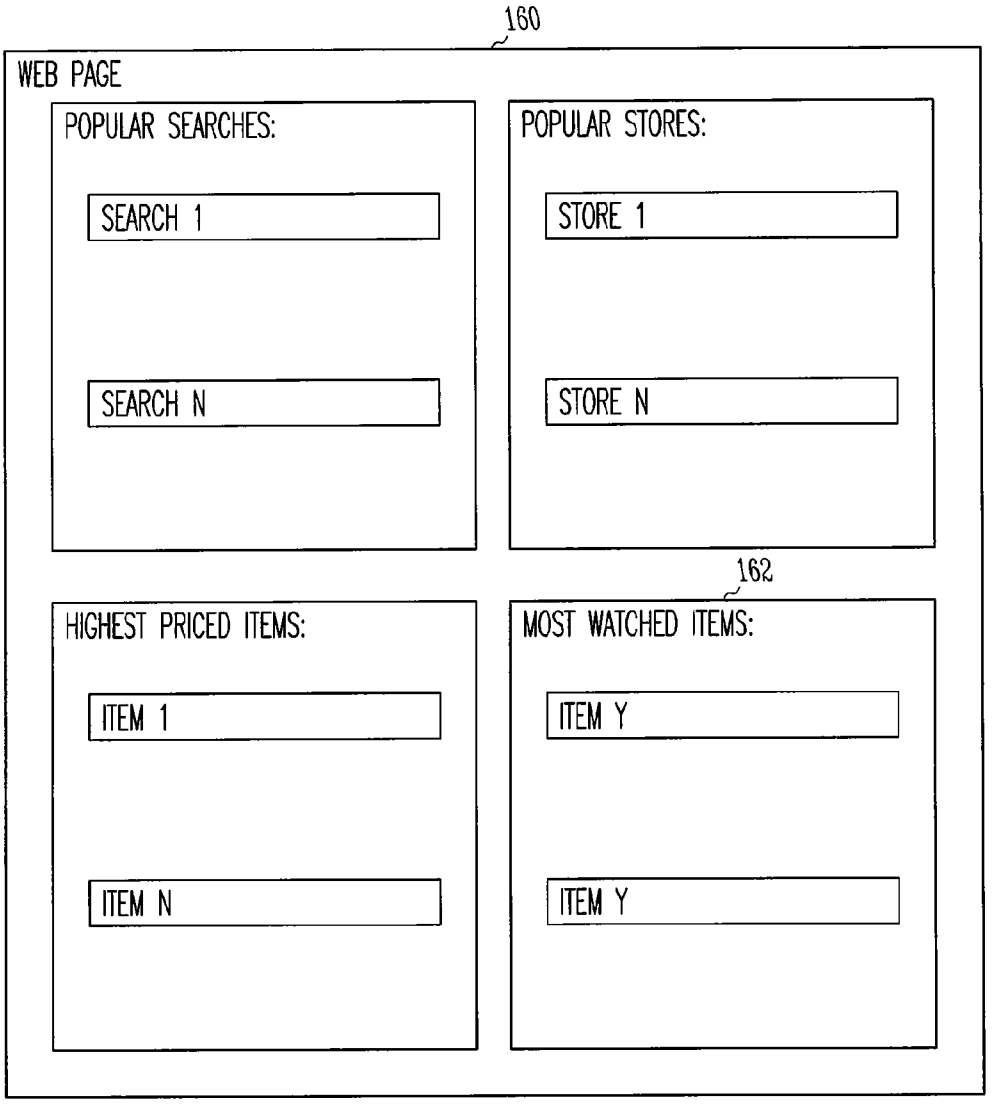

160
WEB PAGE
POPULAR SEARCHES:
SEARCH 1
SEARCH N
POPULAR STORES:
STORE 1
STORE N
162
HIGHEST PRICED ITEMS:
ITEM 1
ITEM N
MOST WATCHED ITEMS:
ITEM Y
ITEM Y

FIG. 5

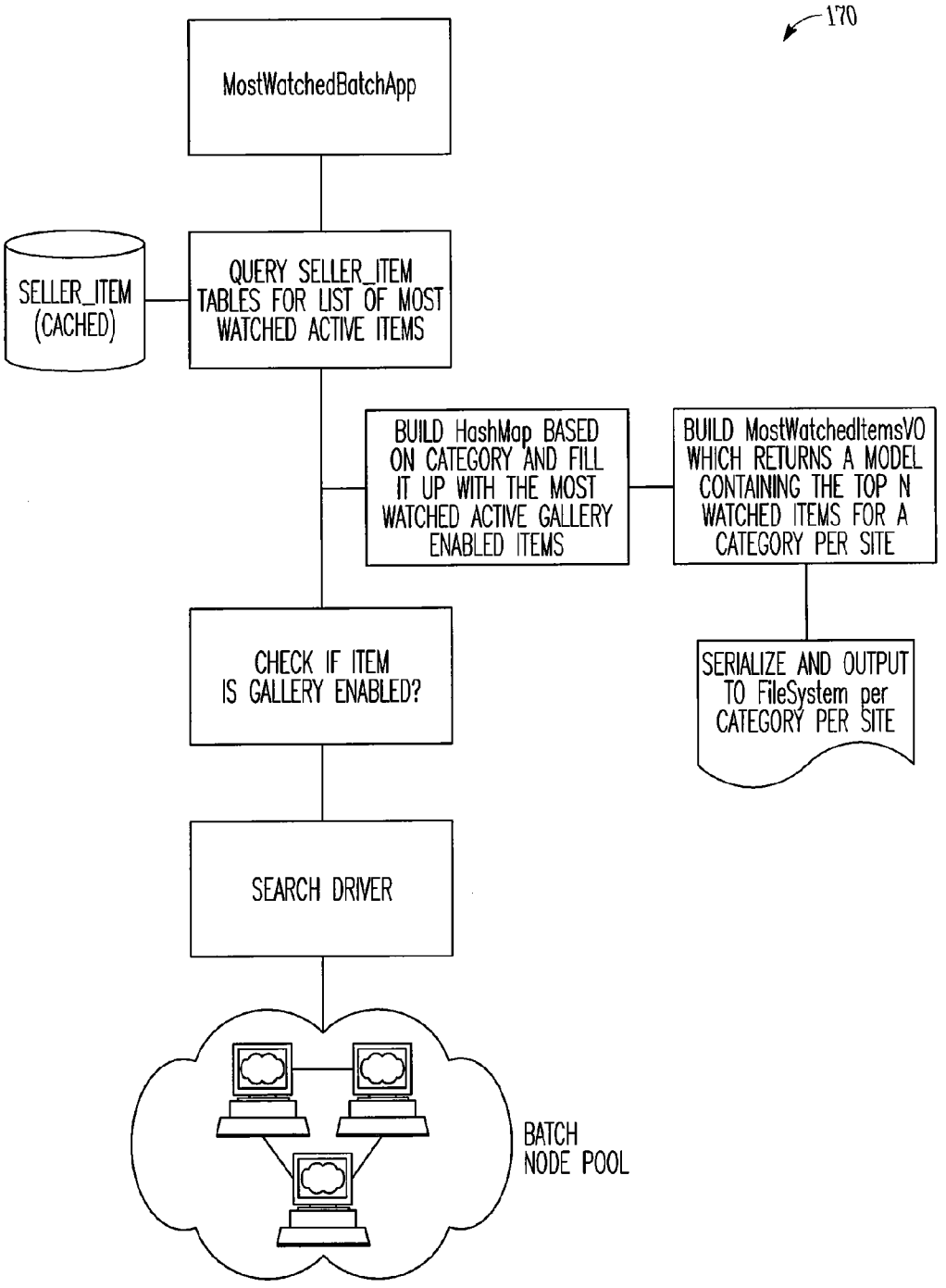

170
MostWatchedBatchApp
SELLER_ITEM (CACHED)
QUERY SELLER_ITEM TABLES FOR LIST OF MOST WATCHED ACTIVE ITEMS
BUILD HashMap BASED ON CATEGORY AND FILL IT UP WITH THE MOST WATCHED ACTIVE GALLERY ENABLED ITEMS
BUILD MostWatchedItemsVO WHICH RETURNS A MODEL CONTAINING THE TOP N WATCHED ITEMS FOR A CATEGORY PER SITE
CHECK IF ITEM IS GALLERY ENABLED?
SERIALIZE AND OUTPUT TO FileSystem per CATEGORY PER SITE
SEARCH DRIVER
BATCH NODE POOL

FIG. 6

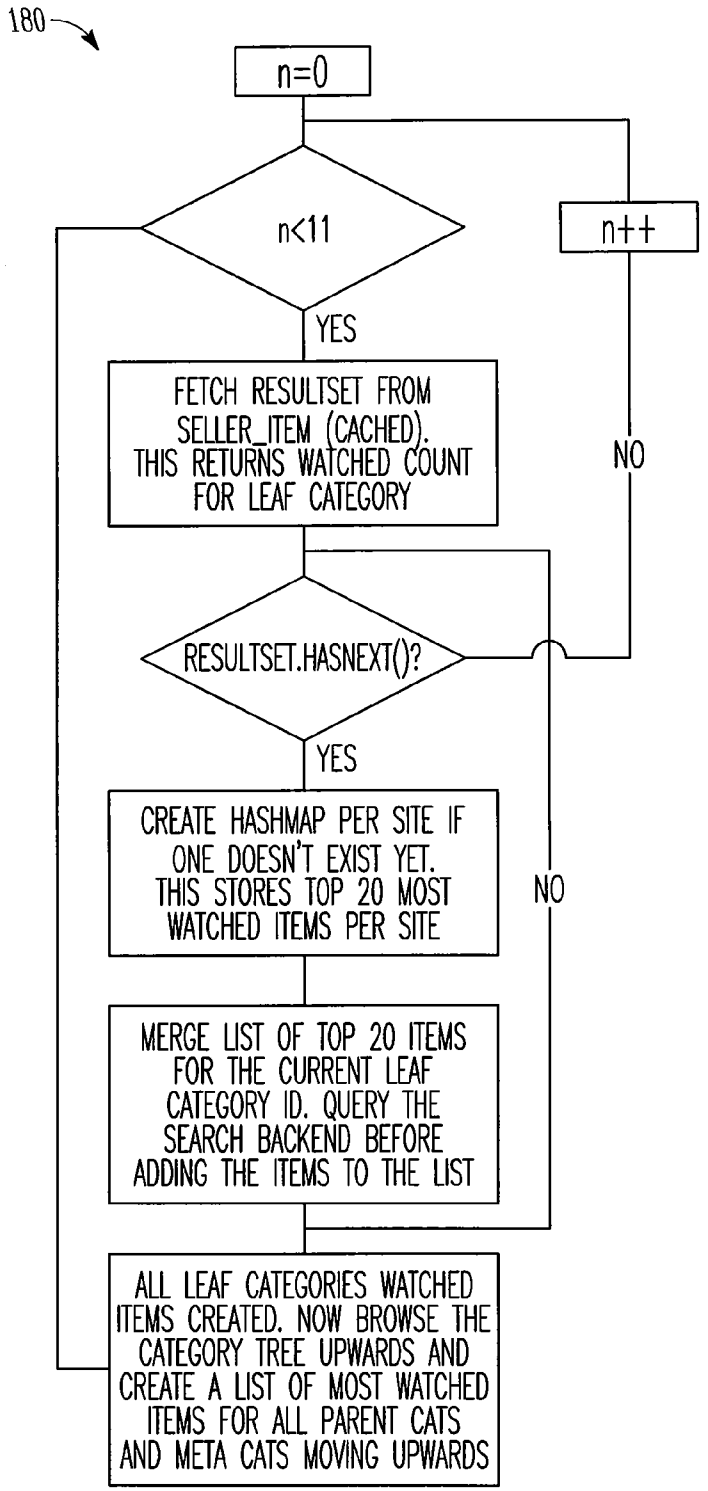

180
n=0
n<11
n++
YES
NO
FETCH RESULTSET FROM SELLER_ITEM (CACHED). THIS RETURNS WATCHED COUNT FOR LEAF CATEGORY
RESULTSET.HASNEXT()?
YES
NO
CREATE HASHMAP PER SITE IF ONE DOESN'T EXIST YET. THIS STORES TOP 20 MOST WATCHED ITEMS PER SITE
MERGE LIST OF TOP 20 ITEMS FOR THE CURRENT LEAF CATEGORY ID. QUERY THE SEARCH BACKEND BEFORE ADDING THE ITEMS TO THE LIST
ALL LEAF CATEGORIES WATCHED ITEMS CREATED. NOW BROWSE THE CATEGORY TREE UPWARDS AND CREATE A LIST OF MOST WATCHED ITEMS FOR ALL PARENT CATS AND META CATS MOVING UPWARDS

FIG. 7

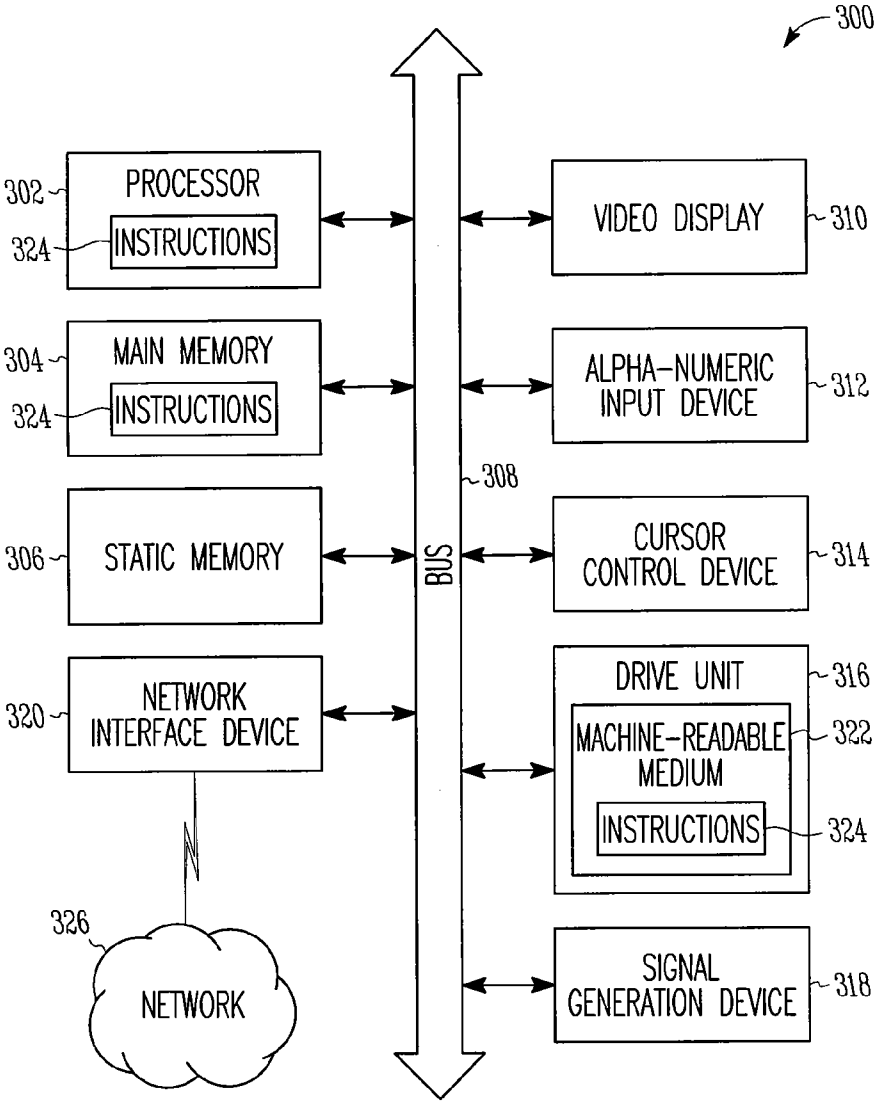

300
302
PROCESSOR
324
INSTRUCTIONS
304
MAIN MEMORY
324
INSTRUCTIONS
306
STATIC MEMORY
320
NETWORK INTERFACE DEVICE
326
NETWORK
308
BUS
VIDEO DISPLAY
310
ALPHA-NUMERIC INPUT DEVICE
312
CURSOR CONTROL DEVICE
314
DRIVE UNIT
316
MACHINE-READABLE MEDIUM
322
INSTRUCTIONS
324
SIGNAL GENERATION DEVICE
318

FIG. 8

SYSTEM TO GENERATE AN AGGREGATE INTEREST INDICATION WITH RESPECT TO AN INFORMATION ITEM

RELATED APPLICATION

[0001] The present application is a continuation of U.S. patent application Ser. No. 12/433,602 filed Jul. 16, 2009; which is a continuation of U.S. patent application Ser. No. 12/366,459 filed Feb. 5, 2009; which is a continuation of U.S. patent application Ser. No. 11/026,942 filed Dec. 30, 2004; and which in turn claims the benefit of priority under 35 U.S.C. §119(e) of U.S. Provisional Application No. 60/625,435, filed Nov. 4, 2004, the entire content of each application being incorporated herein by reference in their entirety.

TECHNICAL FIELD

[0002] Exemplary embodiments of the present invention relate generally to the technical field of data processing and, in one exemplary embodiment, to a system to generate an aggregate interest indication for an information item.

BACKGROUND

[0003] A number of websites, such as publishing websites (e.g., newspapers, etc.) and commerce websites (e.g., store or marketplace websites), allow users to add items that may be offered for sale via such websites to lists that are maintained by the relevant website, on behalf of the user. For example, certain commerce websites (e.g. Amazon.com) allow users to add items offered for sale via that website to a so-called "wish list", which is in effect a registry of items that a particular user may like to acquire. Similarly, certain marketplace websites (e.g., eBay.com) allow users to add listings to a "watch list", responsive to which the commerce websites conveniently present information (e.g., via a customized web page or by email) to the relevant user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] The present invention is illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

[0005] FIG. **1** is a diagram of an exemplary network-based commerce system, in accordance with the invention;

[0006] FIG. **2** is a block diagram illustrating exemplary multiple marketplace and payment applications;

[0007] FIG. **3** is a high-level entity-relationship diagram, illustrating various exemplary tables that may be maintained within databases of the system;

[0008] FIG. **4** is a flow chart illustrating a method, according to an exemplary embodiment of the present invention, to rank, search or otherwise generate an interest indication or measure, with respect to an information item;

[0009] FIG. **5** illustrates an exemplary user interface that is utilized to publish a list of "most watched items";

[0010] FIG. **6** is a flow chart illustrating a method, according to an exemplary embodiment of the present invention, to create a data structure of sales listings in which users have expressed or registered in interest;

[0011] FIG. **7** is a high level flow chart illustrating a method, according to exemplary embodiment of the present invention, for creating a category tree for the top n most watched items; and

[0012] FIG. **8** shows a diagrammatic representation of machine in the exemplary form of a computer system within which a set of instructions, for causing the machine to perform any one or more of the methodologies discussed herein, may be executed.

DETAILED DESCRIPTION

[0013] A method and system to generate an aggregate interest indication for an information item are described. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present invention. It will be evident, however, to one skilled in the art that the present invention may be practiced without these specific details.

Exemplary Platform Architecture

[0014] FIG. **1** is a network diagram depicting a system **10**, according to one exemplary embodiment of the present invention, having a client-server architecture. A commerce platform, in the exemplary form of a network-based commerce system or marketplace **12**, provides server-side functionality, via a network **14** (e.g., the Internet) to one or more clients. FIG. **1** illustrates, for example, a web client **16** (e.g., a browser, such as the Internet Explorer browser developed by Microsoft Corporation of Redmond, Washington State), and a programmatic client **18** executing on respective client machines **20** and **22**.

[0015] Turning specifically to the network-based marketplace **12**, an Application Program Interface (API) server **24** and a web server **26** are coupled to, and provide programmatic and web interfaces respectively to, one or more application servers **28**. The application servers **28** host one or more marketplace applications **30** and payment applications **32**. The application servers **28** are, in turn, shown to be coupled to one or more databases servers **34** that facilitate access to one or more databases **36**.

[0016] The marketplace applications **30** provide a number of marketplace functions and services to users that access the marketplace **12**. The payment applications **32** likewise provide a number of payment services and functions to users. The payment applications **30** may allow users to quantify for, and accumulate, value (e.g., in a commercial currency, such as the U.S. dollar, or a proprietary currency, such as "points") in accounts, and then later to redeem the accumulated value for products (e.g., goods or services) that are made available via the marketplace applications **30**. While the marketplace and payment applications **30** and **32** are shown in FIG. **1** to both form part of the network-based marketplace **12**, it will be appreciated that, in alternative embodiments of the present invention, the payment applications **32** may form part of a payment service that is separate and distinct from the marketplace **12**.

[0017] Further, while the system **10** shown in FIG. **1** employs a client-server architecture, the present invention is of course not limited to such an architecture, and could equally well find application in a distributed, or peer-to-peer, architecture system. The various marketplace and payment applications **30** and **32** could also be implemented as standalone software programs, which do not necessarily have networking capabilities.

[0018] The web client **16**, it will be appreciated, accesses the various marketplace and payment applications **30** and **32** via the web interface supported by the web server **26**. Simi-

larly, the programmatic client **18** accesses the various services and functions provided by the marketplace and payment applications **30** and **32** via the programmatic interface provided by the API server **24**. The programmatic client **18** may, for example, be a seller application (e.g., the TurboLister application developed by eBay Inc., of San Jose, Calif.) to enable sellers to author and manage listings on the marketplace **12** in an off-line manner, and to perform batch-mode communications between the programmatic client **18** and the network-based marketplace **12**.

[0019] FIG. **1** also illustrates a third party application **38**, executing on a third party server machine **40**, as having programmatic access to the network-based marketplace **12** via the programmatic interface provided by the API server **24**. For example, the third party application **38** may, utilizing information retrieved from the network-based marketplace **12**, support one or more features or functions on a website hosted by the third party. The third party website may, for example, provide one or more promotional, marketplace or payment functions that are supported by the relevant applications of the network-based marketplace **12**.

Exemplary Marketplace Applications

[0020] FIG. **2** is a block diagram illustrating multiple marketplace and payment applications **30** that, in one exemplary embodiment of the present invention, are provided as part of the network-based marketplace **12**. The marketplace **12** may provide a number of listing and price-setting mechanisms whereby a seller may list goods and/or services for sale, a buyer can express interest in or indicate a desire to purchase such goods and/or services, and a price can be set for a transaction pertaining to the goods and/or services. To this end, the marketplace applications **30** are shown to include one or more auction applications **44** which support auction-format listing and price setting mechanisms (e.g., English, Dutch, Vickrey, Chinese, Double, Reverse auctions etc.). The various auction applications **44** may also provide a number of features in support of such auction-format listings, such as a reserve price feature whereby a seller may specify a reserve price in connection with a listing and a proxy-bidding feature whereby a bidder may invoke automated proxy bidding.

[0021] A number of fixed-price applications **46** support fixed-price listing formats (e.g., the traditional classified advertisement-type listing or a catalogue listing) and buyout-type listings. Specifically, buyout-type listings (e.g., including the Buy-It-Now (BIN) technology developed by eBay Inc., of San Jose, Calif.) may be offered in conjunction with an auction-format listing, and allow a buyer to purchase goods or services, which are also being offered for sale via an auction, for a fixed-price that is typically higher than the starting price of the auction.

[0022] Store applications **48** allow sellers to group their listings within a "virtual" store, which may be branded and otherwise personalized by and for the sellers. Such a virtual store may also offer promotions, incentives and features that are specific and personalized to a relevant seller.

[0023] Reputation applications **50** allow parties that transact utilizing the network-based marketplace **12** to establish, build and maintain reputations, which may be made available and published to potential trading partners. Consider that where, for example, the network-based marketplace **12** supports person-to-person trading, users may have no history or other reference information whereby the trustworthiness and credibility of potential trading partners may be assessed. The reputation applications **50** allow a user, for example through feedback provided by other transaction partners, to establish a reputation within the network-based marketplace **12** over time. Other potential trading partners may then reference such a reputation for the purposes of assessing credibility and trustworthiness.

[0024] Personalization applications **52** allow users of the marketplace **12** to personalize various aspects of their interactions with the marketplace **12**. For example a user may, utilizing an appropriate personalization application **52**, create a personalized reference page at which information regarding transactions to which the user is (or has been) a party may be viewed. Further, a personalization application **52** may enable a user to personalize listings and other aspects of their interactions with the marketplace **12** and other parties.

[0025] In one embodiment, the network-based marketplace **12** may support a number of marketplaces that are customized, for example, for specific geographic regions. A version of the marketplace **12** may be customized for the United Kingdom, whereas another version of the marketplace **12** may be customized for the United States. Each of these versions may operate as an independent marketplace, or may be customized (or internationalized) presentations of a common underlying marketplace.

[0026] Navigation of the network based-marketplace **12** may be facilitated by one or more navigation applications **56**. For example, a search application enables key word searches of listings published via the network-based marketplace **12**. A browse application allows users to browse various category, catalogue, or inventory data structures according to which listings may be classified within the marketplace **12**. Various other navigation applications may be provided to supplement the search and browsing applications.

[0027] In one embodiment, the navigation applications **56** may include one or more search enhancement applications **80**, which operate to provide information to users (e.g., via a "homepage" of the network-based marketplace **12**) regarding activities that are being performed by a user community. For example in one embodiment, the search enhancement applications **80** may identify lists of top ranked listings, published by the network-based marketplace **12**. One such a list of top ranked listings may be a list of listings that are the most "monitored" by a community of users, the monitoring function being supported by an interest module **82** of the applications **80**. For example, the interest module **82** may enable a user to add a particular listing to a "watch list" or "monitored list" that is maintained by the network-based marketplace **12** on behalf of the user. The interest module **82** may also enable users to register interest with respect to a listing in one of a number of other ways, including by adding a particular listing to a "gift registry" or "wish list" that is maintained for the user. The lists may also be restricted or based on other attributes (e.g., category, price, geographic location of seller, etc.).

[0028] The search enhancement applications **80** may also include a ranking module **84** that operates to generate lists of "top-ranked listings", by measuring (e.g., counting) various metrics pertaining to listings published by the network-based marketplace **12**. For example, in one embodiment, the ranking module **84** may count the number of users that have registered interest, via the interest module **80**, in a particular listing (e.g., the users may have flagged the listing as being of potential interest). The ranking module **84** may then generate an interest indication value (e.g., a count) for each of a num-

ber of listings, and then rank the listings according to the interest indication value. A predetermined number of "top ranked listings" may then be identified by the ranking module **84**Such "top-ranked listings" may be published by the trading platform **12**.

[0029] In order to make listings, available via the network-based marketplace **12**, as visually informing and attractive as possible, the marketplace applications **30** may include one or more imaging applications **58** which users may utilize to upload images for inclusion within listings. An imaging application **58** also operates to incorporate images within viewed listings. The imaging applications **58** may also support one or more promotional features, such as image galleries that are presented to potential buyers. For example, sellers may pay an additional fee to have an image included within a gallery of images for promoted items.

[0030] Listing creation applications **60** allow sellers conveniently to author listings pertaining to goods or services that they wish to transact via the network-based marketplace **12**, and listing management applications **62** allow sellers to manage such listings. Specifically, where a particular seller has authored and/or published a large number of listings, the management of such listings may present a challenge. The listing management applications **62** provide a number of features (e.g., auto-relisting (automatically re-listing an expired listing), inventory level monitors, etc.) to assist the seller in managing such listings. One or more post-listing management applications **64** also assist sellers with a number of activities that typically occur post-listing. For example, upon completion of an auction facilitated by one or more auction applications **44**, a seller may wish to leave feedback regarding a particular buyer. To this end, a post-listing management application **64** may provide an interface to one or more reputation applications **50**, so as to allow the seller conveniently to provide feedback regarding multiple buyers to the reputation applications **50**.

[0031] Dispute resolution applications **66** provide mechanisms whereby disputes arising between transacting parties may be resolved. For example, the dispute resolution applications **66** may provide guided procedures whereby the parties are guided through a number of steps in an attempt to settle a dispute. In the event that the dispute cannot be settled via the guided procedures, the dispute may be escalated to a third party mediator or arbitrator.

[0032] A number of fraud prevention applications **68** implement various fraud detection and prevention mechanisms to reduce the occurrence of fraud within the marketplace **12**.

[0033] Messaging applications **70** are responsible for the generation and delivery of messages to users of the network-based marketplace **12**, such messages for example advising users regarding the status of listings at the marketplace **12** (e.g., providing "outbid" notices to bidders during an auction process or to provide promotional and merchandising information to users).

[0034] Merchandising applications **72** support various merchandising functions that are made available to sellers to enable sellers to increase sales via the network-based marketplace **12**. The merchandising applications **80** also operate the various merchandising features that may be invoked by sellers, and may monitor and track the success of merchandising strategies employed by sellers.

[0035] The network-based marketplace **12** itself, or one or more parties that transact via the marketplace **12**, may operate loyalty programs that are supported by one or more loyalty/promotions applications **74**. For example, a buyer may earn loyalty or promotions points for each transaction established and/or concluded with a particular seller, and be offered a reward for which accumulated loyalty points can be redeemed.

Exemplary Data Structures

[0036] FIG. **3** is a high-level entity-relationship diagram, illustrating various tables **90** that may be maintained within the databases **36**, and that are utilized by and support the marketplace and payment applications **30** and **32**. A user table **92** contains a record for each registered user of the network-based marketplace **12**, and may include identifier, address and financial instrument information pertaining to each such registered user. A user may, it will be appreciated, operate as a seller, a buyer, or both, within the network-based marketplace **12**. In one exemplary embodiment of the present invention, a buyer may be a user that has accumulated value (e.g., commercial or proprietary currency), and is then able to exchange the accumulated value for items that are offered for sale by the network-based marketplace **12**.

[0037] The tables **90** also include an items table **94** in which are maintained item records for goods and services that are available to be, or have been, transacted via the marketplace **12**. Each item record within the items table **94** may furthermore be linked to one or more user records within the user table **92**, so as to associate a seller and one or more actual or potential buyers with each item record.

[0038] A transaction table **96** contains a record for each transaction (e.g., a purchase transaction) pertaining to items for which records exist within the items table **94**.

[0039] An order table **98** is populated with order records, each order record being associated with an order. Each order, in turn, may be with respect to one or more transactions for which records exist within the transactions table **96**.

[0040] Bid records within a bids table **100** each relate to a bid received at the network-based marketplace **12** in connection with an auction-format listing supported by an auction application **44**. A feedback table **102** is utilized by one or more reputation applications **50**, in one exemplary embodiment, to construct and maintain reputation information concerning users. A history table **104** maintains a history of transactions to which a user has been a party. One or more attributes tables **106** record attribute information pertaining to items for which records exist within the items table **94**. Considering only a single example of such an attribute, the attributes tables **106** may indicate a currency attribute associated with a particular item, the currency attribute identifying the currency of a price for the relevant item as specified in by a seller.

[0041] The tables **90** are further shown to include an association data structure, in the exemplary form of a watch table **101**, that stores associations between listings, for which records are maintained in the items table **94**, and users, for which records are maintained in the user table **92**. Specifically, the watch table **101** may record registration of a user in a monitoring capacity with respect to one of more listings.

[0042] Further, the tables **90** may, in one embodiment, included an interest value table **103** in which is stored interest values for each of the listings for which records are maintained in the items table **94**. An interest value for each listing may be generated, for example, by counting the number of unique registrations of user interest (e.g., monitoring or flag-

ging) in the relevant listing. The interest values as stored within the table **103** may be generated, in one embodiment, by the ranking module **84** discussed above with reference to FIG. **2**.

[0043] According an exemplary embodiment of the present invention, there is provided a method and system to rank, search or otherwise process, information items that are published via a publication or sales system, based on the degree of user interest with respect to such an information item. For example, within the context of a commerce website (e.g., an online store or electronic marketplace), users of the relevant commerce system may indicate or register interest with respect to a specific information item (e.g., a product or service listing) in a number of ways. A user may add a particular listing to a registry (e.g., a "wish list") or to a "watch list", under which the commerce system may monitor activity pertaining to the listing with a view to providing automatic notifications regarding any activity. The commerce website may also present customized information including information regarding listings that have been added to the "watch list".

[0044] FIG. **4** is a flow chart illustrating a method **120**, according to an exemplary embodiment of the present invention, to rank, search or otherwise generate an interest indication or measure, with respect to an information item (e.g., a sale listing) that may be published via a publication and/or sales system, such as a network-based marketplace or an electronic commerce system.

[0045] The method assumes that the identity of a user, to which information is made available by a publication and/or sales system, (e.g., the network-based marketplace **12**), is known to the system. To this end, a user may have a logged into a website (e.g., using a username/password pair) operated by the publication and/or sales system. Alternatively, the identity of the user may be determined by some other mechanism, such as a cookie deposit by the publication and/or sales system.

[0046] At block **122**, user identification of a specific information item is received at the publication/sales system from the user, via the network. For example, the user may have conducted a search of information items, and have selected a particular information item as being of interest. This identification may comprise, for example, a user clicking on identification information pertaining to the information item, and the user thus navigating to a webpage dedicated primarily to the information item of interest. Taking a commerce website as an example, a user may for example, have "clicked through" a hypertext link presented in a list of search results, to be presented with a webpage providing a detailed sale listing pertaining to it.

[0047] Responsive to the user identification of the information item, a mechanism may then be presented to the user whereby the user can indicate or register interest in the item (e.g., tag the item). For example, continuing the above example of a sale listing presented on a commerce website, a button may be presented within a listing page that, when selected by a user, adds the relevant sale listing to a "wish list", registry or "watch list". In a similar fashion, the identification of the item may be a user adding the item to a so-called website "shopping cart."

[0048] In any event, responsive to user indication, via the presented mechanism, of interest in the information item, an interest indication is received, at block **124**, at the publication and/or sales system, this interest indication being received in conjunction with information identifying the user. For example, where a session identifier is utilized to maintain state between a client system and a server system, a session identifier may be included within a URL communicated from the client to the server system, the session identifier operating to identify the user. Where a cookie is stored on the client machine, information may be extracted from this cookie, and included in the information received at the publication and/or sales system, to thereby identify the user to the system.

[0049] At block **126**, the publication and/or sales system creates an interest indication data structure association between the user and the information item. For example, the publication and/or sales system may supplement a record, maintained for the user, with information to identify that the user has expressed or registered interest within an information item. In one embodiment, the publication and/or sales system may maintain a relational data base, and a relational association may be created between the user and the relevant information item.

[0050] In an alternative embodiment, as opposed to creating an association between the user and the information item, a count of the number of users that have expressed or registered interest in a particular information item maybe incremented responsive to the receipt of the interest indication at block **124**. In a further embodiment, such a count may be incremented in addition to the above described association being created.

[0051] At block **128**, the publication and/or sales system performs a count of interest indications with respect to each of a number of information items maintained thereby. As mentioned above, this may, in one embodiment, involve performing a count of the number of associations between each information item and users. In another embodiment, this may simply involve a read operation to read a number of counts that have been previously registered with respect to each of a number of information items.

[0052] At block **130**, an interest indication value, derived from the count performed at block **128**, may be stored for each information item. These interest indication values may be stored, in one embodiment, in a cache memory structure to thus improve the response times for queries that may be run against the stored interest indication values.

[0053] In one embodiment, the method **120** may then branch to block **132**, where the publication and/or sales system proceeds to identify the "top ranked" information items, based on the interest indication values. For example, the "top 10" information items, ranked according to interest indication values, may be identified at block **132**. In further embodiments, the identification of the "top ranked" information items may include the application of further criteria. For example, only information items of a particular status (e.g., active), published within certain time constraints (e.g., published in the last 24 hours), published within certain product or service categories, or including certain description information (e.g. meeting a certain price criteria) may be included within the "top ranked" information items.

[0054] At block **134**, the publication and/or sales system may publish a list of the top ranked information items. For example, this list may be published on the "homepage" of a website, thereby to provide other users of the website with a convenient indication of which information items (e.g., sales listings) of the website are receiving interest from a community of users.

[0055] FIG. **5** illustrates an exemplary user interface, in the form of a web page **160**, that is utilized to publish a list of "most watched items" **162**, this list constituting an example of a list of top ranked information items that may be published by the publication and/or sales system.

[0056] Returning to the method **120**, from block **130**, the method **120** may also branch to block **136**, where the publication and/or sales system receives a search request, including interest indication criteria as well as further criteria. For example, the search request may be received from a user, and may specify that only information items having an interest indication value exceeding a specified threshold value be returned responsive to the query. Further, the query may include further filter criteria such as status criteria (e.g., only active items), category criteria (e.g., only return sales listings within a particular product or service category), website criteria (e.g., only return sales listings published via a country specific website operated by the publication and/or sales system), price criteria (e.g., only return sales listings for which the current price is below a predetermined value), or any one of a number of other criteria.

[0057] At block **138**, the publication and/or sales system conducts a search of information items by applying the information indication criteria to the stored interest indication values, and also by applying further criteria to further criteria values and information.

[0058] At block **140**, information items that satisfy the search request are identified, and included in a search result set that is then published, via the publication and/or sales system, at block **142**.

[0059] The method then ends at block **150**.

[0060] As noted above, the interest that is registered by the publication and/or sales system in a particular information item may be registered, in one embodiment, responsive to a specific and affirmative indication by the user of interest in the information item. In the example where the information item is a sales listing, published by a commerce site or electronic marketplace, this interest indication may be received by the user invoking a monitoring or flagging function with respect to the sale listing. The monitoring function, performed by the publication and/or sales system on behalf of the user, may present information regarding monitored sales listing in a customized webpage (e.g., a portal webpage that is customized for the particular user).

[0061] Further, the monitoring function may include providing alerts to the user regarding activity (e.g., transaction activity) pertaining to the sale listings. For example, where the sale listing utilizes an auction price setting process, the monitoring function may provide a communication (e.g., an email or other electronic notification) to the user regarding bidding activity that has caused the price associated with a sale listing to increase. Further, where information presented in the sale listing includes a fixed-priced item, and a seller, subsequent to publishing as the initial sale listing, reduces a fixed asking price, the monitoring function may also communicate this type of activity pertaining to the sales listing to the user.

[0062] Turning specifically to an exemplary embodiment in which the publication and/or sales system is an electronic marketplace, the above described technologies may serve to assist in establishing the relevance, or interest levels, across dynamic and electronic marketplace. Specifically, the above described system may rank information items (e.g., sales listings) based on the number of "watches" or monitors or flags that are established with respect to an information item. In one embodiment, the ability to initiate a monitoring function, or register a specific interest indication, with respect to an information item may be limited to users that are registered with the publication and/or sales system. In this way, the system may provide a "one-member, one-vote" function.

[0063] Accordingly, an embodiment of the present invention proposes making visible to other users, interest that users in aggregate have expressed, indicated or registered with respect to a particular information item. This aggregation and presentation of interest indications may furthermore be generalized to various methods of ranking, and otherwise indicating relative relevancies. Further, by maintaining a count, or other measure, of registered interest indications with respect to information items, searching capabilities that are provided by the publication and/or sales system may be enhanced.

[0064] According to one exemplary embodiment, there is provided a system and a method to generate a list (e.g., a top 10) of most monitored (e.g., "watched") items per category per site to provide a dynamic overview of consumer interest levels within an electronic marketplace, to expose demand and encourage similar purchases by buyers, to expose demand and encourage new supply from sellers, etc. The list of watched items may be generated at least on a daily basis, and may be a generated as close to real time as possible.

[0065] The following are exemplary features for the Most Watched Items.

Most Watched Items Batch Overview

[0066] Users can, in one embodiment, add an item to a list of monitored sale listings (e.g., to their "watch list" maintained at an electronic marketplace). The Most watched items may be those active, "gallery featured" (or otherwise announced listings for) items that have the highest watch count (e.g., the most number of users are watching them). In other embodiments, the "most watched" items may be those for which the respective sale of listing has otherwise been enhanced.

[0067] The items for the Most Watched Items may be filtered as follows:

[0068] If there is a filter (e.g., a category filter, price filter, status filter etc), items will be filtered accordingly.

[0069] In a further embodiment, only listings that have the gallery feature will be included.

[0070] In yet a further embodiment, only items that are still currently active will be included.

Exemplary Functional Specification

[0071] FIG. **6** is a flow chart illustrating a method **170**, according to an exemplary embodiment of the present invention, to create a data structure of sales listings in which users have expressed or registered in interest.

[0072] In one embodiment, a MostWatchedItemsBatch job runs once a day. The batch job queries the SELLER_ITEM table and retrieves the watched items ranked within top 10 based on the watch count.

[0073] An exemplary SQL query is:

```
select * from (a
SELECT ITEM_ID , LEAF_CAT , PARENT_CAT, META_CAT,
site_id , watch_count, rank( ) over (partition by leaf_cat ,
site_id order by watch_count desc )
as dr
```

-continued

```
FROM CASH_USER.SELLER_ITEM_CACHE_IOT_X WHERE
WATCH_COUNT > 0 and end_time > sysdate )
where dr <= n
```

[0074] The batch job forms a Category tree per site (e.g., where an electronic marketplace contains many websites) and fills in the top 10 watched items for each leaf and each meta category. It may query all the IOTs and merge the data into the category tree such that the Category tree will finally have top 20 watched items per category per site.

[0075] While adding the data into the category tree, the batch job may check if the item has gallery enabled by going against search backend. ??

[0076] Once the Category tree is filled with all the relevant data, the output may be written to XML files per site per category. This may be done by a pool of threads.

Exemplary Batch job functionality

[0077] FIG. **7** is a high level flow chart illustrating a method **180**, according to exemplary embodiment of the present invention, for creating a category tree for the top n most watched items.

[0078] The exemplary method **180** includes the following operations:

[0079] 1. Query the SELLER_ITEM (e.g., cached) tables fetching the items ranked top n most ranked watched (monitored/flagged) items per category per site. 'n' is configurable and is set to 10 by default. The query may be done by calling a "SellerSale.findMostWatchedActiveItems" method call. This query may return a List object containing "SellerSaleCache"objects.

[0080] 2. Create a hashmap per site encountered in the resultset if one doesn't exist already.

[0081] 3. Aggregate the list of most ranked watched items per category and store it as a List object in a HashMap with category id as the key.

[0082] 4. For each item that potentially goes to the most watched list, query the backend node to check if the item has gallery enabled.

[0083] 5. If there are more rows in the resultset for the same category/site, calculate the most watched 20 items and merge to this list.

[0084] 6. After processing all the leaf categories obtained from the queries, browse the Category tree upwards using the CategoryBO. Merge the top 20 items from all the children categories. Fill in the list for all parent categories browsing upwards.

[0085] 7. A MostWatchedItemsVO returns a XML model for the most watched items for the given category and given site. This looks up the hashmaps created while parsing the resultset.

[0086] 8. A thread from a pool of threads may then pick up a category from the list of all categories and writes out a serialized version of the XML Model to a file named "<categoryId>.xml" in directory "site_<siteId>".

[0087] Once the batch is done, the scheduling chain may calls the script to summarize the run results and email it to an alias. The scheduling chain may be setup to run the batch every 24 hours. The scheduling chain should, in one embodiment, not automatically attempt to restart the batch if it failed. Instead the next scheduled run should be started as in a normal situation.

[0088] In one embodiment, the above-described operations may be performed as an entire back-end project, and no user interface (UI) and no user-visible changes may be presented on a website operated by an electronic marketplace.

Exemplary XML Model

[0089] As noted above, in one embodiment, the batch job composes XML as the output per site id and per category.

[0090] Below is a sample XML document that specifies exemplary tags that may be used.

```
<?xml version="1.0" encoding="ISO-8859-1"?>
< web site >
  <mostWatchedItems>
      <Item id="5712669397" rank="1"/>
      .....
      <Item id="4432146754" rank="20"/>
  </mostWatchedItems>
</web site >
```

One file per category per site may be created.

[0091] FIG. **8** shows a diagrammatic representation of machine in the exemplary form of a computer system **300** within which a set of instructions, for causing the machine to perform any one or more of the methodologies discussed herein, may be executed. In alternative embodiments, the machine operates as a standalone device or may be connected (e.g., networked) to other machines. In a networked deployment, the machine may operate in the capacity of a server or a client machine in server-client network environment, or as a peer machine in a peer-to-peer (or distributed) network environment. The machine may be a server computer, a client computer, a personal computer (PC), a tablet PC, a set-top box (STB), a Personal Digital Assistant (PDA), a cellular telephone, a web appliance, a network router, switch or bridge, or any machine capable of executing a set of instructions (sequential or otherwise) that specify actions to be taken by that machine. Further, while only a single machine is illustrated, the term "machine" shall also be taken to include any collection of machines that individually or jointly execute a set (or multiple sets) of instructions to perform any one or more of the methodologies discussed herein.

[0092] The exemplary computer system **300** includes a processor **302** (e.g., a central processing unit (CPU) a graphics processing unit (GPU) or both), a main memory **304** and a static memory **306**, which communicate with each other via a bus **308**. The computer system **300** may further include a video display unit **310** (e.g., a liquid crystal display (LCD) or a cathode ray tube (CRT)). The computer system **300** also includes an alphanumeric input device **312** (e.g., a keyboard), a cursor control device **314** (e.g., a mouse), a disk drive unit **316**, a signal generation device **318** (e.g., a speaker) and a network interface device **320**.

[0093] The disk drive unit **316** includes a machine-readable medium **322** on which is stored one or more sets of instructions (e.g., software **324**) embodying any one or more of the methodologies or functions described herein. The software **324** may also reside, completely or at least partially, within the main memory **304** and/or within the processor **302** during execution thereof by the computer system **300**, the main memory **304** and the processor **302** also constituting machine-readable media. The software **324** may further be transmitted or received over a network **326** via the network interface device **320**.

[0094] While the machine-readable medium **392** is shown in an exemplary embodiment to be a single medium, the term "machine-readable medium" should be taken to include a single medium or multiple media (e.g., a centralized or distributed database, and/or associated caches and servers) that store or embodies the one or more sets of instructions. The term "machine-readable medium" shall also be taken to include any medium that is capable of storing, encoding or carrying a set of instructions for execution by the machine and that cause the machine to perform any one or more of the methodologies of the present invention. The term "machine-readable medium" shall accordingly be taken to include, but not be limited to, solid-state memories, optical and magnetic media, and carrier wave signals.

[0095] Thus, a method and system to generate an aggregate indication for an information item have been described. Although the present invention has been described with reference to specific exemplary embodiments, it will be evident that various modifications and changes may be made to these embodiments without departing from the broader spirit and scope of the invention. Accordingly, the specification and drawings are to be regarded in an illustrative rather than a restrictive sense.

1. A system comprising:

a hardware processor; and

memory having instructions stored thereon that, in response to execution by the hardware processor, cause the system to perform operations comprising:

determining interest values associated with one or more listings of a plurality of listings, the interest values determined based on data corresponding to user interest in monitoring the one or more listings; and

identifying particular listings of the plurality of listings based on the interest values.

2. The system of claim **1**, wherein the identifying particular listings includes ranking the particular listings.

3. The system of claim **1**, wherein the identifying the particular listings includes indicating one or more of the particular listings as top-ranked listings.

4. The system of claim **1**, wherein the plurality of listings is hosted on a web page, and wherein the identifying the particular listings of the plurality of listings includes publishing the particular listings on a home page corresponding to the web page.

5. The system of claim **1**, wherein the operations further comprise:

receiving user requests to monitor the one or more listings for subsequent activity; and

wherein the data corresponding to the user interest is determined based on the user requests to monitor the one or more listings for the subsequent activity.

6. The system of claim **5**, wherein the determining the interest values is further based on the received user requests to monitor the one or more listings for the subsequent activity.

7. The system of claim **5**, wherein the operations further comprise:

measuring a number of the user requests to monitor the one or more listings for the subsequent activity, and wherein the determining the interest values is further based on the number of the user requests to monitor the one or more listings for the subsequent activity.

8. The system of claim **5**, wherein the user requests to monitor the one or more listings include at least one of adding the one or more listings to a wish list, tagging the one or more listings, or adding the one or more listings to a shopping cart.

9. The system of claim **5**, wherein the user requests are received from a particular user and wherein the operations further comprise:

receiving an identifier of the particular user;

storing the user requests from the particular user within a portion of a database that corresponds to the particular user, the storing performed based on the received identifier of the particular user.

10. The system of claim **1**, wherein the identifying the particular listings of the plurality of listings is performed on a periodic basis.

11. The system of claim **1**, wherein the operations further comprise:

receiving search criteria from a particular user, the search criteria being applied to the determined interest values associated with the one or more listings of the plurality of listings, and wherein the identifying the particular listings of the plurality of listings is further based on the received search criteria.

12. A method comprising:

determining interest values associated with one or more listings of a plurality of listings, the interest values determined based on data corresponding to user interest in monitoring the one or more listings, the determining being performed by a processor of a machine; and

identifying particular listings of the plurality of listings based on the interest values.

13. The method of claim **12**, wherein the identifying particular listings includes ranking the particular listings.

14. The method of claim **12**, wherein the identifying the particular listings includes indicating one or more of the particular listings as top-ranked listings.

15. The method of claim **12**, wherein the plurality of listings is hosted on a web page, and wherein the identifying the particular listings of the plurality of listings includes publishing the particular listings on a home page corresponding to the web page.

16. The method of claim **12**, further comprising:

receiving user requests to monitor the one or more listings for subsequent activity; and

wherein the data corresponding to the user interest is determined based on the user requests to monitor the one or more listings for the subsequent activity.

17. The method of claim **16**, wherein the determining the interest values is further based on the received user requests to monitor the one or more listings for the subsequent activity.

18. The method of claim **16**, further comprising:

measuring a number of the user requests to monitor the one or more listings for the subsequent activity, and wherein the determining the interest values is further based on the number of the user requests to monitor the one or more listings for the subsequent activity.

19. The method of claim **16**, wherein the user requests are received from a particular user and wherein the method further comprises:

receiving an identifier of the particular user; and

storing the user requests from the particular user within a portion of a database that corresponds to the particular user, the storing performed based on the received identifier of the particular user.

20. A non-transitory machine-readable medium storing instructions that, when executed by one or more processors of a machine, cause the machine to perform operations comprising:

determining interest values associated with one or more listings of a plurality of listings, the interest values determined based on data corresponding to user interest in monitoring the one or more listings; and

identifying particular listings of the plurality of listings based on the interest values.

* * * * *