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(54) **METHOD AND APPARATUS FOR REMOTELY MONITORING A SOCIAL WEBSITE**

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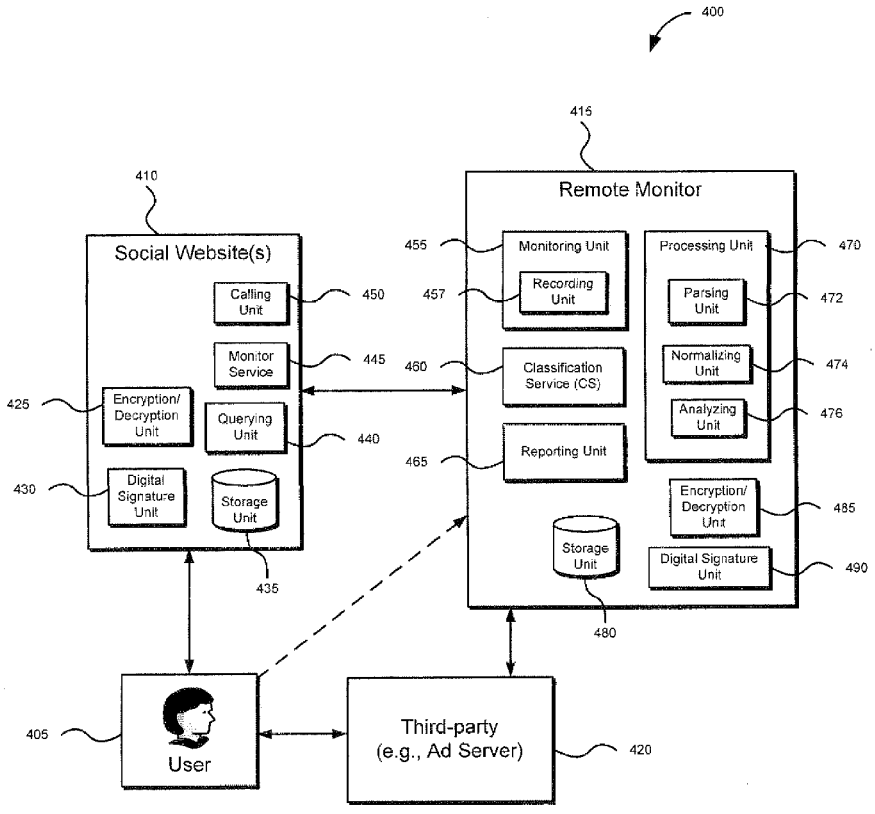
(57) **ABSTRACT**

A computer method, apparatus, system and computer program product for remotely monitoring a social website includes monitoring user activity (events) and producing user activity data. The resulting data may be processed separately from the social website. The processed user activity data may be stored and information indicative of the data may be reported. Monitoring user activity may be in response to a call from a social website. Thus, a plurality of websites may be monitored and data from these websites may be normalized. Remotely monitoring a plurality of social websites allows the invention system to identify activity/data trends, such as individual or group user trends, or larger societal trends identifiable across the plurality of websites. The invention may monitor user activity in a substantially real-time manner or alternatively may store indicative user activity data for later processing. User activity data may also be encrypted/decrypted and/or authenticated to ensure data integrity.



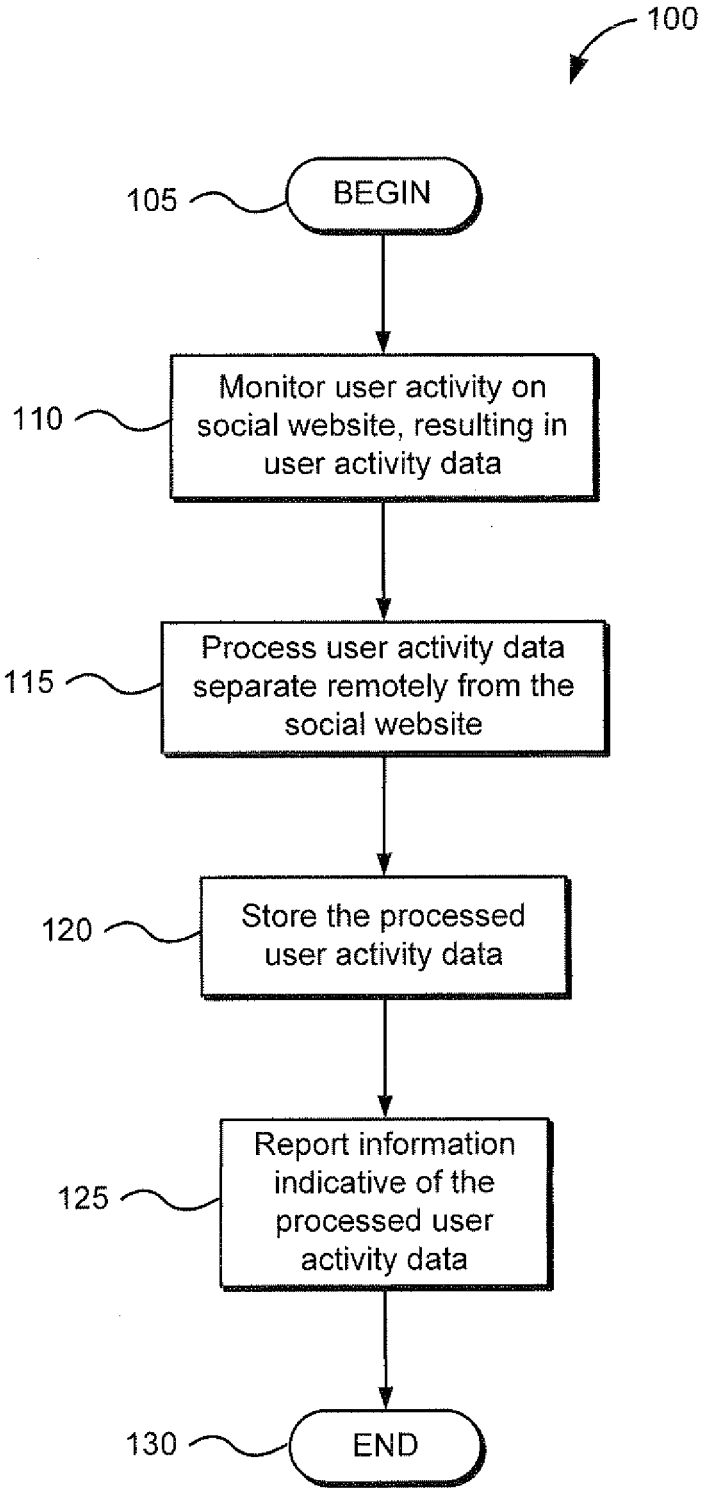

100
105
BEGIN
110
Monitor user activity on social website, resulting in user activity data
115
Process user activity data separate remotely from the social website
120
Store the processed user activity data
125
Report information indicative of the processed user activity data
130
END

FIG. 1

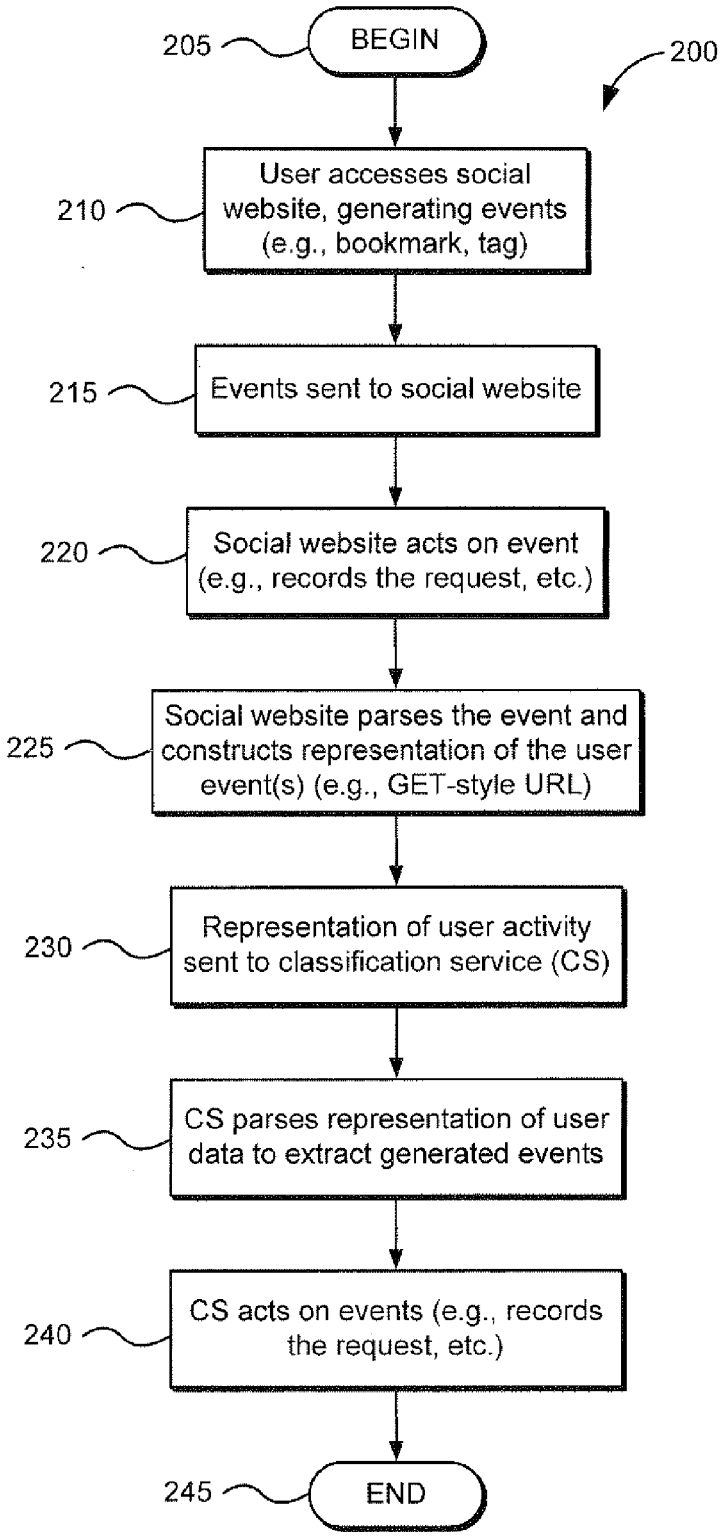

205
BEGIN
200
210
User accesses social website, generating events (e.g., bookmark, tag)
215
Events sent to social website
220
Social website acts on event (e.g., records the request, etc.)
225
Social website parses the event and constructs representation of the user event(s) (e.g., GET-style URL)
230
Representation of user activity sent to classification service (CS)
235
CS parses representation of user data to extract generated events
240
CS acts on events (e.g., records the request, etc.)
245
END

FIG. 2

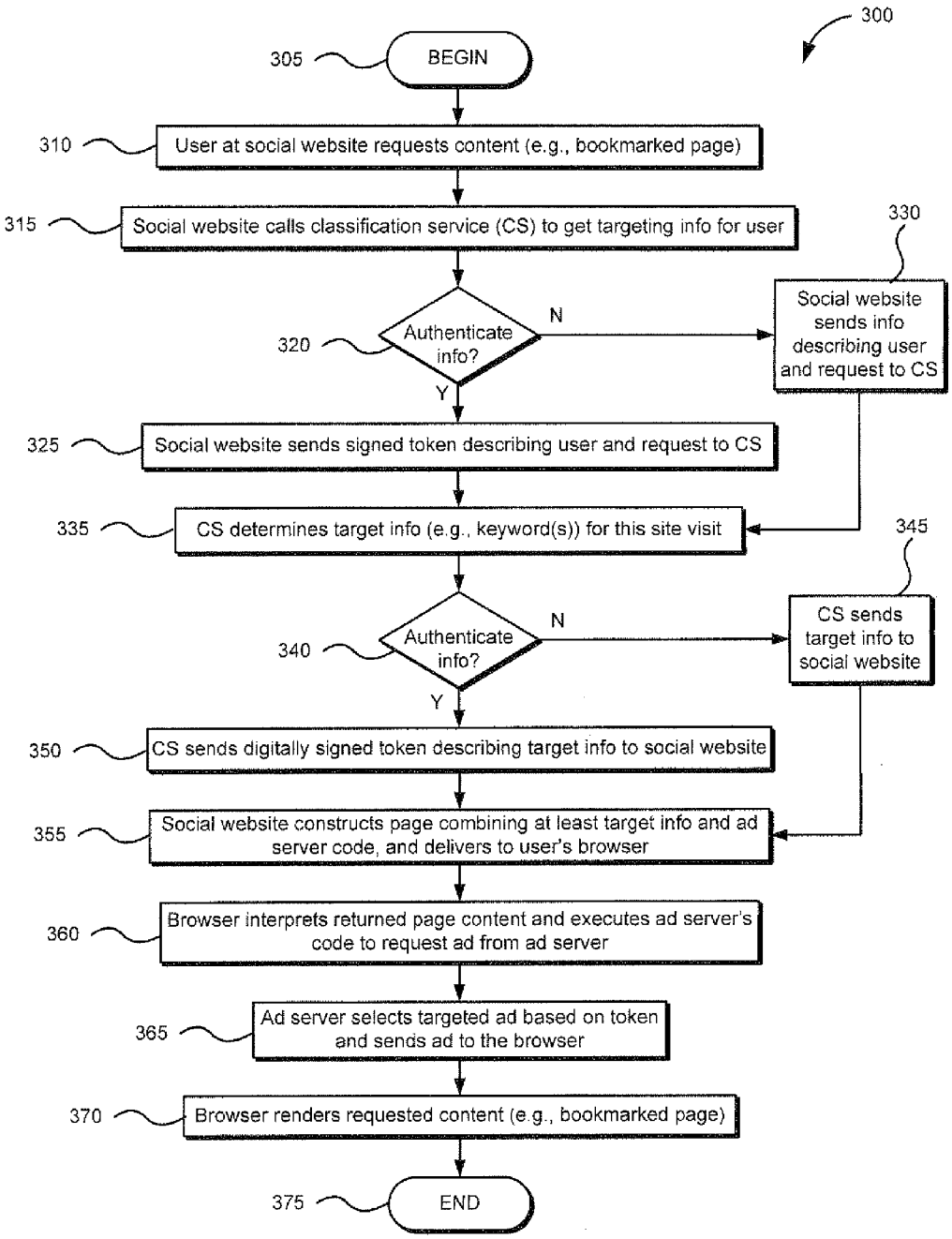

300
305
BEGIN
310
User at social website requests content (e.g., bookmarked page)
315
Social website calls classification service (CS) to get targeting info for user
330
Social website sends info describing user and request to CS
320
Authenticate info?
N
Y
325
Social website sends signed token describing user and request to CS
335
CS determines target info (e.g., keyword(s)) for this site visit
345
CS sends target info to social website
340
Authenticate info?
N
Y
350
CS sends digitally signed token describing target info to social website
355
Social website constructs page combining at least target info and ad server code, and delivers to user's browser
360
Browser interprets returned page content and executes ad server's code to request ad from ad server
365
Ad server selects targeted ad based on token and sends ad to the browser
370
Browser renders requested content (e.g., bookmarked page)
375
END

FIG. 3

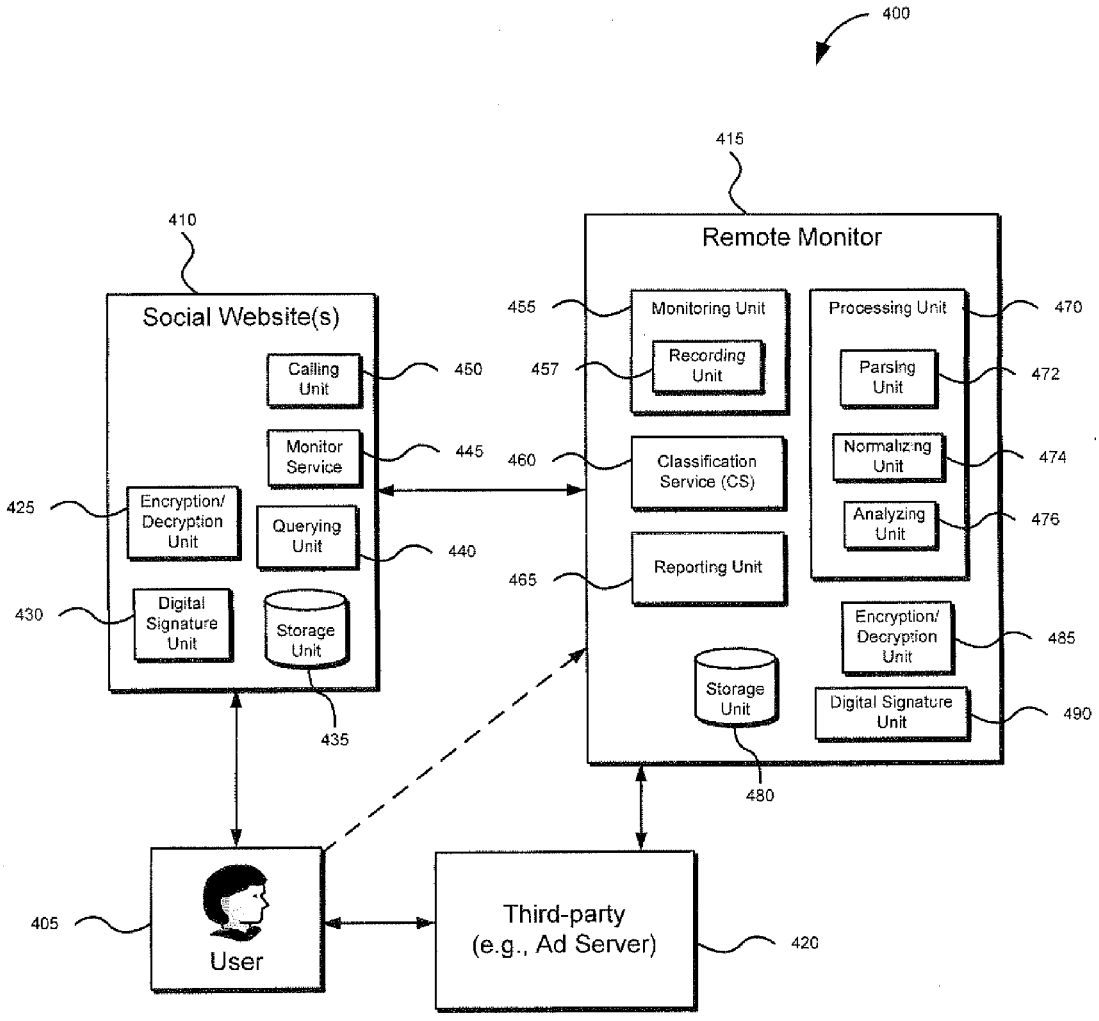

400
415
Remote Monitor
410
Social Website(s)
455
Monitoring Unit
Recording Unit
457
Processing Unit
470
Parsing Unit
472
Calling Unit
450
Monitor Service
445
460
Classification Service (CS)
Normalizing Unit
474
425
Encryption/ Decryption Unit
Querying Unit
440
Analyzing Unit
476
Reporting Unit
465
430
Digital Signature Unit
Storage Unit
Encryption/ Decryption Unit
485
Storage Unit
Digital Signature Unit
490
435
480
405
User
Third-party (e.g., Ad Server)
420

FIG. 4

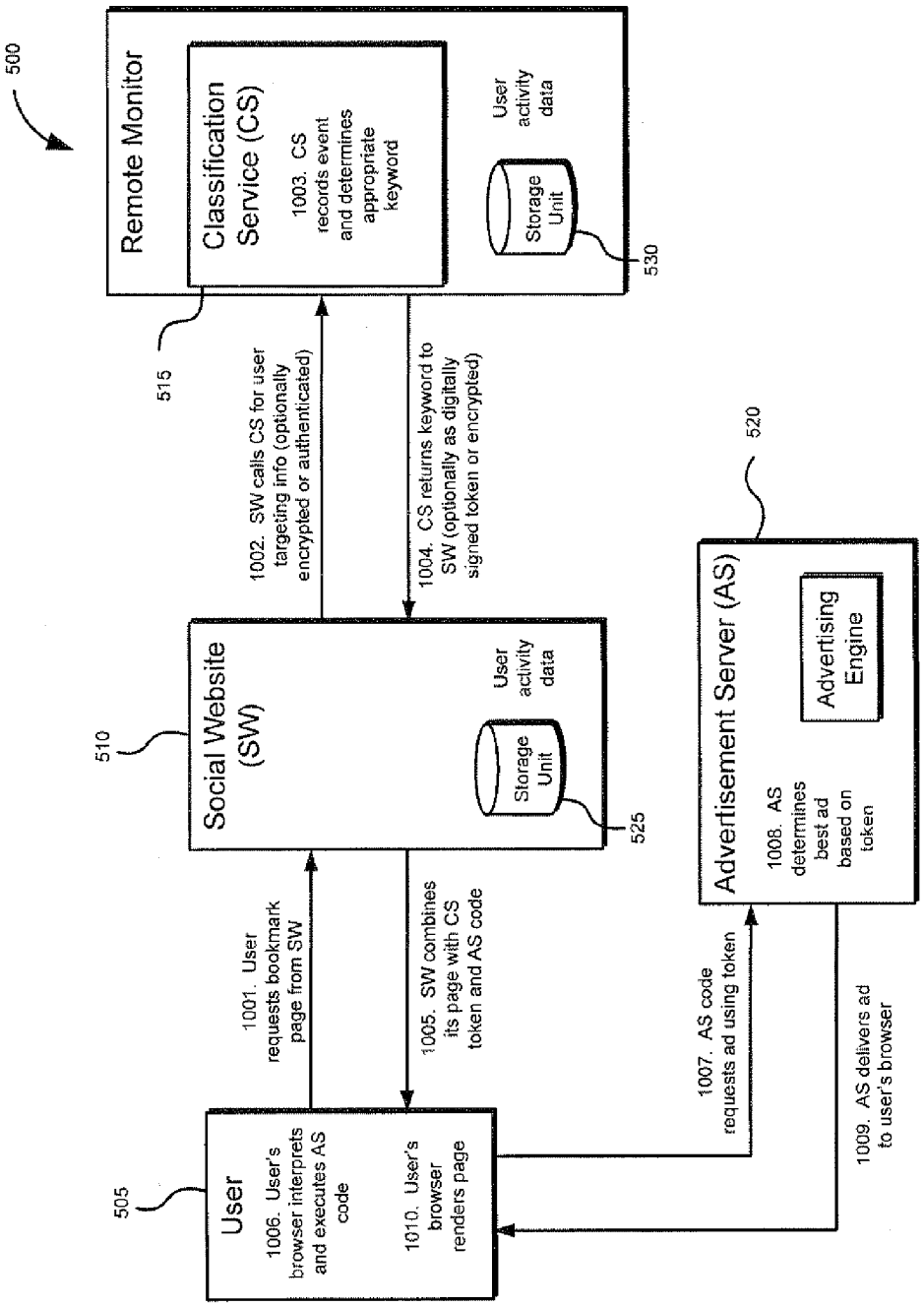

500
Remote Monitor
Classification Service (CS)
1003. CS records event and determines appropriate keyword
User activity data
Storage Unit
530
515
1002. SW calls CS for user targeting info (optionally encrypted or authenticated)
1004. CS returns keyword to SW (optionally as digitally signed token or encrypted)
510
Social Website (SW)
User activity data
Storage Unit
525
520
Advertisement Server (AS)
1008. AS determines best ad based on token
Advertising Engine
1001. User requests bookmark page from SW
1005. SW combines its page with CS token and AS code
1007. AS code requests ad using token
1009. AS delivers ad to user's browser
505
User
1006. User's browser interprets and executes AS code
1010. User's browser renders page

FIG. 5

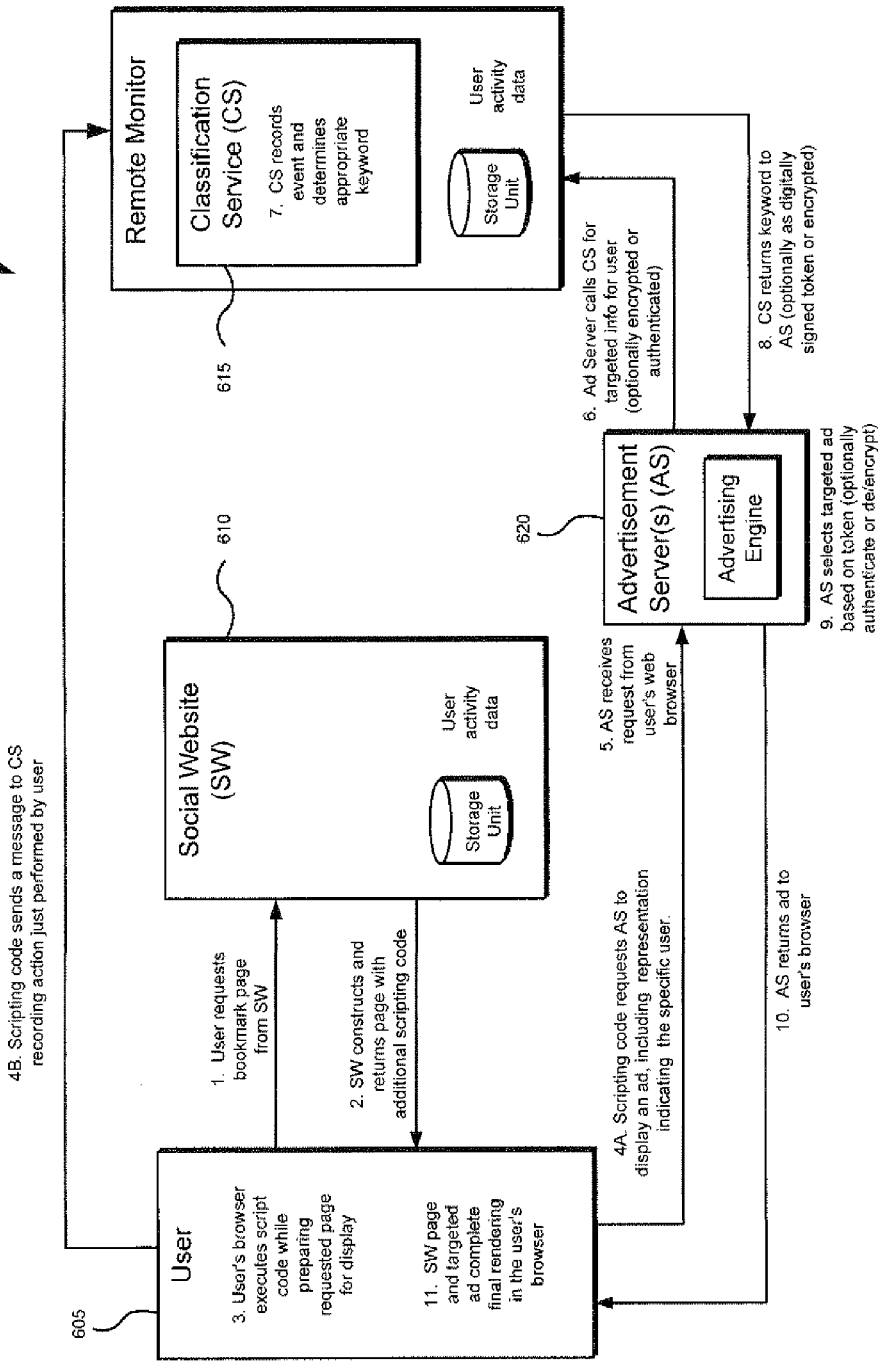

600
Remote Monitor
Classification Service (CS)
7. CS records event and determines appropriate keyword
User activity data
Storage Unit
615
6. Ad Server calls CS for targeted info for user (optionally encrypted or authenticated)
8. CS returns keyword to AS (optionally as digitally signed token or encrypted)
620
Advertisement Server(s) (AS)
Advertising Engine
9. AS selects targeted ad based on token (optionally authenticate or decrypt)
610
Social Website (SW)
User activity data
Storage Unit
5. AS receives request from user's web browser
4B. Scripting code sends a message to CS recording action just performed by user
1. User requests bookmark page from SW
2. SW constructs and returns page with additional scripting code
4A. Scripting code requests AS to display an ad, including representation indicating the specific user
10. AS returns ad to user's browser
605
User
3. User's browser executes script code while preparing requested page for display
11. SW page and targeted ad complete final rendering in the user's browser

FIG. 6

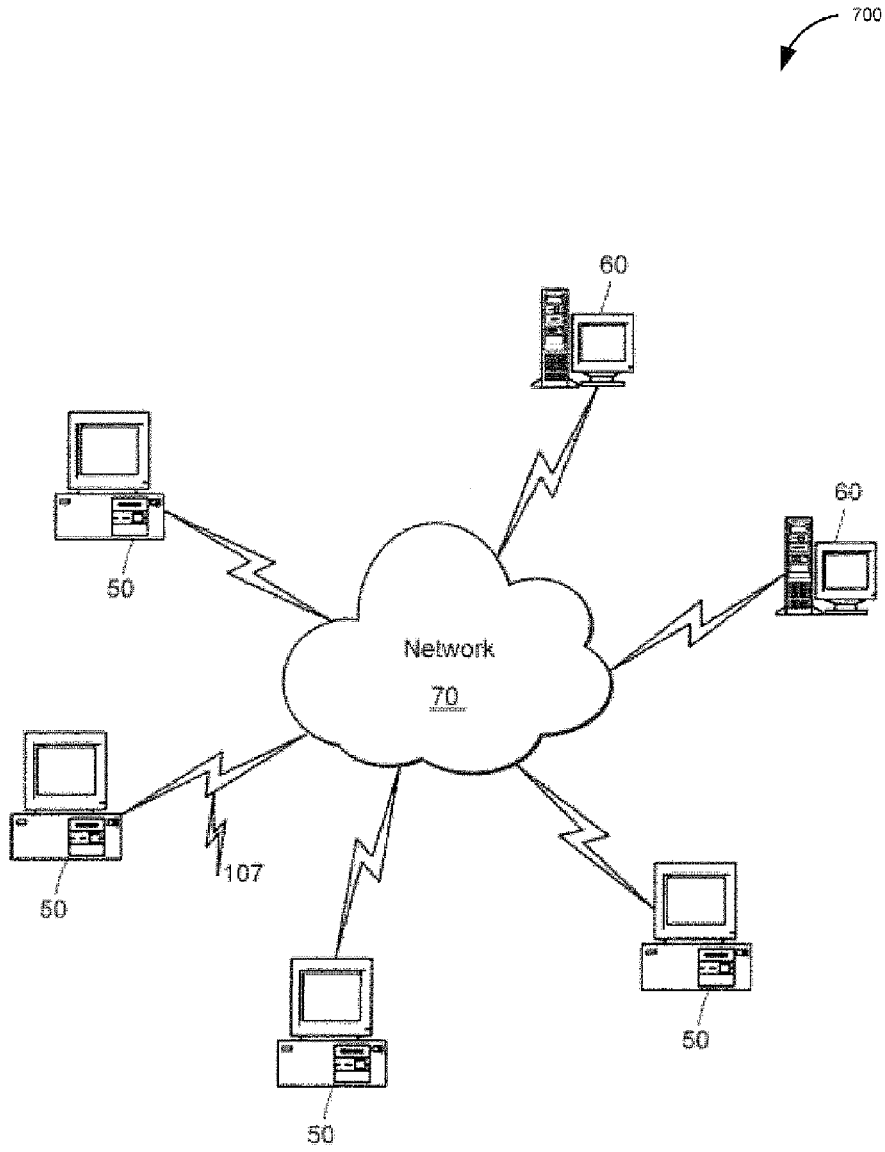



FIG. 7

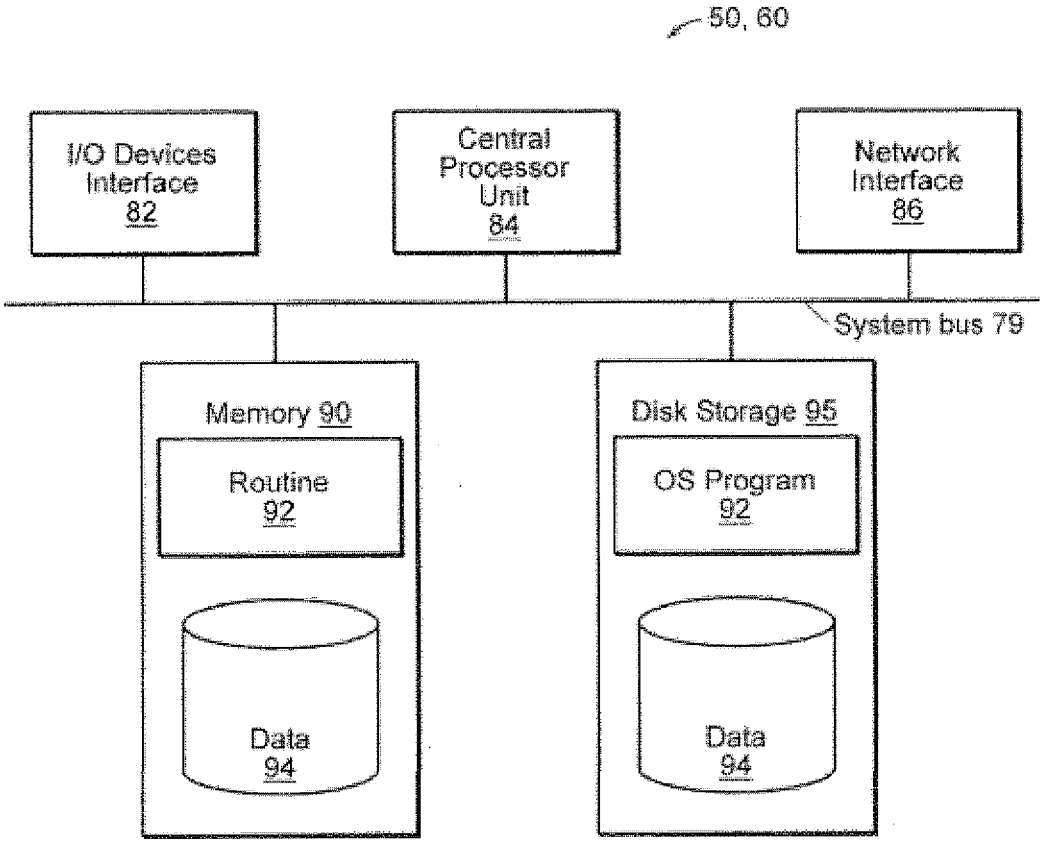

50, 60
I/O Devices Interface 82
Central Processor Unit 84
Network Interface 86
System bus 79
Memory 90
Routine 92
Data 94
Disk Storage 95
OS Program 92
Data 94

FIG. 8

# METHOD AND APPARATUS FOR REMOTELY MONITORING A SOCIAL WEBSITE

## RELATED APPLICATION(S)

**[0001]** This application is a continuation of U.S. application Ser. No. 11/833,018, filed Aug. 2, 2007, which claims the benefit of U.S. Provisional Application No. 60/835,257, filed on Aug. 2, 2006. The entire teachings of the above application(s) are incorporated herein by reference.

## BACKGROUND

**[0002]** The amount of time that consumers spend on the Internet has steadily increased, as has the variety of web content, such that the Internet is often the first place many people turn to when searching for information, news, or entertainment. Consumers use a variety of methods to search for desired information on the Internet such as entering terms in a search engine. When a site of interest is found, users often times will bookmark the site to facilitate return visits. Over time, a user may develop a list of relevant sites based on a number of different topics. However, the constantly increasing number of websites has increased the time and effort it takes to weed through relevant websites.

**[0003]** Social networks provide another method for consumers to more quickly locate websites of interest. One example of social websites are social bookmark sites where users share their bookmarks with other users. The user will save bookmarks or tags associated with a web page of interest at the bookmark website. Users may also "tag" a website by associating a term or label with the website allowing the categorization of different sites based on the tag.

**[0004]** Thus, rather than using a search engine where software alone searches for a website based on content, social bookmark sites effectively use human beings (i.e., the users themselves) to rate and sort websites. Consequently, because a user found a webpage relevant enough to bookmark or tag, websites based on a particular topic are likely to be more relevant than software generated searches. Users may search other users' bookmarks based on the topic they are interested in to quickly locate relevant web sites.

**[0005]** In addition, the very nature of a user's bookmarking and tagging behavior inherently identifies a user's interest in particular topics—much more than current methods which rely on page content, often, a simple "keyword presence" or in some cases, a more sophisticated linguistic processing of the page the user is viewing. Furthermore, while the user may arrive at a page of interest, most techniques do little to "know" the actual intentions of the user. While there are some techniques that try to deduce actual intention by performing tracking on a user's past behavior, they do so on the basis of identifying which pages have already been browsed by the user, thereby assuming that viewing a page indicates significant personal interest in the topics on that page where no such significant interest may actually exist.

## SUMMARY

**[0006]** The present invention addresses the foregoing problems in the prior art. In particular, the invention provides a method and apparatus for remotely monitoring a social website for the purpose of centrally aggregating activity.

**[0007]** In a preferred embodiment, the inventive computer implemented method and system for remotely monitoring a social website comprises (a) monitoring user activity on a remote social web site that results in user activity data, (b) processing the user activity data separately from the social website that is being monitored, and (c) storing the processed user activity data. Information indicative of the processed user activity data may be reported.

**[0008]** In accordance with an example embodiment of the invention, monitoring user activity may be a response to a call from the social website triggered by user activity at the social website, for example, an application programming interface (API) call. Alternatively, the system may monitor user activity by polling a monitoring service installed on the remote social website on a periodic, aperiodic, or event driven basis. Monitoring may effectively log or record user activity, and may be further represented in the form of a uniform resource locator (URL).

**[0009]** In accordance with another example embodiment, the invention may parse user activity data from a plurality of social websites and then "normalize" or "standardize" the parsed user activity data. The processed results may be stored in, for example, a searchable data store such as a database. The results from the plurality of websites may also be centralized in a common database. Processing user activity data may include performing on-the-fly analysis of the data or the data may be stored and analyzed at a later time.

**[0010]** In another embodiment, a classification system (CS) may be queried prior to displaying a requested web page at the social website. The classification system determines user target information as a part of the invention processing user activity data. A report may be communicated to a remote third-party or back to the social website, and may communicate the stored processed user activity data.

**[0011]** In accordance with yet another example embodiment, user activity may be monitored by locally tracking and accumulating user activity at the social website. The accumulated activity may be communicated to a classification service (CS), and may be performed in a substantially real-time manner, or in a periodic, aperiodic, or event driven basis. The classification system determines user target information as a part of the invention processing user activity data. The reported user activity data may be in the form of metadata, and may take the form of, for example, user ID, timestamp information, IP address, etc.

**[0012]** According to one example embodiment of the invention the report may include communicating data representative of other user activity to a third party, such as an advertisement server. According to another embodiment, communicated information may be encrypted prior to communicating or transmitting the data, and may similarly be decrypted at a receiving location. In addition, or alternatively, data may also be authenticated in order to, for example, circumvent requests from unauthorized third parties.

**[0013]** In another embodiment, user activity data may be processed in a substantially real-time manner. The invention may remotely monitor a plurality of social websites, where, for example, tagging all bookmarking website content by the user is allowed.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0014]** The foregoing will be apparent from the following more particular description of example embodiments, as illustrated in the accompanying drawings in which like reference characters refer to the same parts throughout the different views. The drawings are not necessarily to scale, emphasis instead being placed upon illustrating embodiments.

**[0015]** FIG. **1** is a flow diagram of an example embodiment of the present invention.

**[0016]** FIG. **2** is a flow diagram of an alternative example embodiment of the present invention.

**[0017]** FIG. **3** is a flow diagram of another alternative embodiment of the present invention.

**[0018]** FIG. **4** is a block diagram illustrating different components of a remote monitor system embodying the present invention.

**[0019]** FIG. **5** is a schematic illustration depicting dataflow according to one embodiment of the present invention.

**[0020]** FIG. **6** is a schematic illustration depicting dataflow according to an alternative embodiment of the present invention.

**[0021]** FIG. **7** is a schematic view of a computer network environment in which the principles of the invention may be implemented.

**[0022]** FIG. **8** is a block diagram of the internal structure of a computer from the FIG. **7** computer network environment.

## DETAILED DESCRIPTION

**[0023]** A description of example embodiments follows.

**[0024]** The teachings of all patents, published applications and references cited herein are incorporated by reference in their entirety.

**[0025]** A description of example embodiments of the invention follows.

**[0026]** The popularity of social networks and social bookmarking websites has grown dramatically such that they now number in the hundreds. The higher the number and variety of users a social bookmark site attracts, the more likely relevant websites will be found. However, recent analysis of a number of social websites has revealed that large number of bookmarks and tags are from a disproportionately small number of highly active users, thus, potentially skewing a particular website's effectiveness across the general public. To make better use of social networks, it would be useful to remotely monitor and centrally aggregate social websites to provide a larger number and variety of user bookmarks and tags from which to derive and analyze user activity thereby improving trend identification and targeting advertisements.

**[0027]** A user's bookmark and tag information may be valuable as market research data. For example, a user who has bookmarked or tagged digital photography sites would be of interest to photographic equipment suppliers. Furthermore, as discussed above, aggregating user activity data across the large number of social websites would facilitate the identification of user and societal trends. For example, if webpages associated with the term "water parks" are bookmarked/tagged at a high frequency, ads displayed to users with those bookmarks could command an additional cost premium.

**[0028]** The current invention provides a technique for remotely monitoring one or more social websites **410** (FIG. **4**) where the resulting user activity data is processed and stored remotely, i.e., separately from the social website **410**. To monitor user activity data or "events" on a remote social website **410**, the technique may install a small amount of software code into the social website's operating code. The code generates a specially-formed "Observer" uniform resource locator (URL) that is sent to a remote monitor **415** when an event occurs. The parameters in the Observer URL describe the event that a user **405** performs on the social website **410**. The monitoring process tracks multiple kinds of bookmark and tag events, so the code may be installed in the subject social website's code where those events actually happen and may be invoked using, for example, UNIX's "curl", "lynx", or "wget" programs, or any compatible application that can reliably generate a standards-compliant HTTP GET query.

**[0029]** The format of the Observer URL may be as follows:

**[0030]** http://ob1.seethroo.us:8000/event/lg?user=a&bookmark=b&title=c&tag=d&event=e&ipnum=f&timestamp=g&string=h&site=i&adtag=j

**[0031]** Each parameter of the Observer URL holds a different piece of information about the event being monitored. The letters 'a' through 'j' in the example Observer URL above will be replaced with actual values when installing it on the social website's server, such as the following:

**[0032]** In user=a, the "a" may be replaced with the escaped (Web-safe) user ID of the person performing the event. For example, if the user is "jsmith", the parameter would be "user=jsmith". The monitoring process does not require an actual user name—any unique identifier that is consistently associated with the same user on the social website is permitted. For example, if the user is "jsmith" and a unique ID for jsmith is 05b7f505fb63e9737dd1fce86d8ca2a97d21654f, the parameter would be "user=05b7f505fb63e9737dd1fce86d8ca2a97d21654f".

**[0033]** In bookmark=b, the "b" may be replaced with the escaped (Web-safe) URL of the bookmark involved in the event, if any. If the event is exclusively tag-related (see below) and there is no bookmark involved, the parameter is left blank in one embodiment. For example: if the bookmark is "http://www.cnn.com/health", the parameter would be "bookmark=http%3A//www.cnn.com/health"

**[0034]** In title=c, the "c" may be replaced with the escaped (Web-safe) title of the bookmark involved in the event. If the event is exclusively tag-related (see below) and there is no bookmark title involved, the parameter is left blank in one embodiment. For example, if the title is "CNN.com-Health", the parameter would be "title=CNN.com%20-%20Health".

**[0035]** In tag=d, the "d" may be replaced with the escaped (Web-safe) tag (or comma-separated list of tags) involved in the event. If the event is exclusively bookmark-related (see below) and there is no tag involved, the parameter is left blank in one embodiment. If there is only one tag, the trailing comma may be omitted. For example, if there are three tags named "news, health, exercise", the parameter would be "tag=news%2Chealth%2Cexercise". If there is one tag named "microsoft", the parameter would be "tag=microsoft".

**[0036]** In event=e, the "e" may be replaced with the escaped (Web-safe) text describing what the event is and may include a variety of event-specific tokens, such as these examples:

**[0037]** add_bkmk (used when a new bookmark is added to the user's account)

**[0038]** click_bkmk (used when the user clicks on one of their bookmarks)

**[0039]** del_bkmk (used when the user erases a bookmark)

**[0040]** add_tag (used when the user first adds a tag onto a bookmark(s), or to their account in general)

**[0041]** view_tag (used when the user views bookmarks assigned with the same tag)

**[0042]** del_tag (used when the user erases a tag from a bookmark or their account)

**[0043]** search (used when a search is performed, either of the user's own bookmarks/tags or across the entire social website)

**[0044]** import (used when the user uploads or imports their bookmarks)

**[0045]** For example, if the user is adding a bookmark to his account, the parameter would be "event=add_bkmk." Users may also import large files containing several bookmarks.

**[0046]** In ipnum=f, the "f" may be replaced with the escaped (Web-safe) IP number of the remote host using the social website. For example, if the user's remote computer has an IP number of "207.69.101.5", the parameter would be "ipnum=207.69.101.5".

**[0047]** In timestamp=g, the "g" may be replaced with the escaped (Web-safe) timestamp of when the event occurred, using any suitable format, such as the ISO8601 format. The timestamp "Sat Sep 02 2006 00:21:13 GMT-0400 (EDT)" would be "2006-09-02T00:21:13-04:00" in ISO8601 format, for example. Thus, if the event has a timestamp of "Sat Sep 02 2006 00:21:13 GMT-0400 (EDT)" the parameter would be "timestamp=2006-09-02T00%3A21%3A13-04%3A00.

**[0048]** In string=h, the "h" may be replaced with the escaped (Web-safe) text the user performed a search on. For example, if the event is "search" and the user performed a search for "electronic arts bond", the parameter would be "string=electronic%20arts%20bond". If the event parameter does not indicate a search, then this parameter may be left blank.

**[0049]** In site=i, the "i" may be replaced with the escaped (Web-safe) id of the social website. For example, if the website is "Connectedy.com", the parameter would be "site=connectedy." As in the user parameter (above), the monitoring process does not require the actual name of the social website—any unique identifier that is consistently associated with the same social website is permitted.

**[0050]** In adtag=j, the "j" may be replaced with any value, including "y" or "n", indicating that a targeted ad should be sent back to the social website after the Observer URL has been processed by the monitoring server.

**[0051]** Thus, using the above examples, the complete URL could look like the following:

**[0052]** http://ob1.seethroo.us:8000/event/lg?user=05b7f505fb63e9737dd1fce86d8ca2a97d21654f&bookmark=http%3A//www.cnn.com/health&title=CNN.com%20-%20Health&tag=news%2Chealth%2Cexercise&event=add_bkmk&ipnum=207.6 9.101.5&timestamp=2006-09-02T00%3A21%3A13-04%3A00&string=&site=connectedy&adtag=y

**[0053]** In this manner, the event of "adding a new bookmark" on the social website may be monitored by performing the following sequence of actions:

**[0054]** 1. A developer locates the specific commands in the social website's **410** program code that are invoked when a user **405** adds a new bookmark to his account.

**[0055]** 2. Immediately preceding or following these commands, the developer edits the program to insert an additional command. This additional command, when executed, sends the Observer URL to the remote monitor **415**. The exact command used to send the Observer URL is dependent on the programming language and web serving environment used by the social website **410**.

**[0056]** 3. The developer associates each parameter in the Observer URL with whatever specific variables are used by the social website **410** to describe the event. For example, the parameter in the Observer URL that holds the name of the bookmark is called "title". If the subject social website's code normally uses "$bookmark_name" to represent this, the developer would edit the Observer URL to say "title=$bookmark_name". Note that the specifics of this will also vary, depending on the programming language and web serving environment used by the social website **410**.

**[0057]** 4. The developer repeats this process, adding the Observer URL to each place in the program code that performs each of the events that the remote monitor tracks, and adding the correct names of variables used by the social website **410** that match the Observer URL's parameters.

**[0058]** 5. Once the command that sends the Observer URL to the remote monitor **415** has been installed into the correct places in the social website's code, the remote monitor **415** can begin receiving events in real-time from the social website **410**.

**[0059]** 6. When a user **405** of the social website **410** adds a bookmark to his account, the social website **410** performs the task as normal. At virtually the same moment (either immediately preceding or following), the Observer URL is sent via a global computer network **70** (e.g., the Internet) to the remote monitor **415**. The parameters in the Observer URL contain all the details describing the event, such as the name of the bookmark, the encrypted ID of the person who is adding the bookmark, the bookmark's URL, any tags used with the bookmark, the time the bookmark is being added, the IP number of the person's computer, and whatever other metadata have been included in the Observer URL.

**[0060]** 7. The remote monitor **415** continually waits for Observer URLs to be sent. When the remote monitor **415** receives a request containing the Observer URL, it accepts the URL as input and the monitoring program **455**, **470** runs.

**[0061]** 8. The monitoring program **455**, **470** accepts the request and parses the text of the URL to assign each parameter into a dedicated field in a local database **480**. The URL's parameters are separated, decoded/unescaped and used to construct a new data record in memory **480**.

**[0062]** 9. Once the data record is assembled and stored in memory, the record is written into the storage unit (e.g., database) **480**. At this point the original event at the social website **410** has been effectively duplicated and recorded by the remote monitor **415**.

**[0063]** 10. Once the record has been saved in, for example, a storage unit (e.g., database) **480**, the remote monitor **415** may or may not reply. If the "adtag" parameter in the Observer URL has a value of 'n', the monitoring server **415** may close the network connection without any reply to the

social website **410**. This is to ensure that the social website **410** will continue performing its normal tasks as quickly as possible, without waiting for a monitoring response that may not arrive, perhaps due to a network error, programming bug, or some other problem. Alternately, if the "adtag" parameter in the Observer URL has a value of 'y', then the remote monitor **415** will use the information from the Observer URL to choose an advertisement that is a suitable match.

**[0064]** 11. The selection of the ad can be done either locally, by accessing a store of ads to be sent to the social website **410** in reply to the monitored event, or remotely, by sending a descriptive token or keyword to a third-party ad server **420**, which then selects an ad and returns it to be displayed on the social website **410**.

**[0065]** Referring now to FIG. **1**, a flow diagram illustrating an example embodiment of the invention is depicted. The process **100** begins **105** and monitors user activity on a social website at step **110**. The monitoring step/process results in user activity data such as that described above. The resulting user activity data is processed separately or remotely from the social website that step **115**. After processing step **115**, the invention process **100** may store (step **120**) processed user activity data in, for example, a searchable data store. Information indicative of the processed user activity data may be reported at step **125**. The process **100** may then end **130**.

**[0066]** FIG. **2** is a flow diagram illustrating an alternative example embodiment of the invention. The invention process **200** begins **205** with a user accessing a social website **210** whereby a variety of events are generated (step **210**). For example, users **405** of a social bookmarking site **410** may access their bookmarks thereby generating events involving bookmark links and tags, such as "add bookmark," "click bookmark," and "add tag." These events may be sent to a social website (step **215**) via a computer or other communication network, such as the Internet, as requests to the social bookmarking server.

**[0067]** The social website **410** may act on the events (step **220**). For example, a social bookmarking site **410** may receive the bookmarking and/or tag events and the server may perform actions to process the request. The social bookmarking site **410** records the request (or otherwise acts on it, executing whatever code is programmed). The social bookmarking site **410** may also parse the details of the request and construct a representation of user activity (step **225**), such as a GET-style URL (such as that discussed above) to describe the event that was just recorded. Next, the social website **410** sends the representation of user activity (e.g., the GET URL) to a classification service (CS) **460** (in FIG. **4**) at step **230** in FIG. **2**.

**[0068]** The classification service **460** receives the representation of user data and parses it to extract generated events (step **235**), such as parameters describing the event that was just recorded, or the URL can remain unparsed and recorded unchanged, for later processing. The classification service **460** then acts on the events (step **240**), such as recording the request (or executing whatever code is programmed). The process **200** then ends **245**.

**[0069]** FIG. **3** is a more detailed flow diagram illustrating an example embodiment of the present invention. The process **300** begins **305** with a user **405** at a social website **410** requesting content (step **310**) via a web browser, for example, a page containing the user's bookmarks. The social web site **410** then calls a classification service **460** to get targeting information for the user (step **315**). To ensure integrity of the received data, the social website **410** may authenticate the information at step **320**. The process **300** continues and at step **325** the social website **410** sends either a signed token describing the user **405** and request to the classification service **460**, or at step **330** sends an unauthenticated version of the information describing the user **405** and request to the classification service **460**.

**[0070]** The classification service **460** determines target information at step **335**, such as appropriate keywords and may also record the event. The classification system **460** then sends target information to the social website at step **345**, or may optionally authenticate the information at step **340** and send a digitally signed token describing the target information to the social website at step **350**. The social website **410** then constructs a webpage combining its own content, the target information and advertisement server code and delivers it to the user at step **355**. The user's browser interprets the returned page's content and executes the advertisement server's code to request an ad from the advertisement server **420**. Next, the advertisement server **420** selects a targeted ad based on the targeted information or token and then sends the ad back to the user's browser at step **365**. After receiving the targeted ad, the users browser renders the content, for example, the combined requested bookmark page and the targeted ad at step **370**. The process **300** then ends **375**.

**[0071]** FIG. **4** is a block diagram of a remote monitoring system **400** according to an example embodiment of the invention. The remote monitoring system **400** may contain a remote monitor **415** which includes a monitoring unit **455**, classification service (CS) **460**, reporting unit **465**, processing unit **470**, storage unit **480**, encryption/decryption unit **485**, and digital signature unit **490**. The system **400** may remotely monitor user **405** activity on at least one remote social website **410**. The social website **410** may include an encryption/decryption unit **425**, digital signature unit **430**, storage unit **435**, querying unit **440**, monitor service **445**, and calling unit **450**. A monitoring service unit **445** may be configured to monitor user activity **405** on a remote social website **410**, resulting in user activity data. The processing unit **470** is configured to process the results user activity data separately from the social website **410**, in a substantially real-time manner, or processed at a later time. The user activity data may be stored in the storage unit **480**. The reporting unit **465** may be configured to report information indicative of the processed user activity data.

**[0072]** The monitoring unit **455** may be configured to monitor user **405** activity in response to a call from the social website's **410** calling unit **450** that may be triggered by the user's activity at the social website. The call may be an application programming interface (API) call, or similar call known in the art. Alternatively the monitoring unit **455** may be configured to poll the monitor service **445** that is installed on the remote social website **410** on a periodic, aperiodic, or event-driven basis. In either case, the monitoring unit **455** effectively logs or records the user's activity. In one embodiment the user activity data may be represented in the form of a uniform resource locator (URL). And in another example embodiment, a monitoring unit **455** may be configured to locally track and accumulate user activity at the remote social website **410**, and may communicate the user

activity data to the CS **460** where the CS determines user target information on a periodic, aperiodic, or event-driven basis.

**[0073]** The processing unit **470**, through use of a parsing unit **472** may parse the user activity data results from the remotely monitored social websites(s) **410**. The normalizing unit **474** may "normalize" or "standardize" the parsed user activity data. That is, social websites **410** may store particular data fields using slightly different identifiers. For example, one social website **410** may store the user's identity in a field labeled "user" and another social website **410** may store the same information in a field "userID" and still another social website may use the label "username." Thus, the invention normalizing unit **474** effectively standardizes non standardized field names from a variety of social websites **410** using a common label or identifier allowing the aggregation of user activity data from virtually every social website. Advantageously, the invention aggregates data from a plurality of social websites **410** allowing the identification of trends not currently identifiable, such as trends across a large number of users or more broadly such as societal trends. To facilitate this analysis, the storage unit **480** may be configured to store the processed results in a centralized, searchable data store such as a database where the normalizing unit **474** has standardized the results data. Alternatively this information may be distributed across multiple storage units **480** to provide data redundancy, increased search speeds, and other benefits known in the art.

**[0074]** The processing unit **470** may also be configured to perform on-the-fly analysis of the user activity data, or alternatively, may store the user activity data for analysis at a later time. The querying unit **440** of the social website **410** may also be configured to query the CS **460** before the social website displays the user requested page where the CS **460** determines user target information. In an example embodiment, the reporting unit **465** may be further configured to communicate and transmit the stored process user activity data to a third party, such as an advertisement server **420**. The reporting unit **465** may also be configured to report user activity data represented in the form of metadata or other data or file formats known in the art. Alternatively, or in addition, the reporting unit **465** may also be configured to generate a targeted advertisement based on user activity data and may communicate that advertisement to a third-party **420** or to the social website **410** for display in the user's **405** browser.

**[0075]** The user activity data may be protected using a variety of data protection techniques known to those skilled in the art. For example, the encryption/decryption unit **485** of remote monitor **415** may encrypt data prior to transmitting the data to the social website **410** where in turn the encryption/decryption unit **425** of the social website **410** will then decrypt the information. It should be understood that in order to provide effective data protection the encryption/decryption process may occur throughout the entire chain of data transmission, including but not limited to, from the social website **410** to the remote monitor **415**, from the remote monitor **415** to the third-party server **420**, from the third-party server **420** to the remote monitor **415**, and from the remote monitor **415** to the social website **410**. Alternatively, or in addition, the digital signature unit **490** may be used to authenticate data according to data authentication techniques known in the art. This may be useful in circumventing fraudulent requests (e.g., metadata, spam, etc.) from unauthorized third parties, for example, preventing a third-party from writing bogus data to the remote monitoring unit **415**.

**[0076]** The social website **410** may be a website where users are allowed to associate a tag or bookmark to the social website's content. Social websites have proliferated at an increasingly rapid rate such that there are now hundreds of social websites currently in operation. The invention **400** may also be used in conjunction with other social websites **410**, such as blogs or any other website that allows the use of tags to be added and/or associated with content.

**[0077]** FIG. **5** is a schematic diagram representing data flow in an example embodiment **500** of the invention. The remote monitoring system **500** may comprise a classification system (CS) **515** implemented using, for example, a processor (not shown). A user **505** may request a bookmark page from a social website **510** (step **1**). The social website **510** then calls the CS **515** in order to obtain user targeting information (step **2**). As mentioned above this communication may be encrypted, and digitally signed or otherwise made secure. The CS **515** may record the event in a storage unit **530**, such as a searchable database. The CS **515** may also analyze previous and/or current activity data for the user **505** as previously recorded in storage unit **530** in order to determine an appropriate keyword or multiple keywords (step **3**). In this embodiment, the CS **515** is guaranteed to record the event before the CS performs its ad selecting analysis.

**[0078]** The CS **515** then returns the determined keyword (s) either as it is, or encrypted, or as a digitally signed token back to the social website **510** (step **4**). The social website **510** then combines its page with the CS keyword/token and advertisement server code (step **5**). Alternatively, the CS can return both the keyword(s) and the advertisement server code together. Next, in response the user's browser interprets the received combined page and executes the advertisement server code (step **6**). The advertisement server code may then request an ad using the received keyword/token (step **7**). The advertisement server **520** may determine the best ad based on the subject keyword/token (step **8**). The advertisement server **520** then delivers the determined ad to the user's browser (step **9**) where the user's browser then renders the user's requested page (step **10**).

**[0079]** FIG. **6** is a schematic diagram representing data flow in and alternative example embodiment **600** of the invention. This embodiment similarly begins with the user **605** requesting, for example, a bookmark page from a social website **610** (step **1**). Here, however, the social website **610** constructs a webpage and returns the page to the user **605** with additional scripting code (step **2**). The users browser **605** executes the scripting code while preparing the requested webpage for display (step **3**). Next, the scripting code may use a forked process to request the advertisement server **620** to display in the ad where the request includes a representation indicating a specific user (step **4**A) and may also send a message to the CS **615** recording the action just performed by the user (step **4**B). Because this embodiment **600** uses a forked process, the CS **615** is not guaranteed to record the event before the CS performs its ad selecting analysis.

**[0080]** Next, the advertisement server **620** receives a request from the user's web browser **605** (step **5**) and then calls the CS **615** for targeted information for that specific user (step **6**). The CS **615** responsively analyzes the request

and determines an appropriate keyword (step **7**). The CS **615** then returns a keyword or digitally signed token to the advertisement server **620** (step **8**). If the data was authenticated the advertisement server **620** confirms the token's authenticity using CS's public key or other authentication techniques known to one skilled in the art. Next, the advertisement service **620** selects a targeted ad based on the received token/keyword (step **9**) and returns the determined ad to the user's browser **605** (step **10**). Then the page returned by the social website **610** (step **2**) is combined with the targeted ad and sent to the user's browser **605** for rendering (step **11**).

**[0081]** As mentioned previously, various communications may be made secured digitally signed encrypted/decrypted between the various modules (**405**, **410**, **415**, **420**, **505**, **510**, **515**, **520**, **605**, **610**, **615**, **620**) in FIGS. **4**, **5** and **6**.

**[0082]** The block diagrams of FIGS. **4**, **5**, and **6** are merely representative and that more or fewer units may be used, and operations may not necessary be divided up as described herein. Also, a processor executing software may operate to execute operations performed by the units, where various units, separately or in combination may represent a processor, field programmable gate array (FPGA), application specific integrated circuit (ASIC), or the like. It should be understood that the block diagrams may, in practice, be implemented in hardware, firmware, or software. If implemented in software, the software may be any form capable of performing operations described herein, stored on any form of computer readable-medium, such as RAM, ROM, CD-ROM, and loaded and executed by a general purpose or application specific processor capable of performing operations described herein.

**[0083]** FIG. **7** illustrates a generalized computer network **700** or similar digital processing environment in which the invention may be implemented.

**[0084]** Client computer(s)/devices **50** and server computer (s) **60** provide processing, storage, and input/output devices executing application programs and the like. Client computer(s)/devices **50** can also be linked through communications network **70** to other computing devices, including other client devices/processes **50** and server computer(s) **60**. Communications network **70** can be part of a remote access network, a global network (e.g., the Internet), a worldwide collection of computers, Local area or Wide area networks, and gateways that currently use respective protocols (TCP/IP, Bluetooth, etc.) to communicate with one another. Other electronic device/computer network architectures are suitable.

**[0085]** FIG. **8** is a diagram of the internal structure of a computer **50**, **60** (e.g., client processor/device **50** or server computers **60**) in the computer system of FIG. **7**. Each computer **50**, **60** contains system bus **79**, where a bus is a set of hardware lines used for data transfer among the components of a computer or processing system. Bus **79** is essentially a shared conduit that connects different elements of a computer system (e.g., processor, disk storage, memory, input/output ports, network ports, etc.) that enables the transfer of information between the elements. Attached to system bus **79** is I/O device interface **82** for connecting various input and output devices (e.g., keyboard, mouse, displays, printers, speakers, etc.) to the computer **50**, **60**. Network interface **86** allows the computer to connect to various other devices attached to a network (e.g., network **70** of FIG. **7**). Memory **90** provides volatile storage for computer software instructions **92** and data **94** used to implement an embodiment of the present invention (e.g., remote monitoring, processing, storing and reporting code **63** detailed above). Disk storage **95** provides non-volatile storage for computer software instructions **92** and data **94** used to implement an embodiment of the present invention. Central processor unit **84** is also attached to system bus **79** and provides for the execution of computer instructions.

**[0086]** In one embodiment, the processor routines **92** and data **94** are a computer program product (generally referenced **92**), including a computer readable medium (e.g., a removable storage medium such as one or more DVD-ROM's, CD-ROM's, diskettes, tapes, etc.) that provides at least a portion of the software instructions for the invention system. Computer program product **92** can be installed by any suitable software installation procedure, as is well known in the art. In another embodiment, at least a portion of the software instructions may also be downloaded over a cable, communication and/or wireless connection. In other embodiments, the invention programs are a computer program propagated signal product **107** embodied on a propagated signal on a propagation medium (e.g., a radio wave, an infrared wave, a laser wave, a sound wave, or an electrical wave propagated over a global network such as the Internet, or other network(s)). Such carrier medium or signals provide at least a portion of the software instructions for the present invention routines/program **92**.

**[0087]** In alternate embodiments, the propagated signal is an analog carrier wave or digital signal carried on the propagated medium. For example, the propagated signal may be a digitized signal propagated over a global network (e.g., the Internet), a telecommunications network, or other network. In one embodiment, the propagated signal is a signal that is transmitted over the propagation medium over a period of time, such as the instructions for a software application sent in packets over a network over a period of milliseconds, seconds, minutes, or longer. In another embodiment, the computer readable medium of computer program product **92** is a propagation medium that the computer system **50** may receive and read, such as by receiving the propagation medium and identifying a propagated signal embodied in the propagation medium, as described above for computer program propagated signal product.

**[0088]** Generally speaking, the term "carrier medium" or transient carrier encompasses the foregoing transient signals, propagated signals, propagated medium, storage medium and the like.

**[0089]** In some embodiments computer system **40** employs a Windows™ (Microsoft) operating system, in other embodiments a Linux operating system, and in other embodiments a UNIX™ operating system. Other operating systems and system configurations are suitable. Applicant claims trademark rights to the terms "Seethroo", "Seethroo Observer", and "Observer URL."

**[0090]** While this invention has been particularly shown and described with references to preferred embodiments thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the scope of the invention encompassed by the appended claims.

**[0091]** For example, the present invention may be implemented in a variety of computer architectures. The computer

network of FIGS. **7** and **8** are for purposes of illustration and not limitation of the present invention.

**[0092]** While example embodiments have been particularly shown and described, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the scope of the embodiments encompassed by the appended claims.

What is claimed is:

**1**. A method to remotely monitor a social website, comprising:

monitoring user activity on a remote social website, resulting in user activity data;

processing the user activity data separate from the social website;

storing the processed user activity data; and

reporting information indicative of the processed user activity data.

**2**. The method according to claim **1** wherein monitoring user activity is in response to a call from the social website triggered by user activity at the social website.

**3**. The method according to claim **2** wherein the call is an API call.

**4**. The method according to claim **1** wherein monitoring includes polling a monitoring service installed on the remote social website periodically, aperiodically, or on an event driven basis.

**5**. The method according to claim **1** wherein the step of monitoring effectively logs or records user activity.

**6**. The method according to claim **5** wherein user activity data is represented in the form of a uniform resource locator (URL).

**7**. The method according to claim **1** wherein processing includes parsing the user activity data from at least one social website and normalizing the parsed user activity data.

**8**. The method according to claim **1** wherein storing includes storing the processed results in a centralized, searchable data store.

**9**. The method according to claim **1** wherein processing includes performing on-the-fly analysis of the user activity data.

**10**. The method according to claim **1** further including querying a classification service (CS) prior to displaying a requested web page at the social website, wherein the CS determines user target information.

**11**. The method according to claim **1** wherein reporting includes communicating the stored processed user activity data to a third-party location.

**12**. The method according to claim **1** wherein monitoring includes locally tracking and accumulating user activity at the social website and communicating the resulting user activity data to a classification service (CS), wherein the CS determines user target information periodically, aperiodically, or on an event-driven basis.

**13**. The method according to claim **1** wherein reporting includes reporting user activity data represented by metadata.

**14**. The method according to claim **1** wherein reporting includes generating a targeted advertisement based on user activity data.

**15**. The method according to claim **1** wherein reporting includes communicating data representative of user activity to an advertisement server.

**16**. The method according to claim **1** wherein processing includes processing user activity data in a substantially real-time manner.

**17**. The method of claim **1** wherein the method remotely monitors a plurality of social websites.

**18**. The method of claim **1** wherein the social website is a website allowing use of tagging or bookmarking associated with website content.

**19**. An apparatus to remotely monitor a social website, comprising:

a monitoring unit configured to monitor user activity on a remote social website, resulting in user activity data;

a processing unit configured to process the user activity data separate from the social website;

a storage unit configured to store the processed user activity data; and

a reporting unit configured to report information indicative of the processed user activity data.

**20**. The apparatus according to claim **19** wherein the monitoring unit is configured to monitor user activity in response to a call from the social web site triggered by user activity at the social website.

**21**. The apparatus according to claim **20** wherein the call is an Application Programming Interface (API) call.

**22**. The apparatus according to claim **19** wherein the monitoring unit configured to poll a monitor service installed on the remote social website on a periodic, aperiodic, or event-driven basis.

**23**. The apparatus according to claim **19** wherein monitoring unit configured to effectively log or record user activity.

**24**. The apparatus according to claim **23** wherein user activity data is represented in the form of a uniform resource locator (URL).

**25**. The apparatus according to claim **19** wherein the processing unit is configured to parse the user activity data from at least one social website and normalize the parsed user activity data.

**26**. The apparatus according to claim **19** wherein the storage unit is configured to store the processed results in a centralized, searchable data store.

**27**. The apparatus according to claim **19** wherein the processing unit is configured to perform on-the-fly analysis of the user activity data.

**28**. The apparatus according to claim **19** further including a querying unit configured to query a classification service (CS) prior to displaying a requested web page at the social website, wherein the CS determines user target information.

**29**. The apparatus according to claim **19** wherein the reporting unit is configured to communicate the stored processed user activity data to a third-party location.

**30**. The apparatus according to claim **19** wherein the monitoring unit is configured locally track and accumulate user activity at the social website and communicate the user activity data to a classification service (CS), wherein the CS determines user target information on a periodic, aperiodic, or event-driven basis.

**31**. The apparatus according to claim **19** wherein the reporting unit is configured to report user activity data represented by metadata.

**32**. The apparatus according to claim **19** wherein the reporting unit is configured to generate a targeted advertisement based on user activity data.

**33**. The apparatus according to claim **19** wherein the reporting unit is configured to report data representative of user activity to an advertisement server.

**34**. The apparatus according to claim **19** wherein the processing unit is configured to process user activity data in a substantially real-time manner.

**35**. The apparatus according to claim **19** wherein the apparatus is configured to remotely monitor a plurality of social websites.

**36**. The apparatus according to claim **19** wherein the social website is a website where users associate a tag or bookmark with website content.

**37**. A computer program product for remotely monitoring a social website, the computer program product comprising a computer readable medium having computer readable instructions stored thereon, which, when loaded and executed by a processor, causes the processor to:

monitor user activity on a remote social website, resulting in user activity data;

process the user activity data separate from the social website;

store the processed user activity data; and

report information indicative of the processed user activity data.

**38**. A system to remotely monitor a social website, comprising:

means for monitoring user activity on a remote social website, resulting in user activity data;

means for processing the user activity data separate from the social website;

means for storing the processed user activity data; and

means for reporting information indicative of the processed user activity data.

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