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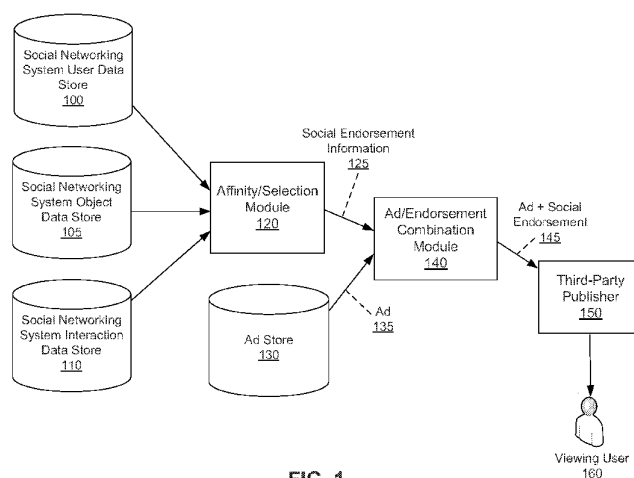


FIG. 1

(57) Abstract: A social networking system provides an advertisement for display to a viewing user along with a social endorsement, which contains information about a friend of the viewing user in the social networking system. The endorsement is selected from the social information maintained by the social networking system. To select the endorsement, the system identifies social networking system objects related to the advertisement as well as interactions between these objects and other users who are connected to the viewing user in the system, where each interaction relates to a candidate social endorsement. An affinity score may be computed for each candidate social endorsement, where the affinity scores represent a measure of the viewing user's likely interest in each candidate social endorsement. The system selects a social endorsement and provides it for display to the viewing user with the advertisement. In one embodiment, the selection is based upon the computed affinity scores.

SELECTING SOCIAL ENDORSEMENT INFORMATION FOR AN ADVERTISEMENT FOR DISPLAY TO A VIEWING USER

BACKGROUND

[0001] This invention relates generally to online advertising, and in particular to selecting social endorsement information to provide to a user of a social networking system in conjunction with an online advertisement.

[0002] Online advertising has evolved into a profitable business, allowing commercial and private entities alike to place advertisements on websites and within native applications, and then display the advertisements to viewing users who access the websites and applications. The ability to analyze data associated with a particular website, application, and/or the viewing user has allowed advertisers to provide ads that are more relevant to a viewing user's interests. More relevant ads increase the likelihood of ad conversion (e.g., that the viewing user will observe the ad, click on the ad, proceed to the advertiser's website, or otherwise respond to the ad with the intended result) and/or the likelihood of greater demand for or awareness of the advertiser's goods or services, thereby raising the effectiveness of the ad.

[0003] Ad targeting attempts to increase ad conversion by showing ads that are more relevant to the viewing user's interests. Ads accompanied by social context, such as information about a friend's activities related to the thing being advertised, may further increase the relevance of the ads. . Although providing social context information in conjunction with an advertisement increases the advertisement's effectiveness, for any given individual there may be an abundance of social context information available. Current ad systems lack the ability to select the most relevant and effective social information to provide as a social context, or social endorsement, in conjunction with an ad. Therefore, there is a need for a comprehensive solution to identify candidate social endorsements and select the most relevant and effective to provide as social endorsement information in conjunction with advertisements.

SUMMARY

[0003a] A first aspect of the present disclosure provides a computer-implemented method comprising:

receiving, by a computer, a request to display an advertisement with social endorsement information to a viewing user, wherein the viewing user is a user of a social networking system;

selecting an advertisement in response to the received request;
 identifying, by the computer, one or more objects in the social networking system related to the selected advertisement;
 identifying, by the computer, a plurality of candidate social endorsements associated with the selected advertisement, each candidate social endorsement comprising a description of an associated interaction between an identified object and one or more associated users who are connected to the viewing user in the social networking system;
 selecting, by the computer, a candidate social endorsement from the plurality of candidate social endorsements;
 combining the selected advertisement and the selected candidate social endorsement to create a modified advertisement; and
 providing, by the computer, the modified advertisement and the selected candidate social endorsement for display to the viewing user.

[0003b] A second aspect of the present disclosure provides computer-implemented system for selecting social endorsement information to provide with an advertisement, the system comprising:

a computer processor; and
 a non-transitory computer-readable storage medium storing computer program modules configured to execute on the computer processor, the computer program modules comprising:
 a receiving module configured to receive a request to display an advertisement with social endorsement information to a viewing user, wherein the viewing user is a user of a social networking system;
 a selection module configured to select an advertisement in response to the received request;
 an object identification module configured to identify one or more objects in the social networking system related to the selected advertisement;
 a candidate social endorsement identification module configured to identify a plurality of candidate social endorsements associated with the selected advertisement each comprising a description of an

- associated interaction between an identified object and one or more other users who are connected to the viewing user in the social networking system;
- a selection module configured to select a candidate social endorsement from the plurality of candidate social endorsements;
- a combination module configured to combine the selected advertisement and the selected candidate social endorsement to create a modified advertisement; and
- a providing module configured to provide the modified advertisement and the selected candidate social endorsement for display to the viewing user.

[0004] To address the needs of advertisers to maximize the effectiveness of using social networking system data in providing socially relevant advertising to viewing users, embodiments of the invention select a candidate social endorsement based on a computed affinity score to provide as social endorsement information. In one embodiment, a request is received for social endorsement information to display with an advertisement to a viewing

user, where the viewing user is a user of a social networking system. Objects within the social networking system that are related to the advertisement are identified, and interactions between these objects and social networking system users associated with the viewing user are also identified. Candidate social endorsements thus comprise the identified interaction, the interacting user and the interacted-upon object. Affinity scores may be computed between the viewing user and each candidate social endorsement. A candidate social endorsement is selected for display with the advertisement. This selection may be selected based on the computed affinity scores.

[0005] Embodiments of the invention select a candidate social endorsement to provide as social endorsement information using a variety of methods. In one embodiment, ad tags are used in identifying social networking system objects related to the advertisement.

Alternatively, an advertiser, a third-party publisher, or the social networking system may identify social networking system objects related to the ad. Social networking system objects may comprise social networking system users or user profiles, web pages, content items, events, retailers, locations, or any other social networking system data capable of being interacted with by a social networking system user. In one embodiment, users of the social networking system associated with the viewing user comprise “friends” of the viewing user in the context of the social networking system. Alternatively, these associated users may comprise users that have communicated with the viewing user through the social networking system or users that the social networking system determines are associated with the viewing user outside of the context of the social networking system. In one embodiment, interacting with an object comprises clicking a button expressing endorsement of the object (for instance, a “like” button). In another embodiment, interaction comprises making a purchase, communicating within the social networking system, or joining a social networking system group or fan page. In one embodiment, at least one identified friend has interacted with more than one object, and each interaction comprises a separate candidate social endorsement.

[0006] Affinity scores may be computed based on the relationship between the viewing user and the associated user of each candidate social endorsement. Alternatively, affinity scores may be computed based on the type of interaction, the type of object interacted with, the type of advertisement, and/or the identity of the viewing user. In some embodiments, an affinity score for a particular interaction may decay over time, and the rate of decay may vary depending on the identity of the associated user or the type of object or interaction. Selecting a candidate social endorsement to provide as social endorsement information based on the

affinity score may comprise selecting the candidate social endorsement with the highest affinity score. In another embodiment, selecting a candidate social endorsement comprises selecting based only in part on the affinity score. In yet another embodiment, selecting comprises selecting a candidate social endorsement that doesn't have the highest affinity score.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is a diagram of a process for providing social endorsement information for display with an advertisement, in accordance with one embodiment of the invention.

[0008] FIG. 2 is a high level block diagram illustrating a system environment suitable for selecting social endorsement information for display with an advertisement to a viewing user, in accordance with one embodiment of the invention.

[0009] FIG. 3 is a block diagram illustrating a process for selecting social endorsement information from one or more candidate social endorsements for display with an advertisement, according to one embodiment of the invention.

[0010] FIG. 4 is a block diagram of a process for selecting social endorsement information for a particular example, according to one embodiment of the invention.

[0011] FIG. 5 is a flow chart of a process for selecting social endorsement information for display with an advertisement, in accordance with one embodiment of the invention.

[0012] The figures depict various embodiments of the present invention for purposes of illustration only. One skilled in the art will readily recognize from the following discussion that alternative embodiments of the structures and methods illustrated herein may be employed without departing from the principles of the invention described herein.

DETAILED DESCRIPTION

Overview

[0013] Online social networking systems comprise one or more computing devices storing a social network, or a social graph, comprising a plurality of users and providing users of the social networking system with the ability to communicate and interact with other users of the social networking system. Social networking systems allow users to explicitly associate themselves and establish connections with other users of the social networking system. When two users become connected, they are said to be "friends," "contacts," "connections," or "associates" within the context of the social networking system. Alternatively, connections may be automatically created by the social networking system based on common characteristics of the users (for example, users who have had a common

employer, have a common friend, or like a common film). Generally being connected in a social networking system allows connected users access to more information about each other than would otherwise be available to unconnected users. Likewise, becoming connected within a social networking system may allow a user greater access to communicate with another user, such as by email (internal and external to the social networking system), instant message, text message, phone, or any other communicative interface. Finally, being connected may allow a user access to view, comment on, download or endorse another user's uploaded content items. Examples of content items include but are not limited to messages, queued messages (e.g., email), text and SMS (short message service) messages, comment messages, messages sent using any other suitable messaging technique, an HTTP link, HTML files, images, videos, audio clips, documents, document edits, calendar entries or events, other user-generated content, and other computer-related files.

[0014] Online social networking systems may track objects through the use of a social graph, which includes a plurality of nodes that are interconnected by a plurality of edges. In the social graph, nodes represent objects within the context of the social networking system. Common examples of objects include users, content items, groups, web pages, fan pages, events, messages, concepts, interactions, information, activities, data, computer applications, advertisements or any other entity capable of being represented in a social networking system. Companies, locations, venues, merchants, bands, non-user persons, restaurants, or any other entities may be directly represented by a social networking system object, or may be indirectly represented by an object via a group, web page or fan page within the social networking system dedicated to the entity. For instance, the restaurant "Refuge" or the venue "Orpheum Theatre" may have dedicated objects within the social networking system; alternatively, Refuge may have a fan page and the Orpheum Theatre may have a web page on the social networking system.

[0015] An edge between nodes in the social graph represents a particular kind of connection between the two nodes, which may result from an interaction that occurred between the nodes. For instance, for two nodes that represent users, an edge may imply that the users are friends within the context of the social networking system. Alternatively, an edge may imply that the users have communicated with each other, that one user may have viewed the other's profile, that the users attended the same high school, or any other means of connection or interaction. For two nodes where at least one node does not represent a user, an edge may imply similar or different connections or interactions. For example, an

edge may indicate a user clicked the “like” button for a group dedicated to a particular band, or that a user clicked on an advertisement. Alternatively, an edge may indicate that two companies, each represented by a social networking system web page, are associated with each other despite no explicit action by either company.

[0016] When a new object of a particular type is created, the social networking system may initialize a new node of the corresponding type, may assign a unique object or node identifier to it, and may begin to add data to the object as needed. This might occur, for example, when an individual first becomes a user of the social networking system, when the social networking system generates a new user profile, when a user starts a new group, when a new content item is uploaded to the social networking system, or any other time an object is added to or created within the social networking system. When a new object is created, an edge may be created linking the object node to the node representing the user who created the object. In addition, the social networking system may link the new object node or any existing nodes to other social graph nodes automatically. For instance, if a first user uploads a photograph of a sports bar to the social networking system, and afterwards, a fan page for the sports bar is created, the social networking system may provide an edge between the user node and the fan page node without explicit action by a user. Further, if a second user posts a comment about going to the sports bar on a third user’s profile, the second user’s and third user’s nodes may be automatically connected to the sports bar node without explicit action by either user in regards to the sports bar node.

[0017] Users of social networking systems may interact with social networking system objects in a variety of forms, such as by communicating with or commenting on a content item, information or action; clicking a button or link associated with approval (such as a “like” button or the equivalent); sharing a content item, user information or user actions with other users; or downloading or merely viewing a content item. Interaction may also comprise using a computer-based application within the context of the social networking system (such as a video game only accessible and playable from within the social networking system), or an application external to the social networking system (such as a desk top web browser or mobile application) that may or may not interface with the social networking system. Further, interactions also include making a purchase, either in the context of the social networking system, or external to the social networking system; joining, commenting on or subscribing to a social networking system group, web page or fan page; using a mobile device to transmit a current or past location to the social networking system (“checking in” to

a location); scheduling a meeting, gathering, errand, vacation, task, objective, reservation, date or any other event or calendar entry; and accepting an invitation to or indicating the intent to attend a meeting, gathering, party, concert, play or any other event. For instance, a user may join a group dedicated to Chopin, may buy tickets to a Chopin performance, may check into the concert hall when the user arrives at the performance, and may post a note to the user's profile reviewing the performance, all of which constitute interactions.

[0018] Users of social networking systems may also interact with other users by associating with, connecting to or becoming friends with them, by viewing their profile, by communicating with them, or by having common friends within the social networking system. In addition, a social networking system user may interact with content items, websites, other users or other information outside of the context of the social networking system's web pages that are connected to or associated with the social networking system. For instance, an article on a news web site might have a "like" button that users of the social networking system can click on to express approval of the article. Likewise, a company's website may provide the ability to join a social networking system group dedicated to the company directly from the company's website. These interactions and any other suitable actions within the context of a social networking system may be recorded in social networking system data, which can be used to generate social endorsement information. The social endorsement information may comprise text, images, links, and/or be of any suitable form necessary to convey social endorsement information to a user.

[0019] Social endorsement information may be used to provide social context for advertisements that are shown to a particular viewing user. FIG. 1 is a diagram of a process for providing social endorsement information for display with an advertisement, in accordance with one embodiment of the invention. As illustrated, social networking system user data store 100 provides user data and social networking system object data store 105 provides object data to the affinity/selection module 120. In addition, social networking system interaction data store 110 provides interaction data correlated to the provided user data and object data to the affinity/selection module 120. The ad store 130 provides an ad 135 in conjunction with social endorsement information 125 from the affinity selection module 120 to the ad/endorsement combination module 140. The ad/endorsement combination module 140 transmits the ad 135 and social endorsement 145 to the third-party publisher 150 for display to viewing user 160.

[0020] User data store 100 stores user information, user account information, user profiles and profile information, user connections, and other user-related data. For instance, user data store 100 may store the identity of a user, the user's account settings, and the social networking system friends of the user. In addition, user data store 100 may store profile information such as biographic, demographic and other types of descriptive information (work experience, educational history, hobbies or preferences, interests, location, and the like). Object data store 105 stores any information relating to objects. This includes descriptive information visible to social networking system users, such as user profile, group profile and fan page profile information; message board contents; user-generated content (such as comments, uploaded photographs and videos, and profile messages); event information; and any other information accessible to social networking system users. In addition, object data store 105 may store object data hidden to users, such as meta-tags, object keywords, category information, search indexes, and any other data accessible to the social networking system but not viewable to social networking system users. Interaction data store 110 stores data about user activities within the social networking system. This includes specific interactions as discussed above, as well as activity levels and usage statistics. Whenever a user interacts with an object, an edge between the user node and the object node may be created in the social graph; this edge may be stored in interaction data store 110. Interaction data store 110 includes information about a particular interaction and may include information about the user node and the object node associated with the interaction. In one embodiment, the interaction data store 110 uses the social graph to identify the object node and the user node associated with an interaction.

[0021] In one embodiment, ad 135 is a web-based ad which is displayed in the margins or other dedicated area of a website. In another embodiment, ad 135 is displayed within a software application, video game or a mobile device application. The ad 135 may have a dedicated space within the ad 135 to display social endorsement information 125, referred to as the social endorsement information footprint. Alternatively, the third-party publisher 150 may modify the ad 135 or the area where the ad 135 is to be displayed (referred to as the ad footprint) in order to accommodate the social endorsement information 125. In some embodiments, the ad 135 and the social endorsement information 125 are combined prior to being transmitted to the third-party publisher; in other embodiments, the ad 135 and social endorsement information 125 are transmitted individually and may be combined by the third-party publisher.

[0022] These embodiments describing serving social endorsement information are merely meant to be exemplary, and are not intended to be restrictive. In other embodiments, there are more or fewer components performing the same or substantially similar functions as the components of the embodiment of FIG. 1. For instance, the user data store 100, the object data store 105, and the interaction data store 110 may all comprise the same storage entity. In addition, as will be discussed below, in some embodiments, the functionality of the affinity/selection module may be provided by the social networking system; in other embodiments, all or part of this functionality may be provided external to the social networking system. Further examples of providing social endorsement information are found in U.S. Patent Application No. 12/898,662, which is hereby incorporated by reference.

System Architecture

[0023] FIG. 2 is a high level block diagram illustrating a system environment suitable for selecting social endorsement information for display with an advertisement to a viewing user, in accordance with one embodiment of the invention. The system environment comprises a viewing user 210, the viewing user 210 being a member of a social networking system 220, an ad server 230, and an advertiser 240, all of which communicate through a connecting network 200. The connecting network may be the Internet, a local area network, a wireless network or any other network that allows communication between modules. The connecting network 200 may use standard communications technologies and/or protocols. In alternative configurations, different and/or additional modules can be included in the system.

[0024] The viewing user 210 may access the connecting network 200 through a website that can display an advertisement, which may comprise one or more web pages, and may be hosted on a web server. Alternatively, the viewing user 210 may access the connecting network 200 via a native application. In such instances, the viewing user 210 may use a computer, a laptop, a netbook, a tablet computer or a mobile device, or any other suitable device which can display an advertisement within a native application running on the device to access the connecting network 200. The ad displayed to the viewing user 210 may comprise text, images, video, audio, or any other ad-related content. The ad may be static, animated, interactive, transparent, mobile, stationary, displayed outside the initial viewing area of a website or application, or in the case of a website, when the website is initially accessed, the ad may constitute its own web page altogether that is displayed when accessing the website. The ad may be displayed by a third-party publisher, which may publish the ad in a website, a mobile application, or any other medium.

[0025] The social networking system 220 may comprise a plurality of web pages hosted on one or more web servers. The plurality of web pages may present social networking system information. As discussed above, these pages may include pages for user profiles, group profiles, fan pages, and other social networking system-related pages. These pages may include a variety of social networking system data, such as personal information, user information, user actions, group information, fan page information, endorsement information, content items, user settings, group settings, search results, ads, ad tags, and any other social networking system-related data. The social networking system data is stored in one or more social networking system databases. These databases and all other social networking system components can communicate with the viewing user 210, the ad server 230, the advertiser 240 or any other module through the connecting network 200 via the social networking system web servers. The databases may provide social networking system user data, object data, interaction data or any other social networking system data when by requested another module.

[0026] The ad server 230 comprises at least one or more web servers coupled to one or more databases. The databases store a plurality of ads, which may be web-based, specifically tailored for display in an application or on a mobile device, or any other type of advertisement. In addition, the ad server 230 may store a plurality of ad tags, which comprise information that may be coupled to the ad that may identify or otherwise describe the subject matter of the ad, the genre of the ad, the product or service represented by the ad, or any other characteristic, feature or property of the ad. In some embodiments, the ad tags identify specific social networking system objects which may be related to the ad. In one embodiment, the advertiser selects the ad tags; alternatively, the social networking system or any third party may select the ad tags. The ads may be received from advertiser 240 or any other entity capable of providing for delivery by the ad server 230. The ad server's web servers can receive ads for storage and can serve ads from the databases to any module which requests ads. In some instances, the ad server 230 and the advertiser 240 are the same entity. In some instances, the ads and associated ad tags may come from different sources. The ad server 230 may serve an ad with an accompanying one or more ad tags, or the ad server 230 may serve an ad without an accompanying ad tag. The ad server 230, in response to receiving a request for an ad, may in turn request an ad from the advertiser 240; likewise, the ad server 230 may request ad tags from the advertiser 240 or any other module.

[0027] The advertiser 240 comprises at least one or more web servers coupled to one or more databases. The databases may store ads to be delivered to the ad server 230 or any other module, and may store ad tags for stored ads or any other ad. The advertiser 240 may generate ad tags for an ad prior to serving the ad to the ad server 230 or any other module. Alternatively, the advertiser 240 may generate ad tags after the ad has been served, for instance in response to a request for an ad tag by the ad server 230 or any other module. Alternatively, instead of ad tags, the ad server 230, the advertiser 240, or any other entity may simply specify which objects in the social networking system the ad is related to for the purposes of this invention. In such an embodiment, the ad server 230, advertiser 240, or other entity may communicate this information directly to the social networking system 220, or may do so through an intermediary. In one embodiment, the objects related to the ad are selected based on the identity of the viewing user 210. In one embodiment, the social networking system 220 determines which objects are related to the ad; this may occur before or after the social networking system 220 receives the ad, learns the identity of the ad, or scans the ad for content. In various embodiments, there are more or fewer components performing the same or substantially similar functions as the components of the embodiment of FIG. 2.

Operation

[0028] FIG. 3 is a block diagram illustrating a process for selecting social endorsement information from one or more candidate social endorsements for display with an advertisement, according to one embodiment of the invention. Social endorsement information 370 may be selected in response to a request for social endorsement information 370. In one embodiment, this request comes from an ad 300 itself. For instance, the ad 300 may have executable code embedded within the ad 300 that when executed, transmits a request for social endorsement information 370 to the social networking system 220 or other entity. In some embodiments, the third-party publisher displaying the ad 300 requests the social endorsement information 370. In some embodiments, the viewing user 210 transmits the user's identity to the ad 300 or the third-party publisher displaying the ad 300. The viewing user 210 may be identified to the ad 300 or third-party publisher either prior to or after the request for social endorsement information 370. In some embodiments, the viewing user 210 is not identified by the ad 300 or the third-party publisher; instead, the viewing user 210 may transmit the user's identity to the social networking system 220, either at the request of the ad 300, the third-party publisher, the social networking system 220, or any third-party

entity. The viewing user 210 may identify himself in many ways, such as via an IP address, a cookie storing the user's identity, an interface with the social networking system 220 which allows the ad 300 or third-party publisher to receive the user's identity from the social networking system 220 when the viewing user 210 is signed into the social networking system 220, or any other suitable means of identification.

[0029] Social networking system interactions 340 between objects 320 related to the ad 300 and users 330 associated with the viewing user 210 are identified. In one embodiment, this comprises first identifying social networking system objects 320 related to the ad 300, and then subsequently identifying social networking system users 330 who are associated with the viewing user 210. In an alternative embodiment, users 330 associated with the viewing user 210 are first identified, and objects 320 related to the ad 300 are subsequently identified. In yet another embodiment, objects 320 related to the ad 300 and users 330 associated with the viewing user 210 are concurrently identified. When objects 320 related to the ad 300 and users 330 associated with the viewing user 210 are identified, interactions 340 between the users 330 and the objects 320 may be identified. Alternatively, in one embodiment, only users 330 related to the viewing user 210 that have interacted with objects 320 are identified. Any method or order of identifying one or more interactions 340 between one or more objects 320 related to ad 300 and one or more users 330 associated with the viewing user 210 may be used.

[0030] Social networking system objects 320 related to the ad 300 may be identified in a variety of ways. In one embodiment, the ad 300 contains ad tags. These ad tags may identify particular objects with the social networking system 220. For instance, an ad tag may identify a fan page for a particular punk band by the URL for the fan page, a social networking system index number for the fan page, key words which the social networking system 220 analyzes to identify the fan page, or any other method suitable for identifying an object within the social networking system 220 by the contents of an ad tag. Alternatively, the ad server 230, advertiser 240 or any other entity may identify objects 320 in the social networking system 220 related to the ad 300. This identification may occur separately or in conjunction with the transmission of the ad 300, and may involve communication between the ad server 230, the advertiser 240, a third party publisher or any other entity and the social networking system 220. For example, the advertiser 240 may provide an ad 300 for a shoe sale to a third-party publisher, and may communicate to the social networking system 220 the URL of the social networking system web page for the company that makes the shoe, the

brand of shoe associated with the sale (which the social networking system 220 can use to identify a group dedicated to the shoe brand), and a store near the user 220 which sells the shoe (which the social networking system 220 can use to identify communications made about the store).

[0031] In the event that the ad server 230, the advertiser 240, a third-party publisher or any other entity fails to provide information or data (such as ad tags or the like) which the social networking system 220 can use to identify objects 320 in the social networking system 220 related to the ad 300, the social networking system 220 can identify related objects 320 with various other means. In one embodiment, the identity of the ad 300 itself is provided to the social networking system 220. In such instances, the social networking system 220 may identify objects 320 related to the ad in a pre-designated index which correlates ads to objects related to the ads. This pre-designated index may be populated by advertisers or any other party. In one embodiment, if the identity of the ad 300 is provided, the social networking system 220 determines which objects have been identified previously as related to the ad 300, and uses this as a basis for identifying objects 320 related to the ad 300.

[0032] In an embodiment where the ad 300 itself is provided to the social networking system 220 (instead of ad tags or other identifying information), the social networking system 220 may scan or analyze the ad 300 to identify characteristics, properties, objects or any other identifying features of the ad 300; this may involving scanning the text of the ad 300, identifying images in the ad 300, searching the internet for websites displaying the ad 300 and scanning or parsing the contents of these websites, or any other method of identifying the contents or components of the ad 300 or social networking system objects related to the ad 300. In this embodiment, once the characteristics, properties and features of the ad 300 are determined, the social networking system 220 may identify objects 320 related to the ad 300 using any means necessary. For example, if an ad 300 is received, the social networking system 220 may scan the ad 300 and discover that it contains the phrases “DVD” and “Phil’s Movie Store” and an image of the “The Godfather” movie poster. In addition, the social networking system 220 may search the Internet for the ad 300 and may discover that it was displayed on a popular website dedicated to the movies. The social networking system 220 may then identify a social networking system event for a DVD sale at Phil’s Movie Store, the fan page for the popular website, and the concept “The Godfather” (for instance, this concept may comprise a node in the social networking system 220 that users who list The Godfather as a favorite movie would be connected to) as objects 320 related to the ad 300. These

examples are merely illustrative; any suitable means of identifying objects 320 related to the ad 300 may be used.

[0033] Social networking system users 330 who are associated with the viewing user 210 may be identified. In one embodiment, this comprises identifying all social networking system users who are “friends” with the viewing user 210 in the context of the social networking system 220. In another embodiment, only a subset of the friends of the viewing user 210 are identified; this subset may be a group defined by one or more particular characteristics (such as relatives of the viewing user 210), may be selected by other criteria, or may be randomly selected. In an alternative embodiment, social networking system users 330 are identified that are not explicitly friends with the viewing user 210, but instead are associated with the viewing user 210 in another way. For instance, users 330 may be identified based on a common friend with the viewing user 210, based on common user profile information (the same favorite movie, attended the same high school, etc.), based on membership in the same network, based on demographic data (e.g., the same geographic location), or based on any trait, characteristic, information, feature or property. In one embodiment, the social networking system 220 uses a social graph to determine which users 330 are connected to the viewing user 210; in such instances, the social networking system 220 may identify users 330 whose nodes are connected with the viewing user’s node by an edge. In one embodiment, only users 330 associated with the viewing user 210 who have interacted with one or more identified objects 320 are identified. Any suitable method of identifying users 330 either associated with viewing user 210 or having interacted with objects 320 may be used.

[0034] Interactions 340 between users 330 and objects 320 are identified. As mentioned above, interactions 340 may take several forms; for example, if a user associated with the viewing user 210 joined a group that was related to ad 300, this interaction 340 may be identified. Likewise, an interaction 340 may exist between an object 320 and a user 330, but the interaction 340 may not be identified. In one embodiment, a single user 330 associated with viewing user 210 may interact with two or more objects 320 related to ad 300; none, one, two or more of these interactions 340 may be identified. In another embodiment, an identified user 330 may not have interacted with any object 320. Likewise, an object 320 may not have been interacted with by any user 330. The interaction 340 may occur outside of the context of the social networking system 220; in such instances, the interaction 340 may be communicated to the social networking system 220.

[0035] Interactions 340 may be identified in various ways. In one embodiment, every interaction 340 between objects 320 and users 330 is identified. In another embodiment, only certain interactions 340 are identified. Interactions 340 may be identified based on the interaction type, the objects 320 interacted with, the interacting users 330, the identity of the viewing user 210, the ad 300, or any other characteristic, property or feature necessary to suitably identify interactions 340. For instance, in one embodiment, only interactions 340 comprising purchasing products or services may be identified. Likewise, in one embodiment, only interactions 340 between users 330 who are relatives of viewing user 210 and objects 320 that are fan pages may be identified. For a single user 330 who has interacted with more than one object 320, only one, more than one, or none of these interactions 340 may be identified. For instance, in one embodiment, if the user 330 purchased a car and joined a social networking system group dedicated to the model of car, the car purchase may be the only interaction identified or vice versa.

[0036] In one embodiment, one or more identified interactions are associated with the correlated interacting user 330 and the interacted upon object 320 to create one or more candidate social endorsements 350. Accordingly, each of these one or more candidate social endorsements 350 comprise information describing a social networking system interaction 340 between a user 330 associated with the viewing user 210 and an object 320 related to the ad 300. Thus, in one embodiment, each candidate social endorsement 350 could be used as social endorsement information 370.

[0037] An affinity score may be computed for each candidate social endorsement 350 between the candidate social endorsement 350 and the viewing user 210. In one embodiment, the affinity score is computed by an affinity/selection module 360. In one embodiment, the affinity/selection module 360 comprises two separate and distinct modules. All or part of the affinity/selection module 360 functionality may be implemented within or external to the social networking system 220. The affinity score may be computed to represent the anticipated likelihood that the viewing user 210 will click on the ad 300, the relevance of the ad 300 or candidate social endorsement 350 to the viewing user, or any other quantifiable measure related to the viewing user 210, the ad 300, the social endorsement information 370 or any other entity, property, characteristic, value, information, data or concept. In one embodiment, affinity scores are not calculated for candidate social endorsements, wherein the candidate social endorsement is selected using other criteria.

[0038] Affinity scores may be computed based on the type of interaction 340 represented by each candidate social endorsement 350. For example, the affinity score for a candidate social endorsement 350 representing a purchase of a book may be greater than an affinity score for a candidate social endorsement 350 representing the posting of a review of the book, which in turn may be greater than an affinity score for a candidate social endorsement 350 representing the clicking of the “like” button for the object representing the book. Affinity scores may also be computed based on the object 320 or user 330 represented by each candidate social endorsement 350. For example, fan pages may be weighed higher than user-uploaded pictures, and relatives of the viewing user 210 may be weighed higher than elementary school classmates. Affinity scores may be computed based on the type of advertisement 300; for instance, candidate social endorsements 350 representing purchases may have higher affinity scores than other candidate social endorsements 350 when the ad 300 involves a sale at a shoe store. Affinity scores may be computed based on any component, module, entity, information, user, characteristic, property, value, data or concept. Affinity scores may represent any kind of measure of a viewing user’s possible interest in anything related to the social endorsement, whether based on historical information or any other prediction or measurement means.

[0039] Affinity scores may be pre-designated for particular candidate social endorsements 350, particular viewing users 210, or particular ads 300. In addition, affinity scores may be computed according to pre-designated formulas or equations. Alternatively, affinity scores may be computed dynamically, depending on the viewing user 210, ad 300, candidate social endorsement 350, or any other property, value, entity, information, characteristic or data. Affinity scores may be computed based on multiple factors or a single factor. Affinity scores may also decay over time. In one embodiment, an affinity score may be computed based on several factors, one or more of which may decay over time and one or more of which may not decay over time. The rates of decay for affinity scores may depend on the type of interaction 340, type of object 320 or identity of the user 330. For example, the rate of decay for posting a message to fan page profile may be faster than the rate of decay for planning a party at a particular night club using a social networking system’s calendar function.

[0040] The affinity/selection module 360 selects a candidate social endorsement 350 to provide as social endorsement information 370. In one embodiment, this selection is based on the candidate social endorsement affinity scores. The candidate social endorsement 350

with the highest affinity score may be selected. In another embodiment, a candidate social endorsement 350 may be selected based only in part on the affinity score. In yet another embodiment, a candidate social endorsement 350 may be selected based on the rate of decay of the affinity score. Any suitable method of selecting a candidate social endorsement 350 based on affinity scores to provide as social endorsement information 370 may be used. Alternatively, a candidate social endorsement 350 may be selected without consideration to affinity scores. In one embodiment, affinity scores are not calculated, and a candidate social endorsement 350 is selected based upon other criteria. In one embodiment, multiple candidate social endorsements may be selected and used as social endorsement information 370. Alternatively, multiple candidate social endorsements may be aggregated and displayed as social endorsement information 370. In one embodiment, the social endorsement information 370 is displayed in a social endorsement footprint 310 within the ad 300. In another embodiment, the social endorsement information 370 is displayed external to an ad 300. In yet another embodiment, a third-party publisher adjusts the dimensions or format of the ad 300 in order to display the social endorsement information 370.

[0041] FIG. 4 is a block diagram of a process for selecting social endorsement information for a particular example, according to one embodiment of the invention. In this example, the ad 300 is an ad advertising a concert 400. The concert ad 400 comprises a social endorsement information footprint 410 and ad tags 420. The ad tags 420 identify objects 320 in the social networking system 220; in particular, the objects 320 identified are the band performing the concert, the ticket seller for the concert, an album produced by the band, the venue of the concert, and a fan page dedicated to the concert.

[0042] The viewing user 210 in this example is Tom 430. Tom is identified to the social networking system 220, and users 330 of the social networking system 220 associated with Tom are identified. These users 330 are girlfriend Rachel, brother Steve, friend Jason, teacher Claire, and co-worker Bebe, the first four of which are “friends” with Tom in the context of the social networking system, and the fifth (Bebe) is automatically determined by the social networking system 220 because both Bebe and Tom list their employer in their profile. Interactions between the objects 320 and the users 330 are identified; in this example, there are five such interactions. Rachel clicked 440 the like button on the web page dedicated to the band. Steve bought 442 the album by the band and posted 448 a message to the concert fan page. Claire also bought 444 the album, and Bebe recently checked 446 into the venue using a mobile device, but for a different concert. Note that Jason did not interact

with any of the objects 320 related to the concert ad 400, and none of the users 330 interacted with the ticket seller object.

[0043] These five interactions comprise candidate social endorsements 350. The affinity/selection module 470 of this example computes an affinity score for each of the candidate social endorsements 350. In this example, affinity scores are computed primarily based on the strength and type of the relationship between the user 330 in the interaction 340 of the candidate social endorsement 350 and the viewing user 210, giving the highest affinity score to the candidate social endorsement 350 comprising Rachel clicking 440 the like button on the band's social networking system web page. Further, in this example, the candidate social endorsement 350 with the highest affinity score is selected and provided as social endorsement information 370; thus social endorsement information comprising "Rachel likes band" 470 is provided to the concert ad 400. It should be noted that this example is merely intended to be illustrative, and is not intended to be restrictive in any way.

[0044] FIG. 5 is a flow chart of a process for selecting social endorsement information for display with an advertisement, in accordance with one embodiment of the invention. First, a request for social endorsement information 370 for display with an advertisement 300 to a viewing user 210 is received 500. Next, social networking system objects 320 related to the ad 300 are identified 505. Interactions 340 between the identified objects 320 and social networking system users 330 associated with the viewing user 210 are identified 510. Candidate social endorsements 350 are created by associating 515 one or more of the identified interactions 340 with the interacting users 330 and the interacted-upon objects 320. Affinity scores are computed 520 for each candidate social endorsement 350, representing the affinity between the candidate social endorsement 350 and the viewing user 210. Finally, a candidate social endorsement 350 is selected 525 to provide as social endorsement information 370 based at least in part on the computed affinity scores for the candidate social endorsement 350.

Summary

[0045] The foregoing description of the embodiments of the invention has been presented for the purpose of illustration; it is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Persons skilled in the relevant art can appreciate that many modifications and variations are possible in light of the above disclosure.

[0046] Some portions of this description describe the embodiments of the invention in terms of algorithms and symbolic representations of operations on information. These

algorithmic descriptions and representations are commonly used by those skilled in the data processing arts to convey the substance of their work effectively to others skilled in the art. These operations, while described functionally, computationally, or logically, are understood to be implemented by computer programs or equivalent electrical circuits, microcode, or the like. Furthermore, it has also proven convenient at times, to refer to these arrangements of operations as modules, without loss of generality. The described operations and their associated modules may be embodied in software, firmware, hardware, or any combinations thereof.

[0047] Any of the steps, operations, or processes described herein may be performed or implemented with one or more hardware or software modules, alone or in combination with other devices. In one embodiment, a software module is implemented with a computer program product comprising a computer-readable medium containing computer program code, which can be executed by a computer processor for performing any or all of the steps, operations, or processes described.

[0048] Embodiments of the invention may also relate to an apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, and/or it may comprise a general-purpose computing device selectively activated or reconfigured by a computer program stored in the computer. Such a computer program may be stored in a non-transitory, tangible computer readable storage medium, or any type of media suitable for storing electronic instructions, which may be coupled to a computer system bus. Furthermore, any computing systems referred to in the specification may include a single processor or may be architectures employing multiple processor designs for increased computing capability.

[0049] Embodiments of the invention may also relate to a product that is produced by a computing process described herein. Such a product may comprise information resulting from a computing process, where the information is stored on a non-transitory, tangible computer readable storage medium and may include any embodiment of a computer program product or other data combination described herein.

[0050] Finally, the language used in the specification has been principally selected for readability and instructional purposes, and it may not have been selected to delineate or circumscribe the inventive subject matter. It is therefore intended that the scope of the invention be limited not by this detailed description, but rather by any claims that issue on an application based hereon. Accordingly, the disclosure of the embodiments of the invention is

intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the following claims.

The claims defining the invention are as follows:

1. A computer-implemented method comprising:
receiving, by a computer, a request to display an advertisement with social endorsement information to a viewing user, wherein the viewing user is a user of a social networking system;
selecting an advertisement in response to the received request;
identifying, by the computer, one or more objects in the social networking system related to the selected advertisement;
identifying, by the computer, a plurality of candidate social endorsements associated with the selected advertisement, each candidate social endorsement comprising a description of an associated interaction between an identified object and one or more associated users who are connected to the viewing user in the social networking system;
selecting, by the computer, a candidate social endorsement from the plurality of candidate social endorsements;
combining the selected advertisement and the selected candidate social endorsement to create a modified advertisement; and
providing, by the computer, the modified advertisement and the selected candidate social endorsement for display to the viewing user.
2. The computer-implemented method of claim 1, further comprising:
computing an affinity score for each candidate social endorsement representing a measure of the affinity between the viewing user and the one or more users associated with the candidate social endorsement.
3. The computer-implemented method of claim 2, wherein the candidate social endorsement is selected based on the computed affinity scores.
4. The computer-implemented method of any one of claims 1 to 3, wherein identifying one or more objects in the social networking system related to the selected advertisement comprises receiving in connection with the selected advertisement information explicitly identifying the identified objects.
5. The computer-implemented method of any one of claims 1 to 3, wherein identifying one or more objects in the social networking system related to the selected

advertisement comprises analyzing the selected advertisement to identify objects related to the selected advertisement.

6. The computer-implemented method of claim 5, wherein analyzing the selected advertisement comprises parsing the selected advertisement for textual terms related to one or more of the identified objects.

7. The computer-implemented method of claim 5, wherein analyzing the selected advertisement comprises receiving ad tags in connection with the selected advertisement, the ad tags comprising information that identify one or more of the identified objects.

8. The computer-implemented method of claim 5, wherein analyzing the selected advertisement comprises identifying a web page associated with the selected advertisement and parsing the web page for textual terms related to one or more of the identified objects.

9. The computer-implemented method of claim 5, wherein analyzing the advertisement comprises identifying a web page associated with the selected advertisement, where one or more of the identified objects are associated with the web page.

10. The computer-implemented method of any one of claims 1 to 9, wherein at least one interaction comprises a purchase associated with one of the identified objects by one of the associated users.

11. The computer-implemented method of any one of claims 1 to 10, wherein at least one interaction comprises an indication of an affiliation with an identified object by one of the associated users.

12. The computer-implemented method of any one of claims 1 to 11, wherein at least one interaction comprises checking in at a location by one of the associated users, where the location is an identified object.

13. The computer-implemented method of any one of claims 1 to 12, wherein at least one interaction occurs on a website external to the social networking system.

14. The computer-implemented method of any one of claims 1 to 13, wherein at least one interaction occurs outside of the social networking system.

15. The computer-implemented method of claim 2, wherein one or more of the computed affinity scores for the candidate social endorsements are computed based on the interactions associated with the candidate social endorsements.

16. The computer-implemented method of claim 2, wherein one or more of the computed affinity scores for the candidate social endorsements are computed based on the identified objects associated with the candidate social endorsements.

17. The computer-implemented method of claim 2, wherein one or more of the computed affinity scores for the candidate social endorsements are computed based on the associated users associated with the candidate social endorsements.

18. The computer-implemented method of claim 2, wherein one or more of the computed affinity scores for the candidate social endorsements are computed based on a decay factor.

19. The computer-implemented method of claim 18, wherein a rate of the decay factor is based on a type of action associated with an associated interaction.

20. The computer-implemented method of claim 18, wherein a rate of the decay factor is based on the identified objects associated with the associated interactions.

21. The computer-implemented method of claim 18, wherein a rate of the decay factor is based on the other users associated with the associated interactions.

22. The computer-implemented method of any one of claims 1 to 21, wherein the identified objects are selected based on the identity of the viewing user.

23. The computer-implemented method of claim 2, wherein the affinity scores are computed based on an anticipated likelihood that the viewing user will select the displayed advertisement.

24. The computer-implemented method of any one of claims 1 to 23, further comprising:

selecting, by the computer, a second candidate social endorsement from the plurality of candidate social endorsements;

aggregating the selected candidate social endorsement and the second selected candidate social endorsement to form an aggregated candidate social

endorsement; and providing, by the computer, the advertisement and the aggregated candidate social endorsement for display to the viewing user.

25. A computer-implemented system for selecting social endorsement information to provide with an advertisement, the system comprising:

a computer processor; and

a non-transitory computer-readable storage medium storing computer program modules configured to execute on the computer processor, the computer program modules comprising:

a receiving module configured to receive a request to display an advertisement with social endorsement information to a viewing user, wherein the viewing user is a user of a social networking system;

a selection module configured to select an advertisement in response to the received request;

an object identification module configured to identify one or more objects in the social networking system related to the selected advertisement;

a candidate social endorsement identification module configured to identify a plurality of candidate social endorsements associated with the selected advertisement each comprising a description of an associated interaction between an identified object and one or more other users who are connected to the viewing user in the social networking system;

a selection module configured to select a candidate social endorsement from the plurality of candidate social endorsements;

a combination module configured to combine the selected advertisement and the selected candidate social endorsement to create a modified advertisement; and

a providing module configured to provide the modified advertisement and the selected candidate social endorsement for display to the viewing user.

Facebook, Inc.

By Patent Attorneys for the Applicant



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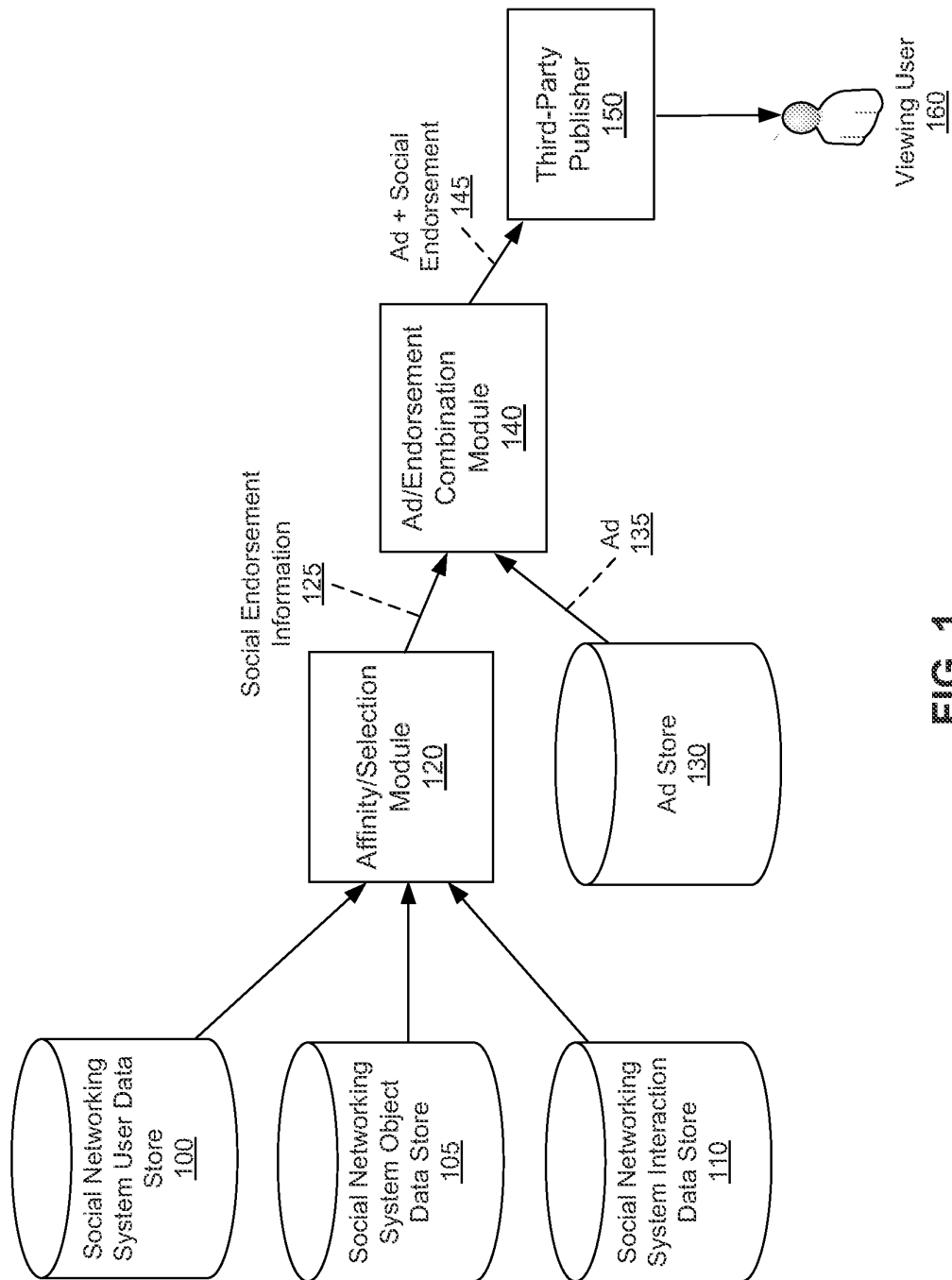
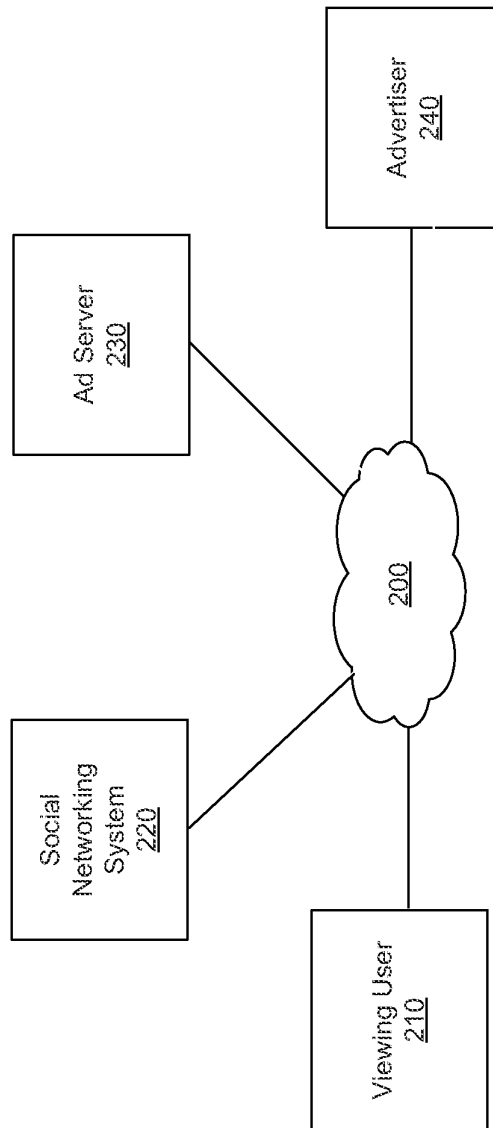
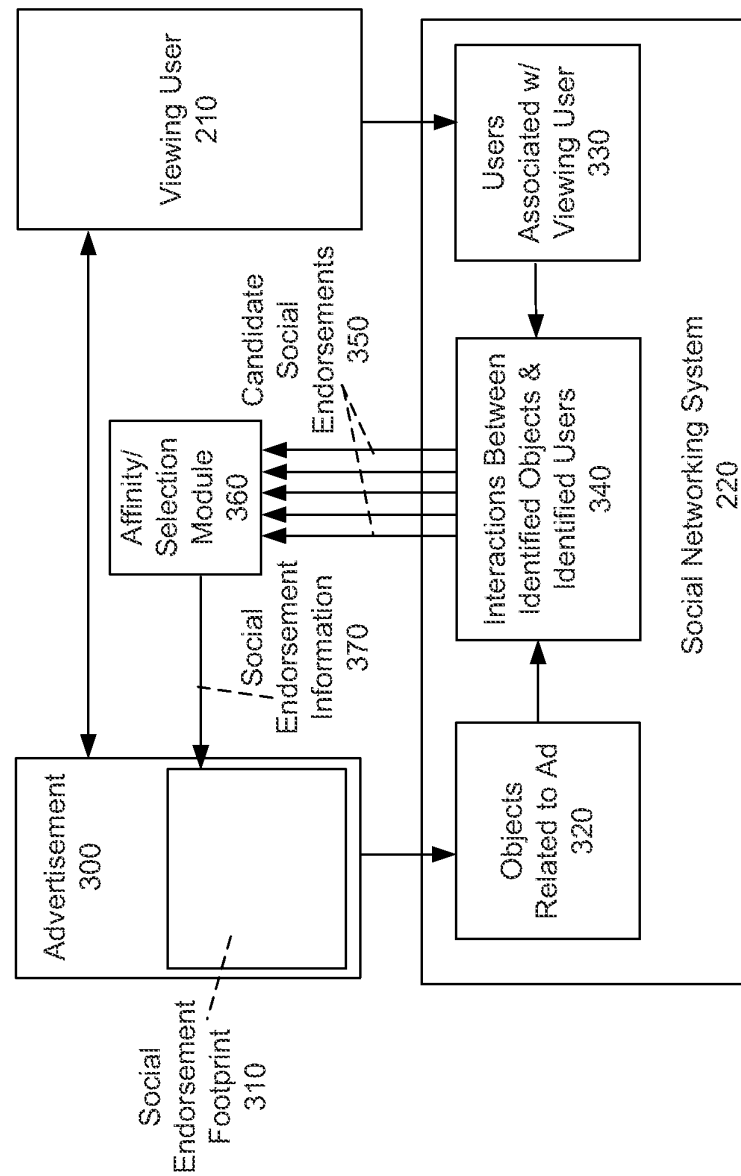


FIG. 1

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**FIG. 2**

**FIG. 3**

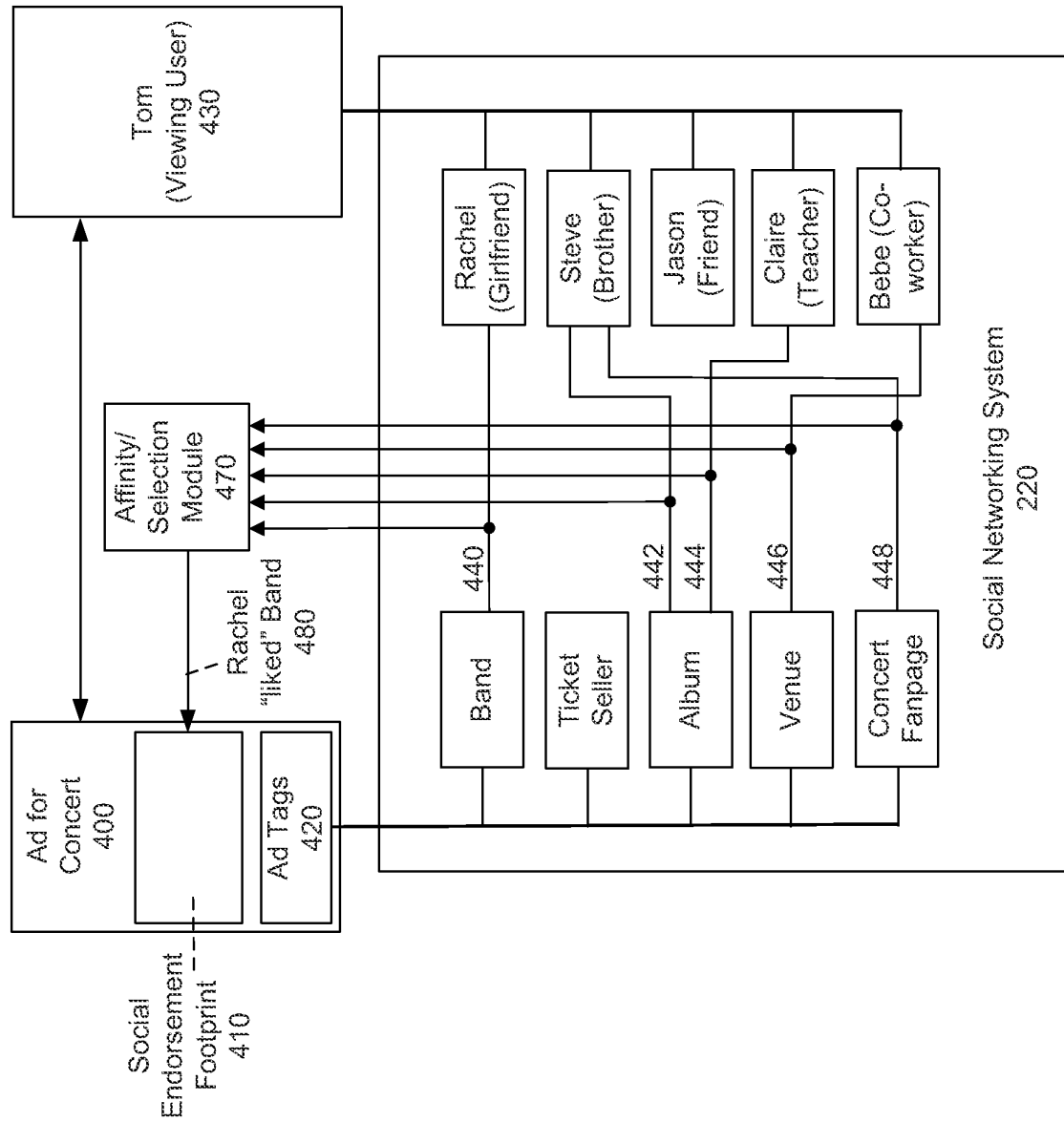
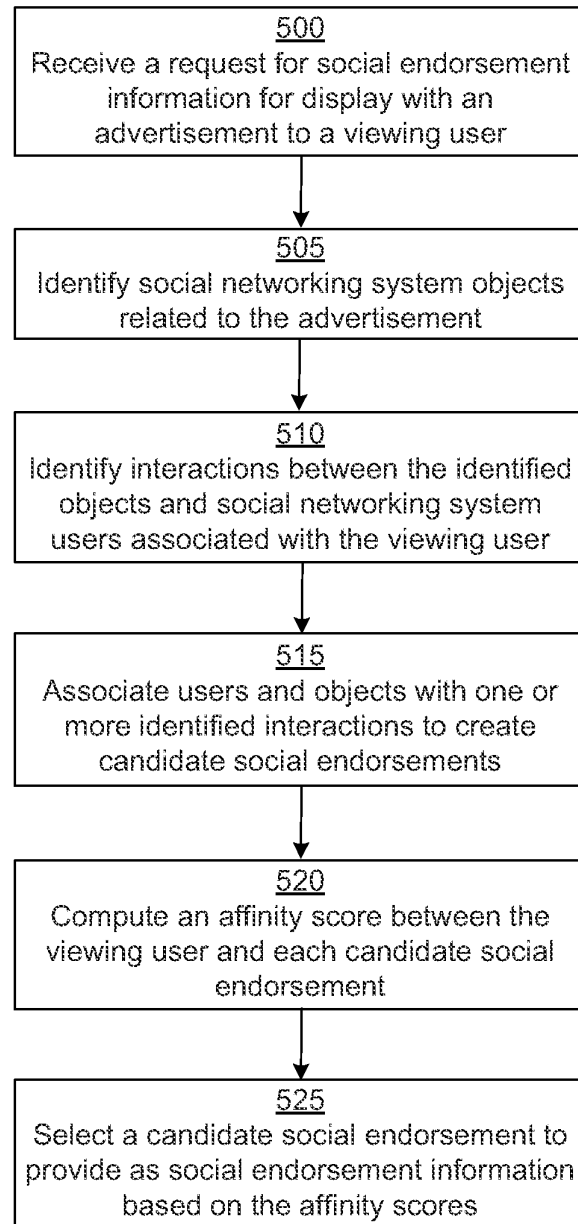


FIG. 4

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**FIG. 5**