

ABSTRACT OF THE DISCLOSURE

[0046] A system and method for regulating the flow of an electronic message in a social network comprises: creating the electronic message posted by a user in a social network, associating various permissions with the electronic message, notifying the user, information relating to flow of the electronic message from the user in the social network to other user, creating the path of the electronic message flow from the user in the social network to the other user and traversing the path of the electronic message flow from the user in the social network to the other user.

REF FIG: 1

CLAIMS

What is claimed is:

1. A method for regulating flow of an electronic message in a social network comprising:
creating, by a processor, the electronic message posted by a user in a social network;
associating, by the processor, various permissions with the electronic message;
notifying the user, information relating to flow of the electronic message from the user in the social network to other user;
creating, by the processor, path of the electronic message flow from the user in the social network to the other user; and
traversing, by the processor, path of the electronic message flow from the user in the social network to the other user.
2. The method of claim 1, wherein the step of associating various permissions to the electronic message further comprises:
message flow restriction, message visibility, follow of messages based on who has opted out to receive such messages and operations performed by the user in the social network.
3. The method of claim 2, wherein the electronic message flows from the user in the social network to the other user based on profile.
4. The method of claim 2, wherein the operations that can be performed by the user comprises at least one of: forward, delete and modify.
5. The method of claim 2, wherein the message flow restriction includes:

flow of the electronic message from at least one of the social network to the other.

6. The method of claim 3, wherein the flow of the electronic message from the user to the other user in the social network based on the profile includes one of: age, geography and language.
7. The method of claim 6, wherein the flow of the electronic message from the user to the other user in the social network is defined by at least one of:
the user posting the electronic message in the social network, and
determined automatically by the processor.
8. The method of claim 1, wherein notifying the user, information relating to flow of the electronic message from the user to the other user includes: a sender name, a receiver name, a message identifier, a time stamp and an environment.
9. The method of claim 1, wherein the path of the electronic message flow from the user to the other user in the social network is traversed, by the processor, to perform at least one of:
replace the electronic message;
modify the electronic message;
delete the electronic message stored in a memory;
hide the electronic message; and
add content to the electronic message.

10. The method of claim 1, wherein the path of the electronic message flow is traversed to determine influencer responsible for spreading the electronic message in the social network.

11. The method of claim 1, wherein the permissions associated with the electronic message can be modified during lifetime of the electronic message.

12. A method for tracking the spread of electronic message in a social network by determining a hop distance based on a number of hops the electronic message traversed in the social network.

13. A system for controlling flow of an electronic message in a social network comprising:
creating the electronic message posted by a user in the social network;
associating various permissions with the electronic message;
creating a path of the electronic message flow from the user to other user in the social network;
transmitting to the user, information relating to the flow of the electronic message from the user to the other user in the social network; and
traversing the path of the electronic message flow from the user to the other user in the social network.

14. The system of claim 12, wherein associating various permissions with the electronic message comprises:

message flow restriction, message visibility, follow of messages based on who has opted out to receive such messages and operations performed by the user.

15. The system of claim 13, wherein the electronic message flows from the user to the other user in the social network based on profile.

16. The system of claim 13, wherein the operations that can be performed by the user comprises at least one of: forward, delete and modify.

17. The system of claim 14, wherein the flow of the electronic message from the user to the other user based on profile includes one of the: age, geography and language.

18. The system of claim 17, wherein the flow of electronic message from the user to the other user in the social network is defined by at least one of:

the user posting the electronic message in the social network, and
determined automatically by the system.

19. The system of claim 12, wherein notifying the user, information relating to flow of electronic message from the user to the other user includes: a sender name, a receiver name, a message identifier, a time stamp and an environment.

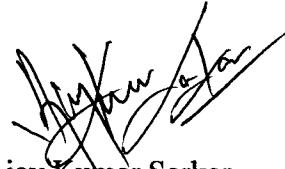
20. The system of claim 12, wherein the path of the electronic message flow from the user to the other user in the social network is traversed, by the processor, to perform at least one of:

replace the electronic message;
modify the electronic message;
delete the electronic message stored in the memory;
hide the electronic message; and
add content to the electronic message.

21. The system of claim 12, wherein the path of the electronic message flow from the user to the other user in the social network is traversed, by the processor, to determine influencer responsible for spreading the electronic messages.

22. The system of claim 12, wherein the permissions associated with the electronic message can be modified during lifetime of the electronic message.

Dated this 18th day of December, 2013



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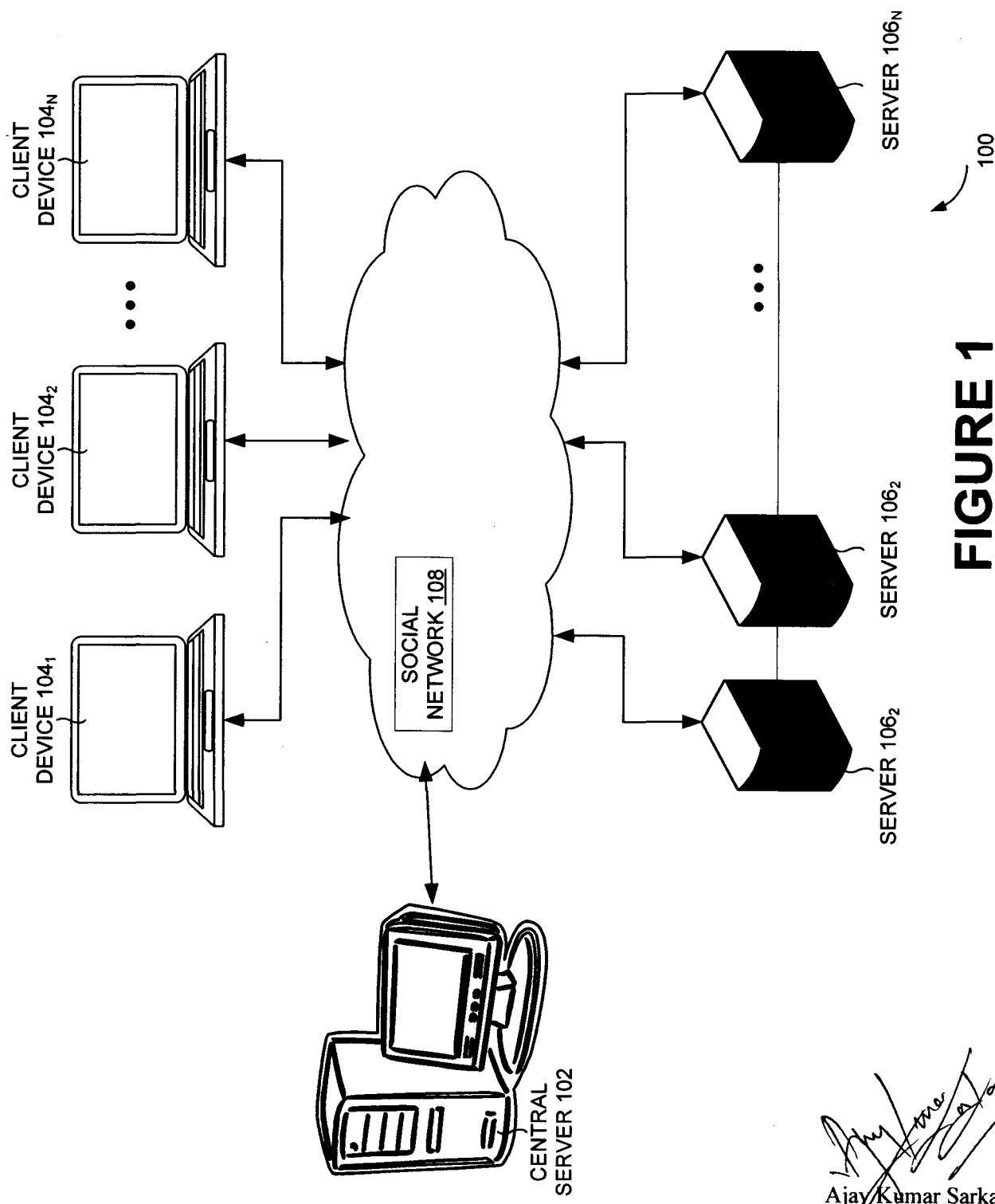


FIGURE 1

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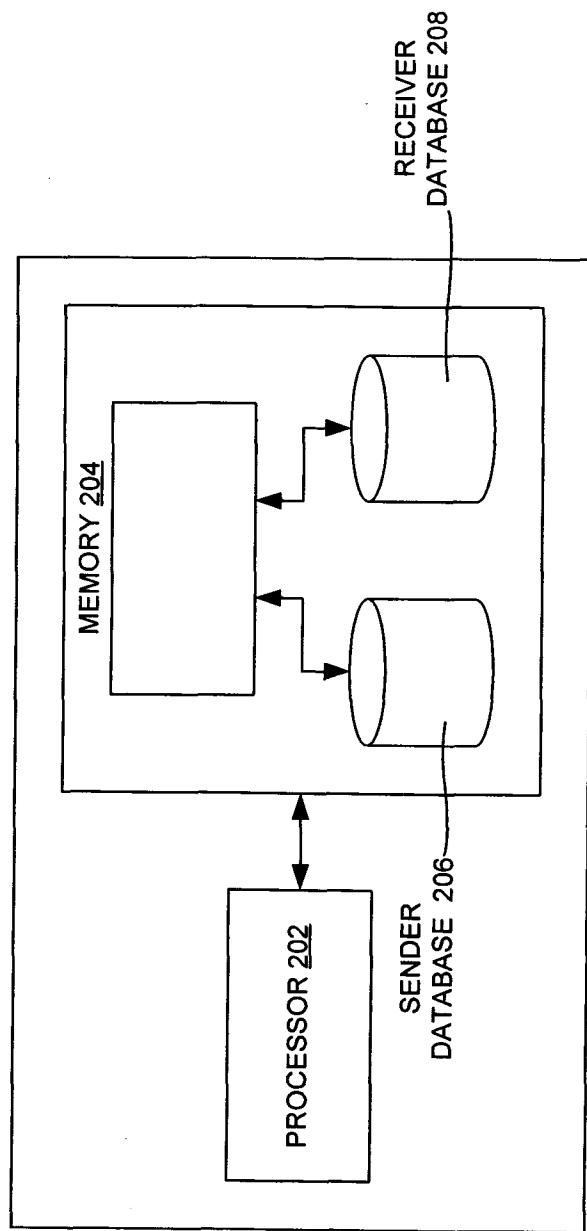


FIGURE 2

[Handwritten signature of Ajay Kumar Sarkar]
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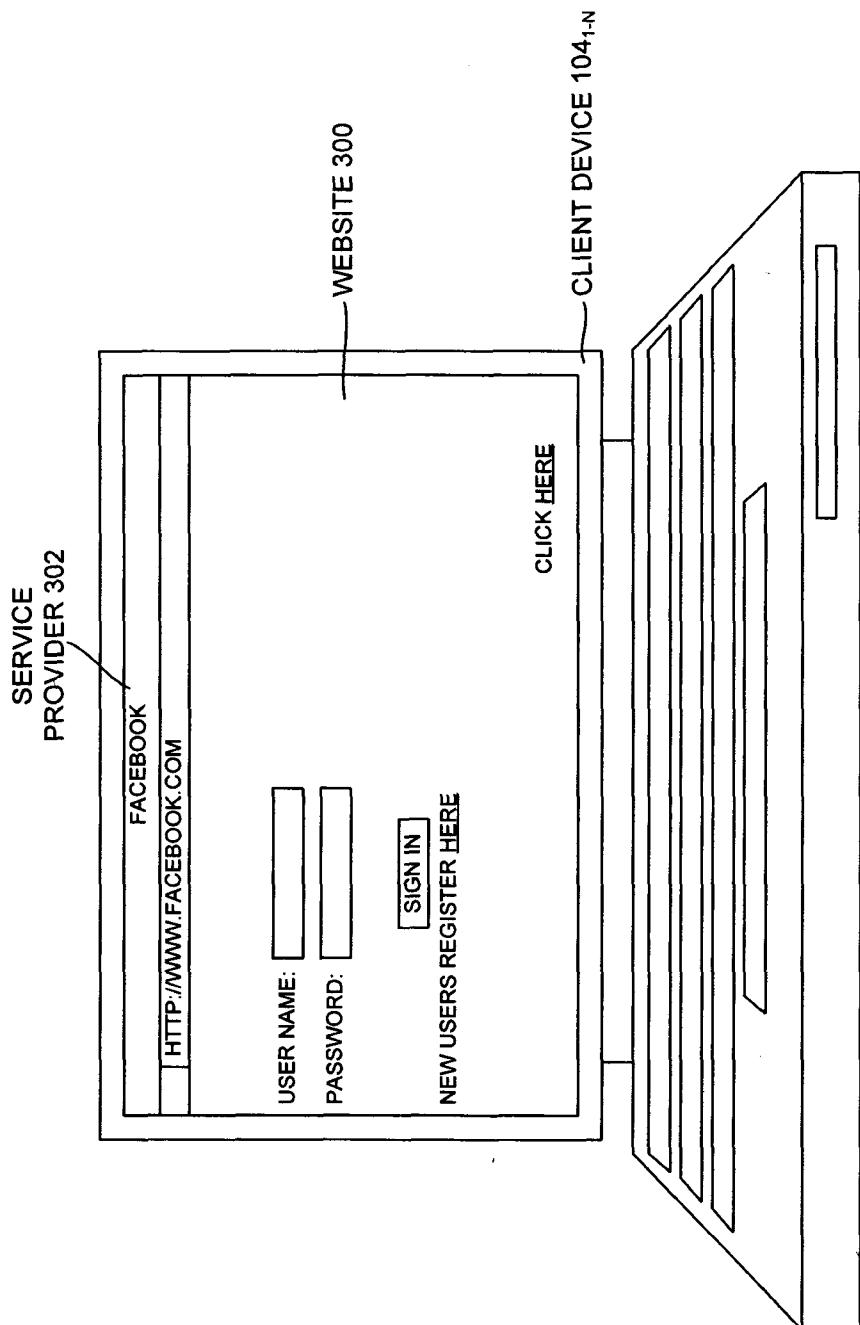
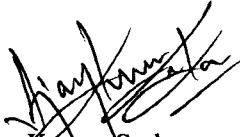


FIGURE 3


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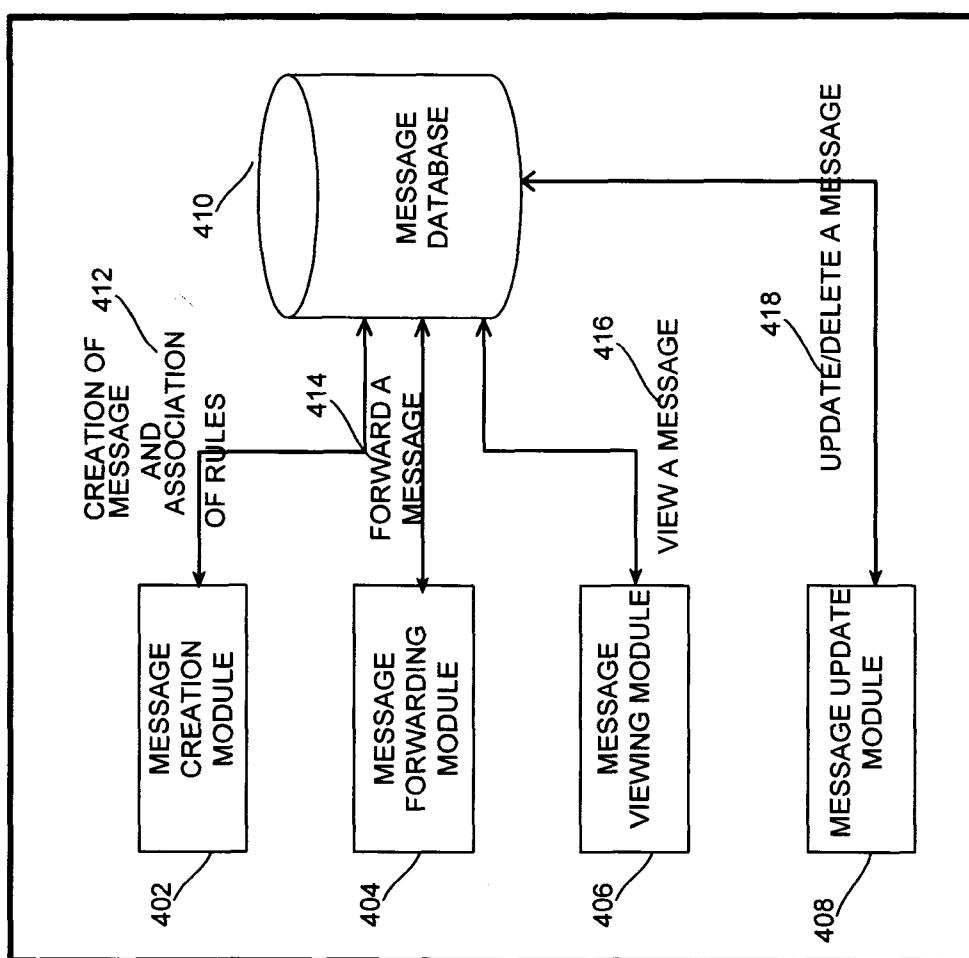


FIGURE 4

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The diagram illustrates a message structure with the following components and their labels:

- 500:** A bracket above the table, spanning the columns for **MESSAGE IDENTIFIER**, **MESSAGE CONTENT**, and **MESSAGE FILTER CRITERIA**.
- 502:** A bracket to the left of the **MESSAGE IDENTIFIER** column.
- 504:** A bracket to the left of the **MESSAGE CONTENT** column.
- 506:** A bracket to the left of the **MESSAGE FILTER CRITERIA** column.
- 508:** A bracket to the left of the **MESSAGE CONFIGURATION RULES** column.
- 510:** A bracket to the left of the **MESSAGE HOP DETAILS** column.

MESSAGE IDENTIFIER	MESSAGE CONTENT	MESSAGE FILTER CRITERIA	MESSAGE CONFIGURATION RULES	MESSAGE HOP DETAILS
1234	10% off on Product x	Geography = India. Gender = Male.	Forward = Yes	A->B B->C C->D B->C

FIGURE 5

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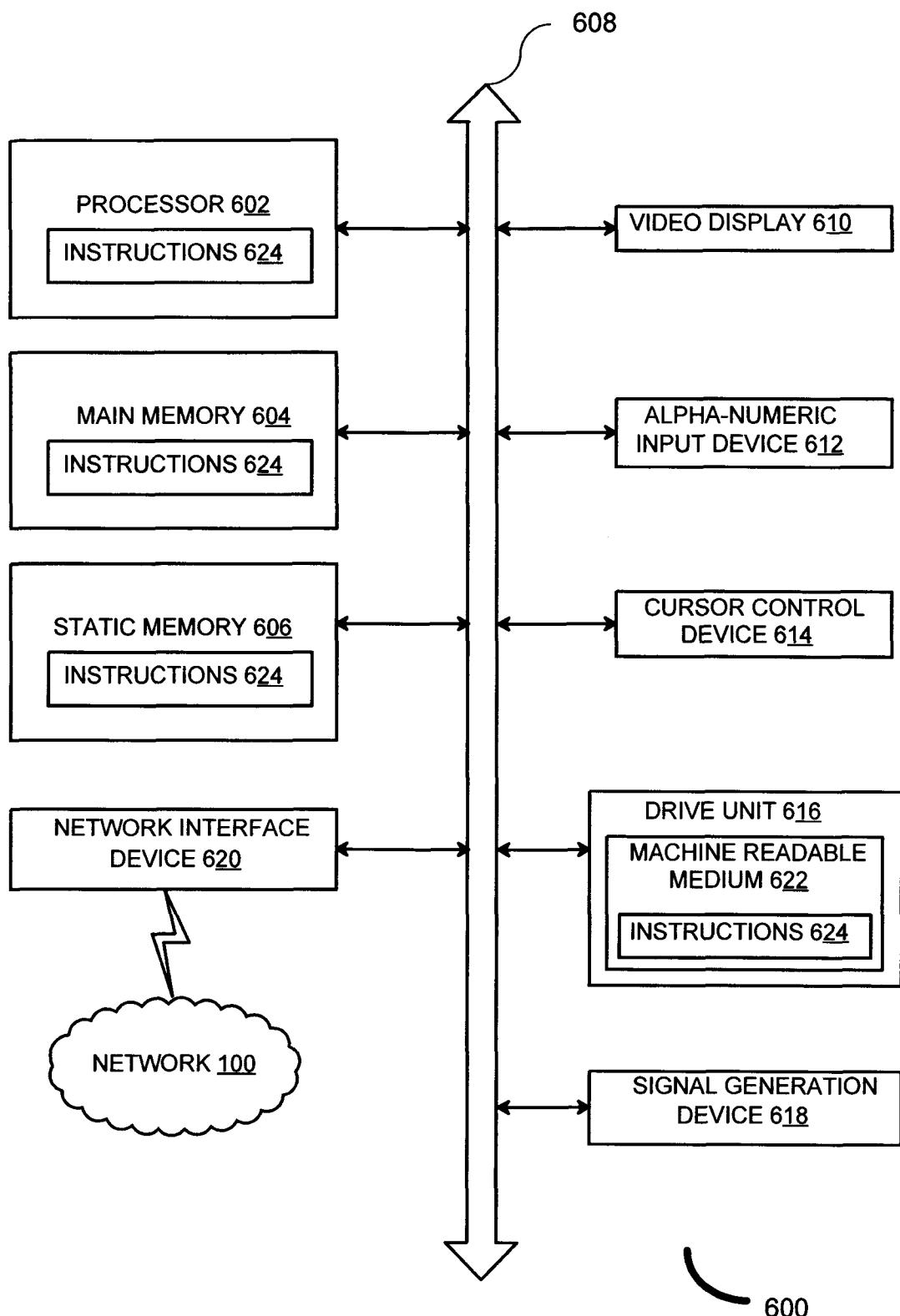


FIGURE 6


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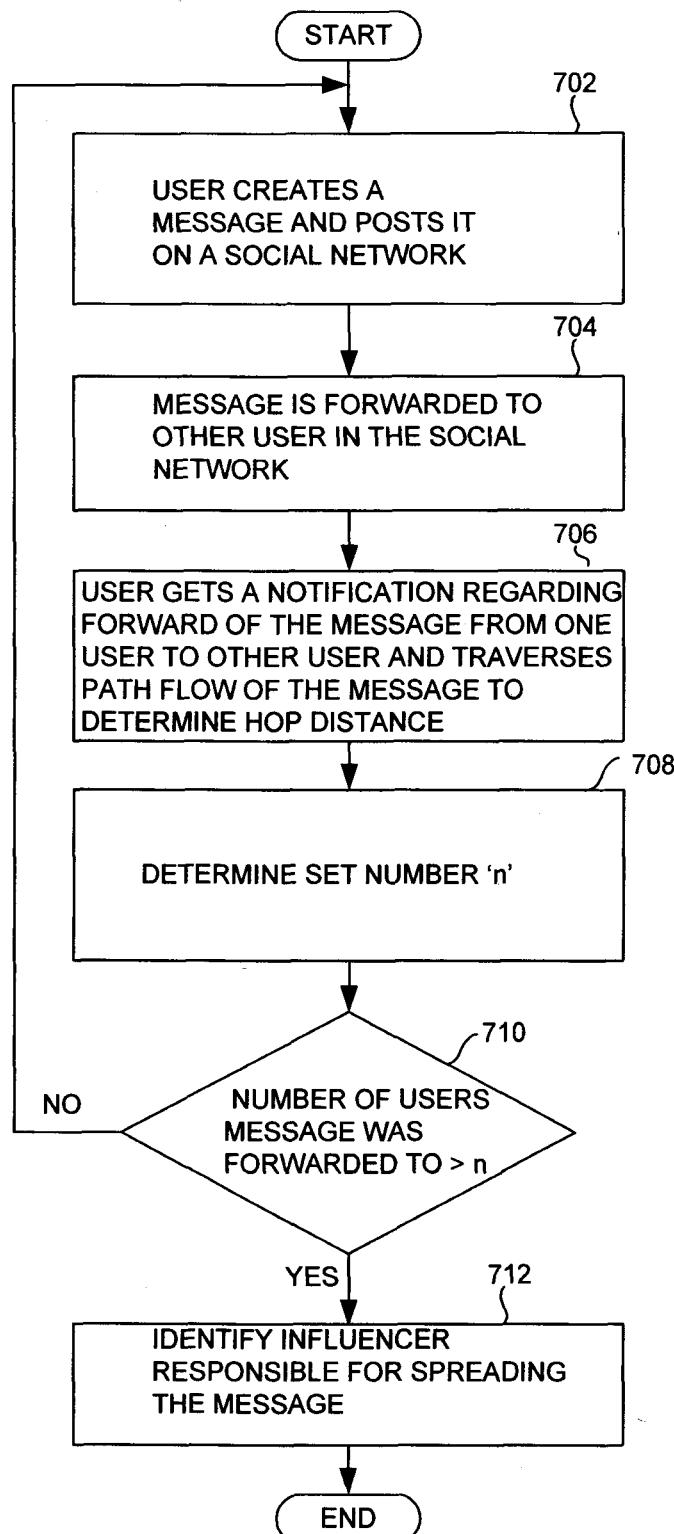
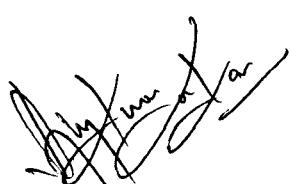


FIGURE 7



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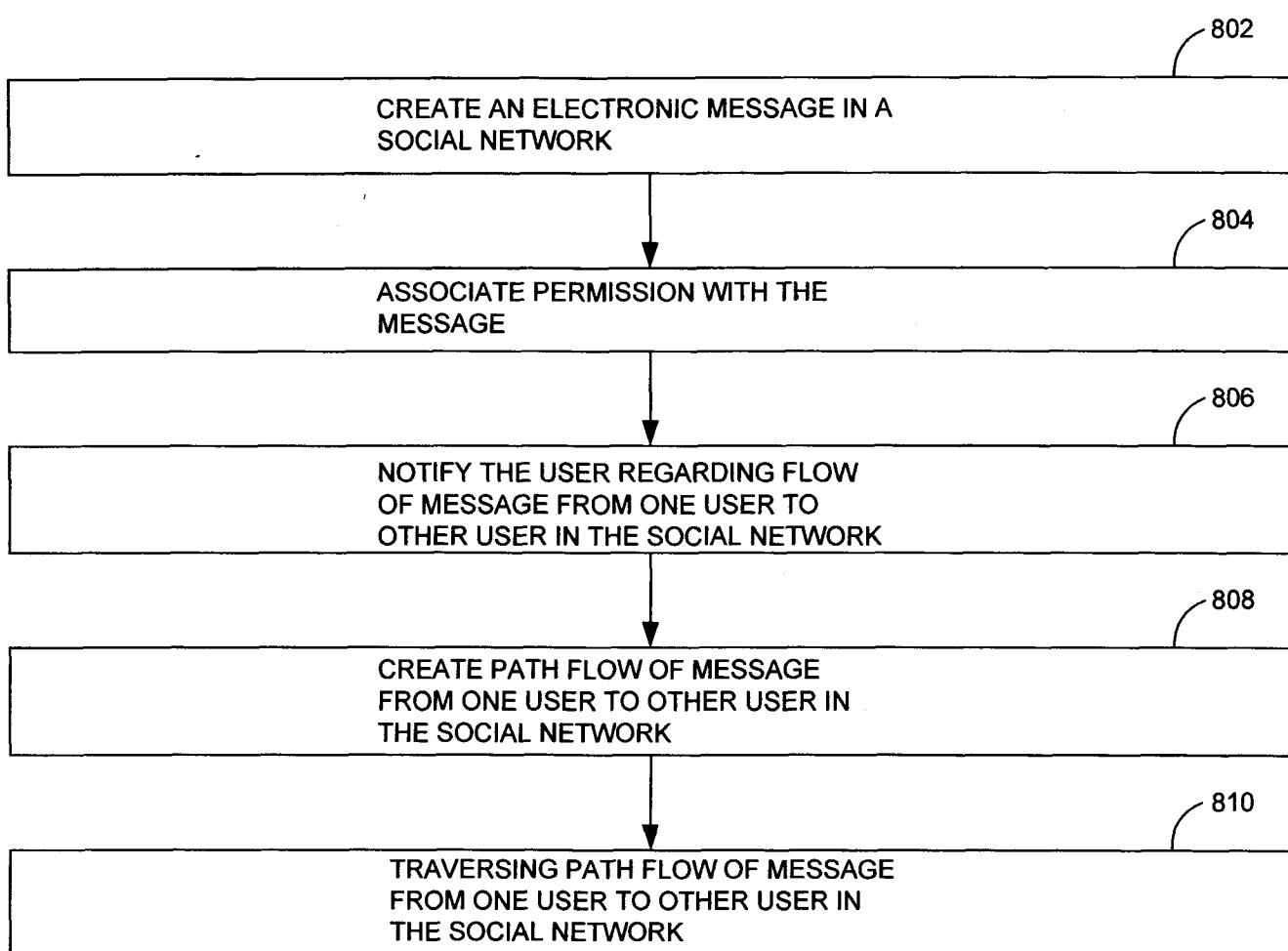


FIGURE 8

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A FRAMEWORK TO CONTROL AND MEASURE THE FLOW OF MESSAGES

FIELD OF TECHNOLOGY

[0001] This disclosure relates generally to messaging in social network and, more particularly, the method for regulating the flow of electronic messages in private and public social network.

BACKGROUND

[0002] With the advent of digital communication and social networking sites, more and more of our social interactions has become through these social networking sites. The technology is also available to provide a communication infrastructure enabling fast, efficient and reliable transport of this information from the providers of information.

[0003] The word of mouth distribution of information, i.e. passing information from person to person, constitutes another channel to assist users in identifying information of interest to them. A user who knows the information tells it to his friends, who then tell it to their friends and so on.

Several researchers have explored social networks for designing algorithms for spreading messages by finding influential users and communities. One popular practice employed by many brands is to broadcast the same message to multiple users. However, the broadcast method would not scale with increasing number of messages, as the users will start considering the broadcast messages as spam and ignore the messages.

[0005] One method is to select a certain number of people having the most friends. However, people selected by this method frequently are in the same social community and circle of friends and only cover a portion of the entire social network. Therefore, this method usually does not reach the maximum coverage. Another way of finding influencers is to try all combinations of a certain number of people that will maximize the spreading of the electronic message. However, this requires an inordinate amount of computation time, and therefore is not a feasible alternative.

Therefore, there is a need for a method to control and measure flow of electronic message in the social network by identifying key influencer responsible for spreading the messages.

SUMMARY

[0004] Disclosed are a method and/or a system to regulate the flow of electronic messages in a social network.

[0005] In one aspect, a method for regulating the flow of electronic messages in a social network includes creating by a processor, the electronic message posted by a user in a social network, associating various permissions with electronic message, notifying the user information relating to flow of electronic message from the user to other user, creating by the processor, path of the electronic message flow from the user to the other user and traversing by the processor path of the electronic message flow from the user to other user in the social network.

[0006] The method of electronic message flow regulation may include permissions associated with the electronic message such as message flow restriction, message visibility, follow of messages based on who has opted out to receive such messages and operations performed by the user in the social network. Message flow from the user to the other user may be based on profile. The operation that may be performed on the message by the user comprises one of: forward, delete and modify.

[0007] In another aspect, the method of regulating flow of electronic messages includes tracking spread of electronic messages by determining a hop distance based on number of hops the message traversed in the social network.

[0008] In another aspect, a system for regulating the flow of an electronic message in a social network includes creating by a processor, the electronic message posted by a user in a social network, associating various permissions with the electronic message, notifying the user

information relating to flow of the electronic message from the user to other user, creating by the processor, path of the electronic message flow from the user to the other user and traversing by the processor path of the electronic message flow from the user to other user in the social network.

The system of regulating flow of electronic message may include permissions associated with the electronic message such as message flow restriction, message visibility, follow of messages based on who has opted out to receive such messages and operations performed by the user in the social network. Message flow from the user to other user may be based on profile and the operation that may be performed by user comprises one of: forward, delete and modify.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Example embodiments are illustrated by way of example and not limitation in the figures of the accompanying drawings, in which like references indicate similar elements and in which:

[0010] FIG. 1 is a system diagram of one embodiment.

[0011] FIG. 2 shows implementation of an exemplary embodiment;

[0012] FIG. 3 is a user interface of one of the client devices in the social network, according to one embodiment.

[0013] FIG. 4 illustrate detailed implementation of system and method for regulating flow of electronic messages in the social network, according to one embodiment.

[0014] FIG. 5 is a diagrammatic representation of logical structure of the electronic message, according to one or more embodiment.

[0001] FIG. 6 is a diagrammatic representation of a data processing system capable of processing a set of instructions to perform any one or more of the methodologies herein, according to one embodiment.

[0015] FIG. 7 is a flow chart of the system for measuring and controlling flow of electronic message in the social network.

[0016] FIG. 8 is a process flow diagram of the method to regulate flow of electronic message in the social network, according to one embodiment.

[0017] Other features of the present embodiments will be apparent from the accompanying drawings and from the detailed description that follows.

DETAILED DESCRIPTION

[0018] Example embodiments, as described below, may be used to provide a method, a framework to control and measure the flow of message in a social network. Although the present embodiments have been described with reference to specific example embodiments, it will be evident that various modifications and changes may be made to these embodiments without departing from the broader spirit and scope of the various embodiments.

[0019] A social network may be a software application and/or a web site configured for maintaining profiles of users and associations between the users. The users typically enjoy a personal computer-implemented space enabling them to maintain a personal profile. A user may also typically communicate and conveniently share information with other users with whom the user may be associated in the social network. The social network application or, simply, social network may be referred as online social network. The social network may also be referred as 'Environment' in the foregoing description.

[0020] In one or more embodiment, the method will be described from the perspective of one or more users of the social network.

[0021] In one or more embodiments, information may be the electronic message being conveyed between the users of the social network.

[0022] In one or more embodiments, an electronic message may be an instant text message, video, audio or image shared between two or more users over the social network.

[0023] In one or more embodiments, a profile may be a collection of personal data and user-related information associated to a specific user.

[0024] In an example embodiment, user profiles may contain personal identification information such as name, address and/or email. In addition, demographic elements that may describe the users of the social network (e.g. age and geography). Further, user profiles may also contain groups that the users of the social network belong to, and other user-related information such as activities that user may perform, pictures that display users of the social network, likes/dislikes of the users, interests of the users, etc. other sets of information may be included in the definition of the user's profile, groups that the user of the social network has joined, dynamic context information, and so on.

[0025] The embodiments herein disclose a system and method for regulating flow of electronic messages in a social network.

[0026] In a social network, interactions between users play an important role in identifying key influencer. Influencer may be the user who has maximum number of friends to whom the message may be forwarded to. When a user of the social network receives an electronic message, the user has the option of sharing and/or forwarding the electronic message to his friends. The electronic message flows from the user to other user in a cascading manner. Any electronic message posted in the social networking site may be viewed by some of the users and circulated to other users through the social network using e-mail, blog-post, by word of mouth or by any other information transfer means. Thus, it is crucial to determine influencer responsible for viral nature of the electronic message.

[0027] FIG. 1 illustrates an exemplary communication network 100. As shown, communication network 100 of FIG. 1 includes social network 108, central server 102, servers 106_(1-N) and client devices 104_(1-N). In one embodiment, a plurality of client devices 104_(1-N) are communicating with each other via a social network 108. It should be noted that the social network 108 is not limited to a particular type of network. For example, the social network 108 may be implemented as a public network (e.g., the Internet) or a private network (e.g., a local area network). For example, the social network 108 may broadly comprise: a packet network, a circuit-based network, a cellular or wireless network, an access network, a Voice over Internet Protocol (VoIP) network, and the like.

[0028] Generally, client devices 104_(1-N) may include a mobile computing device capable of receiving and sending an electronic message over a network, such as social network 108, or the like. Such client devices include portable devices such as cellular telephones, smart phones, Personal Digital Assistants (PDAs), handheld computers, laptop computers, tablet computers, or the like.

[0029] In one embodiment, a service provider may provide communication services via a network, e.g., a core network service provider, a cellular network service provider, an access network service provider, a local telephone network service provider, a cable network service provider and the like. In one embodiment, the service provider may employ a server 102 (e.g., an application server). Broadly defined, server 102 may be capable of defining a social network for a user, wherein the user may be a customer of the service provider.

[0030] In one or more embodiments, as shown in FIG. 2, a processor 202 may be connected to a memory 204, a sender database 206 and receiver database 208. A user creates an electronic message in a social network 108 and associates various rules or permissions with it using the processor 202. The electronic message sent may be stored in the sender database 206. The user

has the option to share and/or forward the electronic message with other users in the social network **108**. The electronic message shared and/or forwarded may be stored in the receiver database **208**. When the user requests the processor **202** to display the electronic message available, the processor **202** retrieves the electronic message from the memory **204** and displays it on the client device **104_(1-N)**.

[0031] In one or more embodiments, user logs into a website **300** hosted by a service provider **302** from the client device **104_(1-N)** as shown in **FIG. 3**.

[0032] In another example embodiment, as described in detail in **FIG. 4**, a user interacts with a message creation module **402** to create an electronic message and post it on the website **300**. The user creates the message and associates various rules or permissions with the electronic message as shown in step **412**. The message may be stored in a message database **410**. The rules associated with the electronic message may be at least one of: restrict the flow of electronic message, restrict the visibility of the electronic message, share and/or forward the electronic message with the other users based on a profile (i.e. age, geography, language), restrict the follow of electronic message based on who has opted out to receive electronic messages and operations that one may perform on the electronic message such as forward, delete or modify.

[0033] The user may share and/or forward the electronic message with the other users in the social network **108**. The user may forward the message at step **414**. As the electronic message flows from the user to the other user, a message forward module **404** sends a notification **500** to the creator of the electronic message. The notification **500** comprises of a sender name, a receiver name, a message identifier, a time stamp and an environment. Time stamp may be the time at which electronic message was sent or received.

[0034] A path flow of the electronic message could be traversed by the processor **202** using information contained in the notification **500** sent to the creator of the electronic message. The

electronic message could be traversed to perform at least one of the following: replace the electronic message, modify the electronic message, add extra content to the electronic message, delete the electronic message and hide or unhide the electronic message.

[0035] The user receives the electronic message in a message database **410**. In response to the electronic message received in the message database **410**, the user requests the message database **410** to view the message at step **416**. A message viewing module **406** retrieves it from the message database **410** and displays it to the user on the client device **104_(1-N)** based on the rules associated with the electronic message.

[0036] The user may perform at least one of the operations on the electronic message such as forward, delete or modify. The user may update/delete the message at step **418**. All the changes are updated by a message update module **408** and are reflected in the message database **410**.

[0037] The user of the electronic message may change the permissions associated with the electronic message during the life time of the electronic message and in such case the message update module **408** enforces the change.

[0038] In one or more embodiments, a message identifier may be a unique number generated and/ or associated with an electronic message during the process of message creation.

[0039] In an alternative embodiment, one or more client devices **104_(1-N)** receiving and/ or forwarding an electronic message may determine a hop distance. The hop distance may be computed using a variety of ways, including, for example, including with the electronic message, information about a number of hops the electronic message traversed to reach a recipient; sending a notification **500** back through a chain of forwarding client devices where the notification **500** may be used to determine the hop distance; or any of a variety of other ways. Alternatively, the hop distance may be determined using any of the standard techniques. The hop distance may be

used to traverse the path flow of electronic message for controlling the electronic message flow in a social network **108**.

[0040] FIG. 5 shows logical structure of an electronic message. In one or more embodiments, a message identifier **502** may be a unique number generated for each electronic message during the process of message creation. Further, message content **504** may be information of interest to the user. For instance, the electronic message will be forwarded to a large number of users depending on how interesting the message content **504** may be to the user. A message filter criteria **506** may be the rules or permission associated with the electronic message, for instance, the electronic message could be forwarded to other user based on at least one of the: age, geography or language. A message configuration rule **508** describes whether or not the electronic message could be forwarded to a particular user. A message hop details **510** may be the path of message flow from one user to the other user.

[0041] In one or more embodiments, the electronic message may be forwarded to other user according to the message filter criteria. The user of the electronic message may define the filter criteria for the electronic message. Alternatively, the message filter criteria may be determined automatically by the processor **202**.

[0042] In an example embodiment, a user creates and posts an electronic message on a website **300** in a social network **108**. Various rules or permissions are associated with the electronic message. The electronic message may be shared and/ forwarded to other user in the social network **108** based on a message filter criteria **506** defined by the user. The message filter criteria **506** may be age, geography, language or gender. For instance, the user posts the electronic message about 10% off on product ‘x’ (message content **504**) and defines the message filter criteria **506** to be forward the electronic message to the other user if geography is India and gender is male as shown in FIG. 5. The flow of the electronic message from the user to the other

user may be tracked by the processor 202. Later, when the user wants to post the electronic message relating to product 'x' or the like, a group of users interested in the product 'x' may be known by learning module and the electronic message may be forwarded to the group of users automatically by the processor 202.

[0043] FIG. 6 is a diagrammatic representation of a data processing system capable of processing a set of instructions to perform any one or more of the methodologies herein, according to an example embodiment. FIG. 6 shows a diagrammatic representation of machine in the example form of a computer system 600 within which a set of instructions, for causing the machine to perform any one or more of the methodologies discussed herein, may be executed. In various embodiments, the machine operates as a standalone device and/or may be connected (e.g., networked) to other machines.

[0044] In a networked deployment, the machine may operate in the capacity of a server and/or a client machine in server-client network environment, and or as a peer machine in a peer-to-peer (or distributed) network environment. The machine may be a personal - computer (PC), a tablet PC, a set-top box (STB), a Personal Digital Assistant (PDA), a cellular telephone, a web appliance, a network router, switch and or bridge, an embedded system and/or any machine capable of executing a set of instructions (sequential and/or otherwise) that specify actions to be taken by that machine. Further, while only a single machine is illustrated, the term "machine" shall also be taken to include any collection of machines that individually and/or jointly execute a set (or multiple sets) of instructions to perform any one and/or more of the methodologies discussed herein.

[0045] The example computer system 600 includes a processor 602 (e.g., a central processing unit (CPU) a graphics processing unit (GPU) and/or both), a main memory 604 and a static memory 606, which communicate with each other via a bus 608. The computer system 600 may

further include a video display unit **610** (e.g., a liquid crystal displays (LCD) and/or a cathode ray tube (CRT)). The computer system **600** also includes an alphanumeric input device **612** (e.g., a keyboard), a cursor control device **614** (e.g., a mouse), a disk drive unit **616**, a signal generation device **618** (e.g., a speaker) and a network interface device **620**.

[0046] The disk drive unit **616** includes a machine-readable medium **622** on which is stored one or more sets of instructions **624** (e.g., software) embodying any one or more of the methodologies and/or functions described herein. The instructions **624** may also reside, completely and/or at least partially, within the main memory **604** and/or within the processor **602** during execution thereof by the computer system **600**, the main memory **604** and the processor **602** also constituting machine-readable media.

[0047] The instructions **624** may further be transmitted and/or received over a network **626** via the network interface device **620**. While the machine-readable medium **622** is shown in an example embodiment to be a single medium, the term "machine-readable medium" should be taken to include a single medium and/or multiple media (e.g., a centralized and/or distributed database, and/or associated caches and servers) that store the one or more sets of instructions. The term "machine-readable medium" shall also be taken to include any medium that is capable of storing, encoding and/or carrying a set of instructions for execution by the machine and that cause the machine to perform any one or more of the methodologies of the various embodiments. The term "machine-readable medium" shall accordingly be taken to include, but not be limited to, solid-state memories, optical and magnetic media, and carrier wave signals.

[0048] **FIG.7** shows flow chart illustrating one embodiment of the invention. At step **702**, user creates an electronic message and posts it on a social network **108**. The user may choose to forward the electronic message to other user in the social network **108** at step **704**. When the electronic message may be forwarded from the user to the other user in the social network **108**,

processor **202** sends a notification **500** to the creator of the electronic message as shown in step **706**. Notification **500** comprising of information may be used to traverse the path flow of the electronic message in the social network **108**, thus determining the hop distance.

[0049] Next, a set number ‘n’ may be defined by the user at step **708**. The set number corresponds to certain number of users to whom the electronic message may be forwarded to. In one embodiment, this set number may be defined by the user of the system **100** shown in **FIG. 1**. Alternatively, the set number may be determined automatically by the system **100**.

[0050] In step **710**, a determination may be made by the processor **202** whether the number of users the electronic message was forwarded to is greater than set number ‘n’. If so, then identifying influencer responsible for spreading the electronic message in the social network **108** or the electronic message going viral in nature at step **712**.

[0051] In an exemplary embodiment, a user defines the set number to be ‘n’. Processor **202** determines whether the electronic message was forwarded to more than ‘n’ users. If so, then an influencer responsible for spreading the electronic message is identified. Influencer may be the user who may have maximum number of friends in the path of electronic message flow.

FIG. 8 describes logical flow diagram illustrating detailed operation of the method used by system **100** in an exemplary embodiment as shown in **FIG.1**. The method begins at block **802** by creating an electronic message in the social network **108**. Rules or permissions are associated with the electronic message by a processor **202** at block **804**. As the electronic message flows from a user to other user in the social network **108**, the processor **202** sends a notification **500** to the user of the electronic message at block **806**. The processor **202** establishes path flow of the electronic message at block **808** and traverses the path of the electronic message at block **810** to determine a hop distance. Thus, the flow of the electronic message in the social network is regulated.