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A P2P Architecture to Integrate Heterogeneous Social Networks

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ABSTRACT

The exceptional development and significance of Social Network Sites (SNSs) have opened the chance for researchers to investigate a large amount of social and behavioral data. The heterogeneity of Social Network Sites further sparks research modernization to build methods and applications that integrate resources and offer more seamless services across Social Network Sites. Specifically, addressing at the assimilation of social relationship data, a not much studied subject, we introduce a peer-to-peer architecture, namely P2P-iSN, to merge the heterogeneous Social Network Sites. The P2P-iSN allows users from heterogeneous Social Network Sites to communicate without involving that social site they have registered with. With this architecture, we introduce a Global Relationship Model (GRM) to capture the relationship strength between users and then establish a searching mechanism, namely i-Search, to find out the optimal social path between any two users who are meaningfully connected in heterogeneous Social Network Sites. We calculate the performance of P2P-iSN and show that our P2P-iSN can productively use many future applications such as enhanced trust/reputation metrics and integrated content-sharing. With the proposed P2P-iSN, Social Network Sites developers can build more productive user-centric Social Networking Site applications.

***Keywords*— Social Network Site(SNS), peer-to-peer(p2p) architecture Global Relationship Model**

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I. INTRODUCTION

Today Social Networking Sites (SNS) have been a part of our day to day life. We share a lot of data on these sites. They have made the world smaller and integrated with each other. There are many SNS available today and many more are piling each day. Thus a user uses many SNS each day and communicates and share data with friends and family. This communication medium gave rise to complex structure whether a user really like the SNS which he uses more or he needs another SNS other than he uses more. As a result, a user can get register with multiple Social Networking Sites for different social network applications, uses multiple SNS accounts, communicate with contacts from various Social Networking Sites, publicize and connect with different web contents, and shares the contents with each Social Networking Site community. While SNSs offer different assistance, one key feature shared among SNSs is how they are created around users and users' existing in social networks. Yet each Social Network Site is isolated, so users manage their profiles and build relationship separately on different SNSs.

The content of the same user on various Social Networking Sites may overlap, so it becomes a difficulty for users to manage contents across different SNSs. This is the landscape of heterogeneous SNSs. This gave rise to the need of integrating all the SNS a user uses together and help the user understand and share the data and friends lists and many other things provided by the SNSs together and help the system analyze the user need and help him use the SNS efficiently in any case such as online and offline.

Social-networking sites provide numerous application services that can mash up user-profile information and data with another data. In addition, third-party sites can also distribute and spread their services via social-networking sites to keep in touch with user

In order to achieve the target of a P2P application our contributions are as follows:

- Integrated SNS system.
- Facility to store and use offline data

- Facility to use online data
- Facility to create our own SNS for the institution.
- Use of Android phones and desktops together.
- Use of SNS of various categories from social to technological SNS
- Application interface maintenance on the desktop software and Android phones.

Widgets to monitor the SNS..

II. ORAGANIZATION

The paper is organized as follows: Related work is presented in Section II. We present our scheme in Section III. The System Architecture is detailed in Section IV. We are concluding our work in Section V.

III. RELATED WORK

The pictorial overview of the existing system is given in Fig. 1. Social Network Sites (SNSs) such as Facebook and Linkedin have transformed today's society by providing easily accessible platforms for users to share & communicate vast amount of information. With Social Network Sites, people stay in touch with their contacts, reconnect with old friends, and make new relationships with others based on common features such as hobbies, interests, and mutual friends. The number of SNS users are increasing rapidly. For example, Facebook is estimated to have over one billion active users .Although it is hard to obtain a correct estimate, there are so many of SNSs all over the world that gives different kinds of services.

There are some disadvantages while using existing system as follows:

i) Homogeneous User can only communicate to each other within homogeneous network

ii) Heterogeneous users cannot communicate to each other.

iii) Message is not sent when user is offline.

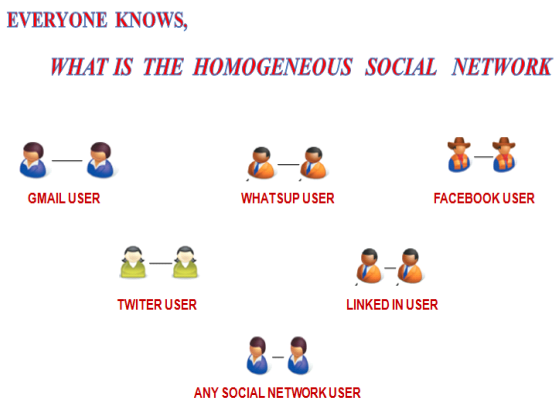

Fig. 1 Homogeneous Social Network

IV. PROPOSED SYSTEM

The heterogeneity of SNSs further sparks research modernization to develop methods and applications that integrate resources and offer more seamless services across SNSs. At the integration of social relationship information, a much less studied subject, we introduce a peer-to-peer architecture, namely P2P-iSN, to merge the all heterogeneous SNSs. The P2P-iSN permits users from heterogeneous SNSs to communicate without including the Social Networking Site they have registered with. Under this architecture, we propose Global Relationship Model (GRM) ,I-Search Mechanism.

V. GLOBAL RELATIONSHIP MODEL

In this section, based on P2P-iSN, we propose the Global Relationship Method to search for the global relationship between two users across heterogeneous SNSs. We first propose a tool to calculate the global relationship strength of any two different users over heterogeneous SNSs. Then we propose an i-Search method to find a meaningful directional path within two peer nodes in P2P-iSN.

$$Z(P) = \begin{cases} L & \text{if } L = 0; \\ \prod_{i=1}^{L} F(u_i u_{i+1}) & \text{otherwise } (i.e\ L \geq 1) \end{cases} \quad (3)$$

Fig. 2 Function Z(P)

System a function $Z(\mathbf{P})$ to calculate or estimate the strength of the global relationship between $u1$ and $uL+1$,which is defined in fig 2 A larger $Z(\mathbf{P})$ implies stronger global relationship. The strength $Z(\mathbf{P})$ is a powerful tool that can provide more precise friend recommendation and trust-able and reputed metrics, and also used as a basis for content sharing across SNSs.

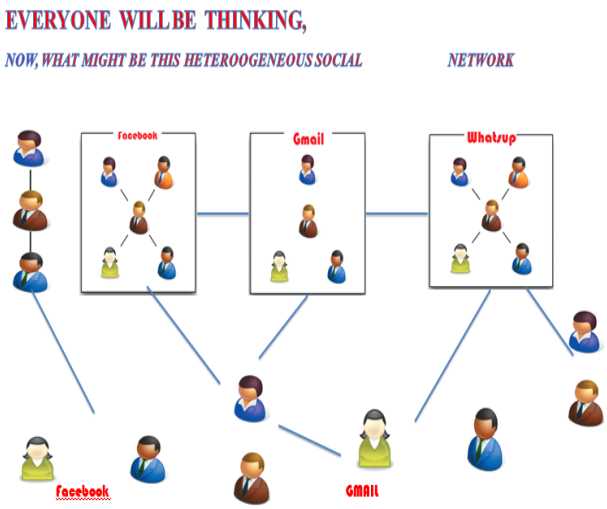

Fig. 2 a Heterogeneous Social Network

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VI. THE I-SEARCH MECHANISM

We propose an i-Search mechanism to find directional social path between two peer nodes in P2P-iSN. When a link is created into a path, global relationship strength is considered for the new path using the Z(P) function listed as in Figure 2. Whenever the global relation strength of the new path is less than threshold D, a new social path search is terminated. Note that D is used to promise that the global relationship strength for the build path is important so that users are inspired to use the global social relationship for further Social Networking Site applications.

These are the details for implementing i-search mechanism: The index peer node is used to take care of the online status (with the ID and IP address of the peer node) for the online peer nodes. A friend list is kept and maintained in the peer node, which is used to store the online information data for all friends of the peer node. To simplify our data, we are using the friend b of a peer node a to state that the social link a b is there. When a peer node is turned on, it signals its online status to the index peer node, and gets the newest online status for his friends from the index peer node. With the newest online data, the peer node can find out whether his friend is. A online peer node can easily contact with his online social friend circle directly. We are using a recursive algorithm, iSearch, in the peer node (Algorithm 1). In this algorithm, the set F is the friend list of a peer node. The input parameter i/p stores the ID of the peer node who calls given algo, and r is the ID of the peer node to be searched. Initially, we set P←ø . Consider scenario where the peer node a searches for the peer node d. A user a can "request" his friend b to execute the iSearch algorithm (i.e.,iSearch () in Algorithm 1 by using the direct communication if user b is shown online. That is, the direction of social path P is established along the online peer nodes. i-Search mechanism may find many number of global social relationships between different peer nodes. For the peer node who triggers the i-Search mechanism, he can use the one having the large number of global social relationship.
We can also speed up the execution of the i-Search method by caching the searched results on the peer nodes.

Algorithm 1: i-Search algorithm

Input:i/p,r,P,Z(P)

Output: P new , Z(P new)

1. for each v: v F - P do
2. if v = r then
3. P new←P {i/p→ v};
4. Z(P new) ←Z(P)F(i/p,v);
5. return;
6. else if v is online ,and Z(P)F(i/p,v) >Δ then
7. v .i-search(v,r,P {i/p→ v}, Z(P)F(i/p,v));
8. else if v is offline, or Z(P)F(i/p,v) ≤ Δ then
9. quit;
10. end
11. End

VII. SYSTEM ARCHITECTURE

We introduce a peer-to-peer (P2P) network, namely P2P-iSN, to integrate heterogeneous SNSs and establish global relationships over the integrated SNSs.

The Fig. 3.shows how proposed system will performs the operations.

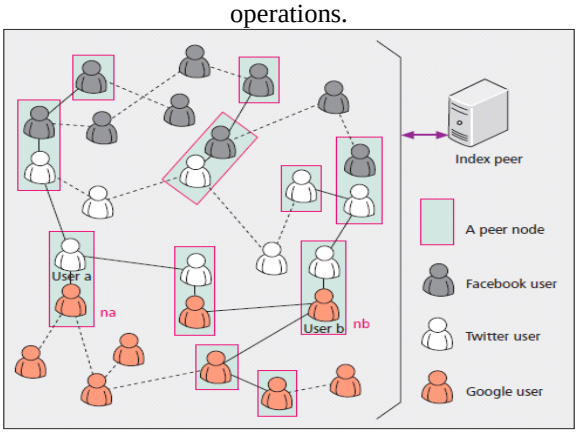

Fig. 3 Overall System Architecture

In above figure the overall system architecture of our project shown. If a peer node is shown as turned on, it signals to the index peer node his online status, which consists of its ID and IP address of the peer node after getting the online status, the index peer node changes the online status of that peer node.
The user of a peer node can register to one or many Social Networking Sites on the device he using, and possibly log into one or more SNSs at the same time. To relate or join these different accounts of the same user from heterogeneous SNSs, unique user ID may be required. The concept known as OpenID1 in can serve this purpose although any other uniquely identifiable ID can be used. An uncommon user ID can be a kind of authenticated data such as cell phone number of the user or verifiable email addresses. The index peer node is responsible for maintaining the status (i.e., online or off-line) and the routing information (i.e., IP address) for every peer node. Here is the sketch of the operations over P2P-iSN. When a peer node is switched-on, it sends report to the index peer node the online signal, which uses ID and IP address for the peer node.

After getting the online status, the index peer node changes to online status for the peer node. If a one user a of the peer node na and the user b of the peer node nb is on friend list of each other in a Social Network Sites, and na and nb are switched on, then these online peer nodes can address & communicate with each other by using the related IP addresses got from the index peer node. The peer nodes can create social paths among users from different Social Networking Sites.

VIII. CONCLUSION

This paper states a method for interconnection between heterogeneous social networking environment. Where two or more types users over different social networking sites can communicate with each other. Also, we propose Peer-to-Peer Architecture for Heterogeneous Social Networks, a peer-to-peer network architecture to integrate multiple SNSs without incurring excessive overhead to the SNSs.
Our system assures the confidentially of the data and maintains the secrecy of user from the cloud. With integrated as well as collected model, we could develop an effective approach, a Global Relationship Model, to

evaluate the global relationship strength between two users with more precision. With P2P-iSN and the Global Relationship Model as the foundation, we proposed the i-Search mechanism to find the social path with certain level of social relationship strength in a P2P social network.

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