# Bridging Disconnected Social Networks using Broker Discovery

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***Abstract*-All collaboration landscapes are interacting with each other across multiple organizations. Now a day's this has become a significant aspect. In that way, the organizations make unions to complete their planned objectives. The lively character of collaborations growth insists for computerized techniques and algorithms to support the making of such unions. The proposed approach is based on the proposal of possible unions through finding the present applicable capability sources and the support of partially automated formation. This is service-oriented environment which contains manual and software service with ideal ability. Here there is a broker concept to arbitrate separated groups and organizations which already exist. This is useful to bridge the disconnected networks. In this project we propose a dynamic broker discovery, it is depends on interaction mining techniques and trust metrics. Further this will assessed with the help of simulations in real Web services.**

***Keywords-Broker discovery, Interaction mining, page rank algorithm ,Social networks, virtual communities.***

## I. INTRODUCTION

Social network sites (SNSs) such as MySpace, Facebook, Cyworld, and Bebo had paid attention to millions of users, a lot of whom have incorporated these sites into their daily exercise. There are hundreds of SNSs, with several technical affordances, behind extensive variety of benefits as well as practices. As their key technical characteristics are somewhat reliable, the cultures that appear around SNSs are varied. The majority sites support the management of available social networks, but others assist strangers connect based on shared interests, political observations, or behaviors. Some sites provide to diverse viewers, as additionally appeal to public depends on common language or shared cultural, sexual, spiritual, or nationality-based characteristics. Sites also differ in the extent to which they include new information as well as communication tools, for example mobile connectivity, blogging, and also photo/video-sharing [17].

Social network sites as web-based services that permit individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site [17].

Social network sites are unique is not that they allow individuals to meet strangers, but quite that they enable users to articulate and make visible their social networks. This can result in connections between individuals that would not otherwise be made, but that is often not the goal, and these meetings are frequently between "latent ties" who share some offline connection. On many of the large SNSs, participants are not necessarily "networking" or looking to meet new people; instead, they are primarily communicating with people who are already a part of their extended social network. To emphasize this expressed social network as essential organizing feature of these sites [17].

In this work, we present the following key contributions:

- We introduce brokers to establish connections between independent subgroups in professional virtual communities (PVCs). Our approach enables the dynamic selection of brokers based on changing interest profiles.
- We define metrics and their application to support the discovery and selection of brokers including social trust in service-oriented collaborations.
- Our approach is to introduce the Broker Query and Discovery Language (BQDL) to discover suitable brokers based on query preferences. The novelty of BQDL is the ability to query social network data considering information obtained from mining results to fulfill the requirements for broker discovery in PVCs.

## II. RELATED WORK

We focus on strategic formation in social networks and communities [12]. The theory of structural holes was developed by Burt [3] and is based on the hypothesis that individuals can benefit from serving as intermediaries between others who are not directly connected. A formal approach to strategic formation based on advanced game theoretic broker incentive techniques was presented in [6].Our approach is based on interaction mining and metrics to dynamically discover brokers suitable for connecting communities in service-oriented collaborations. The availability of rich and plentiful data on human interactions in social networks has closed an important loop [5], allowing one to model social phenomena and to use these models in the design of new computing applications such as crowd sourcing techniques [2]. A wide range of computational trust models have been proposed [1, 8]. We focus on social trust [4, 11,14] that relies on user interests and collaboration behavior.

Technically, the focus of BQDL is to provide an intuitive mechanism for querying data from social networks. These networks are established upon mining and metrics. Thereby, properties of such networks are under constant flux and changes. BQDL is not a generic graph query language such as SPARQL [13], which has been designed to query ontological data. Instead, BQDL addresses the specific requirements for the discovery of actors such as brokers by accounting for paths and metrics obtained from mining results. In [9], a query language for social networks was presented. The language in [9] has some similarities with BQDL , however, without supporting the discovery of complex sub communities based on metrics and interaction mining techniques.

## III. VIRTUAL COMMUNITY

One of the first definitions of virtual communities is given by Howard Rheingold (1995) as “Virtual communities are social aggregations that emerge from the Net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in the cyberspace”, representing his early experiences in the WELL community [16].

However, a virtual community is a multi-disciplinary concept, which is difficult to define, thus resulting in many definitions depending upon the perspective from which it is defined identify that the definition perspectives range from multi-disciplinary, sociology, technology, business, economic to e-commerce viewpoints [16].

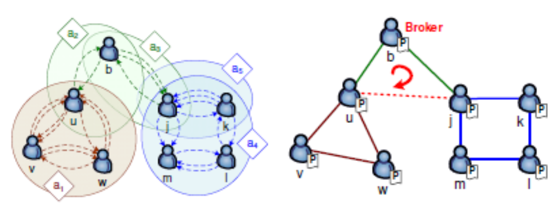
### *A. VIRTUAL COMMUNITY CHARACTERISTICS*

1. It is constituted by an aggregation of people.
2. Its element are rational utility-maximizes.
3. Its element interact with one other without physical collocation, but not every constituent necessarily interacts with every other constituent.
4. Its element are engaged in a social-exchange process that includes mutual production and consumption. While each of its element is engaged in some level of consumption, not all of them are necessarily engaged in production. Such social exchange is a necessary, but not always the only, component of interaction between the constituents of the community.
5. The social interaction between elements turn around a well-understood concentrate that comprises a shared objective (e.g. environmental protection), a shared property/identity (e.g. national culture or lifestyle choice), or a shared interest (e.g. a hobby).

E-commerce entrepreneurs take a very broad and loosely defined view on virtual communities. Any chat or bulletin board or communications software can be regarded as a virtual community. For them, the important issue is what draws people to and holds people in a community, the concept known as stickiness, so that they will buy goods or services. E-commerce entrepreneurs believe that communities not only keep people at their sites, but also have an important role in marketing, as people tell each other about their purchases and discuss banner ads, and help and advice each other [16].

### *B. ASSOCIATION SCHEME*

Let us discuss an actual collaboration scenario in PVCs as depicted in Figure 1. Various member groups collaborate in the context of five different activities $a_1$, $a_2$, $a_3$, $a_4$ and $a_5$ (see Figure 1(a)). These groups intersect since members may participate in different activities at the same time. The color of the activity context determines the expertise areas an activity is related to. Such activities are, for in-stance, the creation of new specifications or the discussion of future technology standards. Activities are a concept to structure information in flexible collaboration environments, including the goal of ongoing tasks, involved actors, and utilized resources such as documents or services. They are either assigned from the outside of a community, e.g., belonging to a higher-level process, or emerge by identifying collaboration opportunities. PVC members use SOA technologies to interact in the context of ongoing activities. The HPS Framework [10] allows human participation in a service-oriented manner. Humans can provide their capabilities and expertise as services to enable human interactions using standardized messages. Interactions are logged for analysis. Relations emerge from interactions as illustrated in Figure 1(b), and are bound to particular scopes. The context in which interactions take place is based on tags applied to various artifacts exchanged between collaboration partners. Tags are used to combine similar activities to create scopes (i.e., boundaries of activities). In the given scenario, a scope comprises relations between PVC members regarding help and support activities in different expertise areas (reflected by tags of exchanged messages). Scopes are used for different purposes. First, by analyzing the interaction context (i.e., using message tags), we determine users’ centers of interest. Frequently used key-words are stored in the actors’ profiles (see symbol P ) and later used to determine their interests and expertise areas. Second, we aggregate interactions that occurred in a pre-defined scope, calculate metrics (numerical values describing prior interaction behavior), and interpret them as social trust that is based on reliability, dependability and success[18].




(a) Member interactions. (b) Emerging relations.

Figure 1: Collaboration model for service-oriented PVCs: (a) interactions between PVC members are performed in the context of activities; (b) social relations and profile areas emerge based on interactions.

## IV. BROKER-BASED DISCOVERY SERVICE FOR USER MODELS

To understand along with exchange information with every additional applications require to be aware of the context, purpose and methods which other applications use to create their own models. The Broker-based Discovery Service for User Models (BD-SUM) is architecture for user modeling in a multi-application context, which allows various applications to discover and invoke semantically described user models. Our main goal is to enable user adaptive systems to work together and thus provide the user with a smooth adaptation across them. BD-SUM allows a strict separation and independence of the various knowledge and content models. For this, BD-SUM defines the components: UM-Broker, reasoned , matchmaker, invoker, and pool of ontologies , user modeling ontology and many other domain-independent). On the syntactic level BD-SUM builds upon UserML/UserQL and uses an orthogonal Markup Language for User Modeling (MLUM) for the representation and querying of user models. On a semantic level BD-SUM uses ontologies to represent the meanings of the different user models. New applications register by the UM-Broker and provide it with the ontological description of their internal user model, domain and possible other application models [15].

### *A. PAGE RANK ALGORITHM*

This can be accomplished by using eigenvector methods in social networks such as the Page Rank algorithm to establish authority scores (the importance or social standing of a node in the network) or advanced game-theoretic techniques based on the concept of structural holes. Consider two initially disconnected communities (sets of nodes) depicted as variables var source= {n1, n2, . . . , ni} and var target = {nj , nj+1, . . . , nj+m} residing in the graph G. R1: The goal is to find a broker connecting disjoint sets of nodes (i.e., not having any direct links between each other). A1:Two sub graphs G1 and G2 are created to determine brokers which connect the source community {u, v, w} with the target community {g, h, i}. O1: The output of the query is a list of brokers connecting {u, v, w} and {g, h, i}. Specify the input/output parameters of the query. D1: As a first step, a (sub) select is performed using the statement as shown by the lines 6-11. The statement distinct (node) means that a set of unique brokers shall be selected based on the condition denoted as the Where clause with a filter. The term '[1...*] n in source'.

## V. CONCLUSION

The existing platforms that support collaboration only provide single interaction models. However, the social networking systems supports more advanced techniques such as formation of collaborative environment and adaptive cooperation. The proposed approach is based on interaction mining and metrics to discover brokers suitable for connecting communities in service-oriented collaborations. The availability of rich and plentiful data on human interactions in social networks has closed an important loop, allowing one to model social phenomena and to use these models in the design of new computing applications such as crowd sourcing techniques. A wide range of computational trust models have been available in the literature. The proposed system focuses on social trust that relies on user interests and collaboration behavior. Technically, the focus of BQDL is to provide an intuitive mechanism for querying data from social networks. These networks are established upon mining and metrics. The algorithm used in the implementation of this project is "Page Ranking Algorithm".

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