Online Social and Business Networking Communities

Ina O'Murchu, John G. Breslin, Stefan Decker

Digital Enterprise Research Institute
National University of Ireland, Galway
University Road, Galway, Ireland
{ina.omurchu, john.breslin, stefan}@deri.ie
http://www.deri.ie/

Abstract. The ability to send and retrieve information over the Web using traditional and ubiquitous computing methods has changed the way we work and live. Web portals, as content aggregators, act as gateways to pertinent and up-to-date information. Social networking portals are a recent development, allowing a user to create and maintain a network of close friends or business associates for social and/or professional reasons. In this paper we suggest a classification schema for the main types of social networking sites and conduct an evaluation in terms of features and functionality.

1 Introduction

In recent years, the Internet and especially the Web has enabled a communication revolution: the ability to send and retrieve information everywhere has changed the way we work and live. Internet based access to information and internet communication means have become ubiquitous.

Web portals, as content aggregators, provide efficient access to information and services online: they are electronic gateways or entrances that provide numerous links to other sites and information that is needed. Since the information is available from one central place, the information access can be personalized to provide fast, focused, simplified and on demand access to required information. Increasingly web portals are playing an important role in the creation and support of online communities as audiences seek to exchange community related information. Community sites provide valuable opportunities for profit and non-profit communities by helping to eliminate time consuming tasks such as administrative tasks and information dissemination.

Social networking portals are a recent trend. A social networking site (SNS) connects and presents people based on information gathered about them, as stored in their user profiles. These user profiles determine the way in which users are able to present themselves to others. The most important distinguishing factor between the various sites is the range of profile information that they store and can perform operations on.

This paper presents a classification of social networking portals: e.g., whether they are registration or connection based; whether user profiles are social or professionally

oriented and if explicit relationships can be defined; whether sites are not-for-profit or profit-based.

The rest of the paper is structured as follows: in the next section we give a review of different kinds of portal sites and an overview of some popular social networking sites combined with an examination of the motivation for the development of social networking portals in particular. Section 2 describes a classification schema for social networking sites, and in section 3 an evaluation is presented according to several dimensions: search capabilities; communication and collaboration features; perception of users; privacy measures; and other issues.

1.1 Portals

The number of portals has steadily increased over the last number of years, and some of these have been very successful (e.g., the Yahoo! portal and amazon.com). This section of the paper categorizes and provides an overview of the many different types of portals that have now emerged in various business, social and community-related areas online.

Enterprise Portals. Enterprise portals enable enterprises to manage access to a company's information online by aggregating information from within and outside of an organization in one central and accessible site. Portals maintain, organize, analyze, and dissipate information and provide a means of integrating many separate and distinct systems that are used within an enterprising organization. The availability of organized and vital content and information is increased and the information is presented in a personalized manner to the user online whilst providing a common user interface. Enterprise portals have evolved from Internet portals bearing strong similarities and features to the Yahoo! portal to enterprise portals like IBM and SAP's enterprise portals.

Government Portals. Government portals are built and aimed at citizens to provide them with public information and services online from renewing their car tax to enquiring about their personal taxes, reducing the time and effort citizens (but also governments) are spending at using and providing those services. Government and government services become more accessible to citizens from one centralized place by documenting public information online, and improving public access and awareness to a government of information. Some examples include FirstGov.gov and Nutrition.gov.

Community Portals. Community portals[1] provide improved communication and contact with a community online providing local or community based information. They are the most widespread platform used by communities to inform electronically. Members can find information and contribute relevant shared information to others within the portal. Community portals provide an awareness and interaction amongst a community whether for profit or non-profit. Often community portals provide an online collaboration space (e.g., forums) for a community of certain interest. Community portals replace the traditional means of keeping a community informed via

---

[1] http://www.ics.forth.gr/~christop/Portals.html

libraries and publishing. They help to provide an online global community and communication agora and to strengthen the communities by informing them and providing an open place for communication, interaction, and the exchange of information and ideas. Some examples of community portals are NYCBloggers.com and Ennis.ie.

Semantic Community Portals. Semantic web technologies are used to enrich community portals. Most modern web portals process and share information amongst their members through a personalized central point. Most queries in searching for information are keyword based. The current web technologies are a serious limitation in making information accessible for users in an efficient manner [1]. A semantic web portal makes information accessible to both humans and software agents from a semantic viewpoint. Most web portals today do not provide machine-processable information. Semantic community portals can provide high quality searching features by providing semantic based browsing, querying and searching by making semantic information available to machines. Examples of semantic web community-type portals at present are the academic community portals Esperonto.net and OntoWeb.org. Commercial-type community portals include Empolis K42 and Mondeca ITM. The potential of using semantic web technologies amongst these communities could improve information processing and sharing amongst the members [1].

1.2 Social and Business Social Networking Sites

This section of the paper will discuss ten popular business and social networking sites that have appeared recently on the Internet. All of these sites have a steadily increasing membership and allow the creation of multiple virtual communities online. Members join the various communities, and by creating a user profile on the site, they can connect to one another within the community.

Ecademy (www.ecademy.com). Ecademy is a business networking site built up of a network of trusted business connections for people to share contacts and business opportunities. It is free to join, however membership can be upgraded to the so-called "power networker" level for €14 a month. It has a list of Ecademy clubs that its members can join, as well as listings of meetings and when they will be taking place. It also contains a list of networking regions globally for arranging meetings and events offline.

Friendster (www.friendster.com). Friendster, established in March 2003, has already attracted millions of members following many articles in popular computing magazines and newspapers and online "buzz". Friendster is primarily a site for social connections: for dating through one's own friends and their friends; for making new friends; and for helping friends to meet other new people. A member's photo and profile are only shown to people in their personal network, and messages can only be sent and received from those with a mutual network of friends. Friendster is currently in its beta phase, during which membership is free, but after the trial some subscription features are to be added.

Friendzy (www.friendzy.com). Friendzy is a free social networking site used mainly for making connections based on relationships of a sociable nature. It makes use of polls and a "friendzine" for people online, and aims to bring those people with differ-

ent views and opinions together. This is a good way of introducing people to one another, and so too, is the use of a number of icons called "friendzicons" that members can send to one another. Friendzy has led to a growth of online social network communities that are built up through online trusted connections. The site also lists a classifieds section that can be posted to by members of the Friendzy community. Friendzy helps to maintain connections and to build new ones socially between its members.

LinkedIn (www.linkedin.com). LinkedIn, founded in May 2003, focuses on professional users creating networks of co-workers and other business associates. LinkedIn allows members to look for jobs, seeking out experts in a particular area, or to make contact with other professionals through a chain of trusted connections. LinkedIn has professional looking design (in contrast to the more informal look and feel of sites like orkut or Friendster), and is probably the site with the least (if any) potential for social purposes.

Meetup (www.meetup.com). Meetup, set up in 2002, is a networking site almost entirely devoted to the arranging of meetings for communities with like-minded interests. Unlike most other social networking sites, where the focus is towards user profiles and their networks of personal friends or associates, Meetup organizes local interest groups that meet monthly at local cafes and establishments. Meetup earns money from establishments that pay to be listed as possible venues for these meetings, and also from services such as text advertising and its advanced MeetupPlus functionality.

orkut (www.orkut.com). orkut, a newcomer to the social networking scene, has attracted a lot of attention because of its links with Google, for whom the site developer works for. Primarily a social site, orkut has a relatively low user base as it requires an invitation to join. Communities are created under approximately thirty general category headings (similar to those found at the top level of dmoz.org, the Open Directory Project) and contain usual message forums and events listings. orkut has been criticized for its poor privacy policy, which has been revised.

Ryze (www.ryze.com). Ryze was originally an online business networking site, but members have also been using the site to communicate with other members for dating and other social networking purposes through the use of photos in each member's profile. It is a free service where people can join and become members of various different networks. However, members can also subscribe to gold membership at $9.95 a month which is a paid service that enables members to perform advanced searches. The Ryze site also organizes events for people offline. Ryze profiles contain guest books for other members to leave messages or e-mails for other users. It also lists a section for classifieds which members can post to.

Spoke (www.spoke.com). Spoke is a professional networking site that helps people to build a private and connected business network online. Spoke uses e-mail details and other information provided by its members in their user profiles to strengthen their relationships. Spoke also enables members to obtain referrals for jobs through people they already know and trust. Spoke members can use an "advanced chooser" system to increase their network size, searching by name, relationship strength or company.

Tickle (www.tickle.com). Tickle is a social networking site used for social activities such as dating and socializing. It makes use of a number of personality tests for matchmaking online. Tickle states that they apply science to help their members to build relationships online, providing a psychological analysis of each member's personalities and other insights through a number of tests. Tickle also charges $14.95 a month for a premium test subscription which gives unlimited access to every personalized report on the Tickle site. The site also contains a number of ice-breaking type e-mails that members can send to one another, as well as a number of fun tests. It also allows people to communicate directly to one another via a Tickle instant messenger.

Tribe (www.tribe.net). Tribe, which began in January 2003, is another social networking site in beta testing that aims to keep its services to members free of charge by deriving revenue from job postings and featured listings. While Tribe is primarily used for social purposes, for example if someone moves to a new area and they are looking for local information (like information about accommodation, restaurants or concerts), the site does include professional elements such as job postings. As well as each user having a defined set of friends, Tribe contains many categories of communities where each community is termed a tribe, and a message forum and events listing is associated with that tribe. Messages from forums are also made available in RSS format for use in desktop news aggregating applications.

1.3 Social Networking Motivations

People are able to use social networking sites for personal and professional use, communications, establishing new business developments and contacts, scheduling meetings offline, dating without initial real-world communication, and to build and manage their offline social networks online. Communities can be better informed more quickly through online social networking, and become more engaged and involved with one another in an era when social capital is on the decline [10]. The development of this new social and business infrastructure has motivated more people to join up with a specific aim in mind. Some sites like Friendster, orkut and Ryze use the photos for browsing (Friendster uses the term "gallery" for viewing individuals). People are curious and voyeuristic, they tend to browse through these photos searching for people they find attractive. orkut facilitates this by its "hot list" or "crush list" section where members can also send a teaser to the member they find attractive.

Another motivating factor for these social networks is that they are a new means of socializing and building a new community of people on moving to a new city; social networking sites can make it easier to join and connect to new people or communities within a similar geographical area, and to share common interests and join various urban tribes.

Members of sites are eager to sign up and increase their visibility within a network, and to get as many people to join their network making themselves look popular and important. The more connections a person has, the bigger their network is even if the connections are weak ties. orkut presents its members with large networks as connectors, celebrities and stars depending on the number of profile views, average paths and fan counts each member has. However the presence or over exposure on these

sites can also at times equate to a popularity contest based on status of how many friends or friends of friends one has. Not surprisingly the term "friendster whore"[2] has surfaced, meaning people who collect as many other people as possible for no other reason than to increase the size of their network. People are also motivated to search for interesting members on the site and to add these people as their friends. There is actually a specialized community on Tribe called "friendster whores"[3].

2 Classification

In the next subsections we develop dimensions how to classify social networking sites. The dimensions range from aimed audience to particular usage features.

2.1 Registration-Based vs. Connection Based

The majority of social networking sites have no restrictions as to who can join or when. These sites are registration based, where a person simply fills out a form of required details such as name, location, e-mail address and desired password. Registration for most sites is not subject to approval or moderation by another user, but usually does require some confirmation of details by clicking an activation link sent to the e-mail address entered. Once an account is activated, a user can begin adding friends to their network. While the registration process is usually quite short for most sites, some registration forms can be quite complex with optional questions ranging from previous employers to favorite meals. Unfortunately it is not always clear what information is required or optional when registering with a site.

There are some sites where an existing connection to a user on a site is required before membership to that site can be obtained. For example, to become a member of orkut, a non-member would have to contact a friend or acquaintance who is already a member of the site and ask for an invite, or alternatively an existing member would send an invitation to a non-member to join the site. This seems to keeps down the number of inactive accounts. eBay auctioneers were quick to cash in on the rush to become a member of the Internet's hottest community site, selling invitations to join orkut in the same way that low ICQ numbers or short domain names previously changed hands in auctions.

To establish a link with another user on a social networking site usually requires the agreement of that user. For example, on Spoke, an e-mail invitation message is sent to another user with who a connection is to be created. There are a few sites where this is not the case. Word of Mouth is an example of a site which does not require both users to register with the site to establish a link: the link is established by simply entering the e-mail address of the person with whom to create a link.

---

[2] http://www.zephoria.org/thoughts/archives/2003/09/index.html
[3] http://www.tribe.net/tribe/servlet/template/pub,TribeCard.vm/tribeName/friendsterwhore/

2.2 User Profiles

Social vs. Professional. User profiles are a means of providing an identity for users online. The type of information entered determines the type of profile that users of social and business networking sites will share and use. Business profiles allow professionals to interact with one another through business orientated information, endorsements, testimonials and reputations. This allows business professionals, owners and entrepreneurs to connect together and search for contacts by location or expertise.

Table 1. User profile information gathered by various social sites

User Profile Item	orkut	Friendster	Friendzy	Tribe	Tickle
User, Professional and Personal Details	Yes	No	No	Yes	Yes
Photo	Yes	Yes	Yes	Yes	Yes
Features	Explicit Viewing Through Photos	Online Gallery of Persons	Polls and Friendzine	View Tribes and People Browsing Through Photos	Gallery of Members and People Who Want to Meet Members
Sexual Orientation	Yes	No	No	No	Yes
Sense of Humour	Yes	No	No	No	No
General Interests	Yes	Yes	Yes	Yes	Yes
Number of Children	Yes	No	No	No	No
Favourite Music	Yes	Yes	Yes	Yes	Yes
Favourite TV Shows and Movies	Yes	Yes	Yes	Yes	Yes
Favourite Books	Yes	Yes	Yes	Yes	Yes
Favourite Food	Yes	No	Yes	No	Favourite Ice Cream
Name, Age, Country	Yes	Yes	Yes	Yes	Yes
E-Mail Address	Yes	Yes	Yes	Yes	Yes

Table 2. User profile information gathered by various professional sites

User Profile Item	LinkedIn	Spoke	Ecademy	Ryze	Meetup
Photo	No	Yes	Yes	Yes	Yes
Professional Details	Yes	Yes	Optional	Optional	No
Education Details	No	Yes	No	Yes	No
Experience Details	Yes	Yes	No	No	No
Features	Private Network	Inner Circle Network	Fifty Words	Guestbook	Can Join Any Meetup in Any City
Personal and Private Profile Details	No	Yes	No	Personal Only	No
Outlook Contact Mining	Yes	Yes	No	Yes	No
Endorsements	Yes	Referral Request	Guest Book	Guest Book	No

Social networking profiles are built on the personal information of members who participate and contribute in the online network. These personal profiles contain information from relationship status to member's religion and sexual orientation, and are shared with their friends and the extended community online. Some sites like

Friendster allow viewing of a reduced profile by anyone. Tables 1 and 2 list the various social and professional sites respectively and the information that their profiles contain.

Explicit Relationships. The main purpose of social networking sites is the explicit representation of relationships. Different social networking sites have different approaches with respect to representing social relationships and what a user of the site can do with this representation. Social networks are essentially about people and their relationships. Three types of social networking relationships are observed, and can be evaluated through the different kinds of intended audience for these types of sites.

Several sites like Friendster, Tribe and orkut are aiming at leisure and social activities. Other sites such as LinkedIn, Spoke and Ryze are aiming at the professional business user. A third type of site that organizes members for social events offline has been termed a real world events site. Meetup are catering for a niche in the different types of communities that are appearing online, by facilitating the way people can arrange and self organize one another and their groups to meet offline. The purpose and aim of the specific social networking site influences the way in which the site is designed and what information gathered through the user profiles will be displayed to which particular users.

Table 3. Comparing the depths of relationships of each site

Site	Depths / Degrees
LinkedIn	Network Closed by Default
Ryze	Explicit
orkut	Explicit
Friendster	Three Degrees
Ecademy	Explicit
Meetup	Everyone
Friendzy	Explicit
Tickle	Explicit
Tribe	Four Degrees
Spoke	Typical Network

Table 3 lists the different relationship types and depths that have evolved from these new community-connecting networking sites. In general, a social network is a set of people connected by a set of socially meaningful relationships. According to [7], online relationships are based more on shared interests and less on social characteristics. The recent crop of social networking sites that have appeared are based on the concept of six degrees of separation. Once members have contributed their information to the networks, there appears to be several depths to their online relationships that they can share with other members.

The main relationships are listed as friends, friends of friends, and friends of friends of friends (in essence, strangers). There is also the exposure to the entire network or community of persons. These ratings of friends are also given the term "degrees", and can be thought of as a type of weighting. People are unlikely to want people five degrees away to contact them or their own friends, so the viewing needs to be controlled. Viewing can be controlled on these sites by the individual members as to who can reach them and who their information will be available to through controls and settings within the sites themselves. Users are allowed to see profiles that can be set to the maximum or minimum number of degrees away.

A friend is defined as someone whose company and attitudes one finds sympathetic and to whom one is closely related. The orkut site has a friendship barometer that lets members rate their relationship to another member based on their actual relationship with that person: "have not met", "acquaintance", "friend", "good friend", and "best friend". orkut has a linear scale of friendships, but it is not detailed enough as there is not enough metadata as to what exactly it is that quantifies a friend. Also the information about the degree of friendship is not visible to other users and only serves for categorizing ones own relationships. LinkedIn masks a member's contacts, and they need to request the contact or in some cases to have outside contact with the other party. Networks from Ryze and Tribe to Friendster and orkut are explicit in that both interests and people are easily connected to others both through their photos and browsable links. However, there are limits, for example Friendster relationships are defined by referrals, so that a member can only browse four degrees away and not the entire network.

2.3 Business Models and Potential Profitability

Social networking sites have low overheads and aggregate large quantities of valuable information through user profiles, ranging from their favorite books to movies, and such information can be targeted for very specific advertising. A number of these sites have classifieds and even advertise openings for job opportunities. Some business networking sites like LinkedIn will perhaps prove to be more profitable. LinkedIn offers many valuable features to maintain and build up your business network and contacts. Making it easier to maintain and make new business contacts and making it a very effective way to maintain valuable business contacts. The value of the network increases as the number of members increases. The business networking sites provide more opportunities for people with membership subscriptions to look for jobs, contracts and other prospects creating viable options to make a profit on. Social networking at present is still looking for a solid business model. The business Model for social networks is unclear as how to make profits from these sites and the question remains if there is a potential revenue model. Venture capitalists continue to fund social and business networking sites however, giving rise to the speculation that there is a bubble within this niche in the market.

People on the Internet are already paying for subscriptions to various sites, especially the dating related ones. Following on from those who are willing to pay for online dating and matchmaking services, the CEOs of companies such as LinkedIn and Tribe are interested in how business people will connect for business, social or even matchmaking purposes online.

As these networking sites continue to attract and register new users every day in some cases millions of people, the race is on to find a competitive and working business model that will utilize the strength of numbers and valuable information collected. These sites can also be used to publicize a brand by targeting a company's publishing and advertising capabilities towards the large numbers of members that have signed up to a site.

Social networking technology enables people to connect in a way that closely mirrors natural social behavior. These structures are fundamental to the way people organize themselves and communicate, and yet personal communication products take no account of them fully as of yet.

Table 4. Revenue and profitability potential of various social networking sites

Site	Profitable	Potential Revenue
Spoke	Unknown	Business Contacts, Jobs, Referrals, Requests, Subscription
Ryze	Yes	Awareness of Brand, Business Contacts, Publicity
LinkedIn	Unknown	Business Contacts, Jobs, Referrals, Requests, Subscription
Friendster	No	Advertising, Classifieds, Community Subscription, Matchmaking Service, Membership
Tribe	No	Advertising, Classifieds, Subscription to Join Tribes
orkut	No	Advertising, Dating and Matchmaking Subscription, Subscription to Communities
Meetup	Yes	Advertising, Charge for Sites to Hold Meetups, Exclusive Membership for Meetups
Ecademy	Unknown	Connectivity to Business Persons, Jobs, Referrals
Friendzy	Unknown	Advertising, Matchmaking Subscriptions
Tickle	Yes	Advertising, Matchmaking Registration

3 Evaluation

In this section we evaluate some of the most popular social network sites in terms of the features they offer: communication and collaboration, searching and browsing, user ratings and trust. Privacy and other issues such as false identities and addiction will be examined, and finally some statistics on the various sites will be presented.

3.1 Communication and Collaboration Features

As well as the basic social networking features of user searching and profile browsing, many sites like orkut and Tribe offer a range of community building primitives. These include features allowing the building of communities, based on memberships with read and/or write privileges, and special communication features like message boards and event lists.

Current technological developments point to future social networking collaboration and communication techniques by means of mobile phones or network connected portable devices.

User to All. Weblogs or "blogs" have become a popular tool for users to make their opinions known online, and with at least 5 million weblogs in existence (Blogger has 1.5 million, LiveJournal 700,000 and Xanga 2.5 million), social networking sites such as Ecademy and Friendzy have begun to incorporate blogging or "story" features. Blogs are often exported to RSS or Atom XML formats for use by news aggregator software such as Radio User Land.

User profiles allow a user to communicate their personal and professional details to all other users on a social networking site, for example, their age, their employer's industry type or even their favorite TV show.

Another method of user to all communication is by means of a user's Friend of a Friend file [8], which is a standardized method of expressing the information usually found in a user profile, but can incorporate new fields as needed. Ecademy provides user profile information in FOAF format.

User to User. Most user to user communication on social networking sites is carried out by means of private messaging (PM) functions (e.g. using the "Personal Messages" module on Friendster), similar to sending an e-mail message except that the target username is specified rather than an e-mail address. Like e-mail, private messages can be sent to a number of users at once; however most social networking sites place some restrictions on the total number of people to whom a single private message can be sent. Unlike e-mail, no attachments can normally be sent with a private message.

E-mail messages can also be sent, but many sites keep their users' e-mail details secret, and messages are then sent via a web based form where the e-mail address is not displayed. On some sites, users can choose whether to make their e-mail address publicly viewable or not. There may also be restrictions on contacting members (by PM or e-mail) who are greater than a certain number of degrees away. This can be a site-wide setting or a degree number specified by a user in their profile.

Some sites store profile information on user's instant messaging (IM) or short message service (SMS) accounts, but do not normally provide any inbuilt functionality to send messages using these services, rather linking to external sites or resources that can provide this functionality.

Another method of user to user communication is the virtual card or vCard. vCards allow the automatic exchange of information typically found on a traditional business card. Advanced versions of vCards are not limited to text however, and can include photos, company logos, hyperlinks, etc.

Community Discussion. The community discussion forum has been a popular feature of Internet-based communication since the early days of mailing lists and USENET newsgroups. It has evolved beyond a static admin-maintained bulletin board into the realm of social networking, where communities can be created by any user (as on orkut and Tribe) and will live or die depending on whether they reach a certain critical momentum. The creator of a forum usually acts as the moderator, pruning undesirable threads and banning unwanted users from the forum.

Community forums are classified in categories according to major social or professional topics, depending on the type of parent site. They may also integrate event meeting calendars, as on orkut and Meetup. On some sites, the creation of a commercial community forum is forbidden and can result in a user ban.

Most community forums on social networking sites (e.g. orkut and Tribe) employ some threaded display methods, where topics are initialized by a certain user and replied to by others.

One of the important things to note regarding communities is that they can be used to enhance the software that they are running on. An administration discussion forum

can raise useful suggestions or bug reports that can increase the usability of the underlying software.

Internet Relay Chat (IRC) has long been used by communities to host real-time discussion of various topics. With the advent of metadata storage and searching of chat conversation logs, and the use of Java-based applets to offer IRC functionality on the Web, chat collaboration features are being incorporated into social networking sites.

The wiki is another method for community collaboration that has yet to feature on most social networking sites. Wiki, derived from the Hawaiian word for quick, allows a community open read and write access to a database of pages, even if a user is not the originator of the material being edited. This flexibility can either be highly successful in a healthy busy community or disastrous in an indifferent community where anonymous users can make unwanted changes to a wiki set. However, wikis normally employ a version control system so that rollback to a previous version can be employed, and in a busy community any deleted pages will normally reappear if they are important.

FOAF (www.foaf-project.org). FOAF (Friend of a Friend) [8] is an exchange format (based on RDF) to exchange profile and networking information. People are mostly using the FOAF format to express their information as an RDF file and post it on a website, where crawlers are gathering and aggregating the information (for example, SECO [9]). Some social networking sites have started to use the FOAF format for exchanging user profile information (e.g. Tribe and Ecademy).

Real World Events. Event listings are a major feature of social networking sites. These are usually either linked to an entire site as a general meeting for all members, or to a particular community with events listed beside a particular discussion forum. Some sites such as Meetup focus almost exclusively on arranging meetings for particular communities, being either localized or distributed with meetings for that community topic occurring worldwide at the same time.

3.2 Searching and Browsing Capabilities

Social networking sites must provide some mechanism for users to search and browse for information, ranging from matching other individual users or communities who have shared interests to looking for a new job in a particular industry or location. Table 5 classifies a number of sites in terms of what area their searching functionality is focused on. From top to bottom and left to right, these range from social to real world events to professional. While most sites are targeted towards either professional or social pursuits, there are a few like Tribe and Tickle that allow comprehensive searching and browsing in both areas.

Social sites devoted to user relationships and dating tend to focus their searching functionality on personal information such as age, gender, current relationships. For equality reasons, most professional networking sites ignore age and gender (except Ryze) and instead focus on searching through users' current jobs and employers. Both social and professional sites allow searching of interests, locations and communities since these are common matching requirements.

Communities, consisting of discussion forums and real world event details, can be searched in terms of keywords in their name or description (e.g. Tribe, Meetup and Ecademy). However, when a keyword is not apparently obvious for a search, browsing the categories of communities is often unwieldy due to the creation of top level categories and no subcategories on many sites, leading to hundreds of communities (tens of pages) being listed within a single category that must be browsed through manually.

Table 5. Search (s) and browsing (b) functionality of various social networking sites

	1	2	3	4	5	6	7	8	9	10
Friendzy	1									
orkut		2								
Tickle			3							
Tribe				4						
Friendster					5					
Meetup						6				
Ryze							7			
Ecademy								8		
Spoke									9	
LinkedIn										10
User Relationships	s	s	s	s	-	-	-	-	-	-
User Gender	s	s	s	s	-	-	s	-	-	-
User Age	s	s	s	s	-	-	-	-	-	-
User Interests	s	-	s	s	s	-	-	s	s	-
User Favorites	s	-	s	-	s	-	-	-	-	-
User Associations	-	-	s	-	s	-	s	-	s	-
User Location	s	s	s	s	-	sb	s	s	-	sb
User Articles	b	-	-	-	-	-	-	sb	-	-
Community Articles	b	b	b	b	-	sb	b	sb	-	-
Community Events	-	b	b	sb	b	sb	b	sb	-	-
Community Names	sb	s	sb	s	-	sb	sb	sb	-	-
Community Descriptions	sb	s	sb	s	-	-	sb	sb	-	-
Community Categories	b	b	b	b	-	b	-	b	-	-
Classified Advertisements	b	-	-	-	-	-	-	-	-	-
User Real Name	s	s	s	s	s	b	s	s	s	s
User E-Mail	s	-	s	s	s	-	-	-	-	-
User Job Name	-	-	s	s	-	-	s	s	s	s
User Job Description	-	-	-	s	-	-	-	s	-	-
User Job Prospects	-	-	-	-	-	-	-	-	-	s
User Employer Name	-	-	s	s	-	-	s	s	s	s
User Employer Category	-	-	s	-	-	-	-	-	s	sb
Site Help	b	sb	sb	b	s	b	sb	b	sb	b

Some sites offer unique searching and browsing functionality not found on other sites. For example, LinkedIn, with their partner DirectEmployers.com, are aiding users in their search for new employment. Ecademy also allows searching of content posted by users in their weblogs. Friendzy allows users to browse classified ads, grouped by type or location. Other sites like Meetup do not focus on searching for users or content at all, but rather on browsing possible topics for real world community meetings.

Searching for a particular user can be restricted by what settings the user has specified in their control panel, or by an initial default setting for a site. For example, on Friendster, the default setting is that users who are over three degrees away from a particular person cannot see how they are connected to that person and cannot view

their full profile (instead they can only see a reduced version of that person's profile). This can make searching for some users difficult, and some people must arrange outside the social network to make a connection manually within it.

3.3 Perceiving Other Users

Karma. A user's reputation can not only be affected by how they relate to other people in the real world, but also by how they conduct themselves in an online social network. Social networks often employ a variety of methods to allow users to add positively or negatively to another user's personal reputation or rating, thereby affecting how that user is perceived by the rest of the network. Rating another user can be carried out in a private or public manner.

orkut is unique insofar as that it offers people the chance to express how they feel about fellow friends and other members through a rating system known as "karma" points. In this system, "sexy", "cool" or "trustworthy" points are awarded by people to their friends (represented by heart, ice cube and star icons respectively in their profiles). This is a good way for people to get feedback on other members, and creates an interest in the members of a person's social network by fostering a curiosity as to who is rated amongst their friends so highly and the reasons why.

An endorsement or testimonial is another feature of social networking sites, where a fan or friend will declare exactly what it is that they find positive about another user. Most sites like Friendster or Tribe require that the user must approve the testimonial written about them. A similar feature is provided by orkut, whereby a user can publicly declare them as being a 'fan' of another user without an explanatory message.

Trust Mechanisms. Having a positive reputation or testimonial is a type of trust mechanism, similar to the ratings system employed by eBay where auction transactions completed successfully or unsuccessfully are linked to a person's profile and will often determine whether another user will deal with them or not. In professional sites, this is particularly important if for example five matches are returned while looking for a venture capitalist with two degrees of one's personal network, and no other determination can be made apart from user ratings as to whom to contact.

While an endorsement is also a useful way of determining whether to trust another user or not, some emphasis should be placed on the number of degrees between the endorser and the endorsee to ensure that a person's friends are not the only people extolling their virtues. This does not seem to be a feature of most social networking sites at the moment.

"All are equal, but some are more equal than others". The users of a social network can have an elevated perceived status if they are identified in some desirable way, for example as an entertainment celebrity or the founder of a popular community. Some sites such as orkut place emphasis on their users being stars, and use this as an attraction for new members. The success of a community forum can lead to their creators or moderators having a desirable status within that community, since they usually have the power to remove members, edit or delete discussion topics, or even erase the community completely.

A user can also be perceived as a minor celebrity if their network of friends extends into the hundreds. By presenting certain members of the network on special pages and publicizing data on the number of views their profile has received, these persons can have an elevated status. It becomes desirable to know that popular person, and hence to become a member of their network or inner circle.
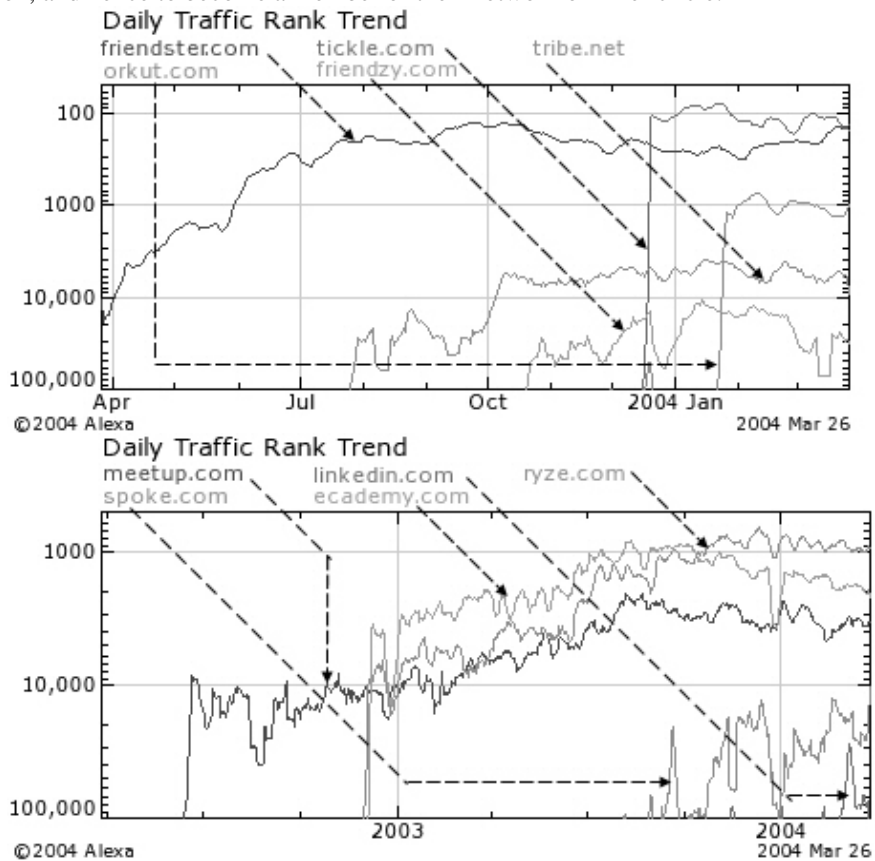

Fig. 1. Traffic history graphs for groups of social and business sites respectively

3.4 Statistics

While accurate statistics on social networking sites are difficult to obtain due to the lack of publicly available independent data, some idea of their relative popularity can be obtained from traffic history figures provided by Alexa. Fig 1 shows the traffic history for sets of social and professional sites. The graphs represent each site's position in the top 100,000 sites as ranked by Alexa daily. Professional sites have a longer history, and traffic is shown over a two year period.

On some sites, the amount of statistics or demographics available to a user can depend on whether they are a subscribing member or not, or can depend on how long they have been registered with a site.

The membership figures [3] for the various sites over the six month period from September 2003 to March 2004 make interesting reading. According to Tickle (established as eMode in 1999), their numbers have increased from 17 to 18 million, a 5% increase. Meetup has increased from 870,000 members to 1.45 million, an increase of over 30%. Friendster [4] has increased from 4 to 6 million members, a 50% jump. Tribe has increased its membership from 58,000 to 113,152, a relative increase of nearly 100%. orkut has already amassed 271,490 members since its launch last Feb 2004. Clearly, this rapid growth trend is only beginning.

Some sites also list the number of views that a particular user's profile has had in total. This can increase a user's desire to complete all the optional fields in their profile, since this may provide more matches to searches performed by other users, and possibly add to their own popularity.

3.5 Privacy

As defined, privacy is "the freedom from undesirable intrusions and the avoidance of publicity". The arena of social networking sites that has recently developed actively encourages people to contribute information about themselves to these sites freely. People are providing this information consensually without giving much thought or concern to the issue of privacy. In some cases, members provide information about their friends through testimonials. Personal information is much more open to abuse at present from the malicious elements in society, that is, persons who can potentially abuse the information in user profiles depending on how much information a member is willing to reveal to everyone in their network, or the exposure depth that the member sets their profile viewing to. The aggregation of information gathered in the user profiles makes them extremely valuable and collectable.

One approach to privacy is given in Friendzy's privacy policy, which says that they may provide personal information directly to a third party in order to facilitate or outsource aspects of their services such as search technology or e-mail support. It is possible that these social networking sites will use user profile information to mine data for targeting specific advertisements. Sites like Friendzy and orkut inquire as to what a person's favorite books, TV shows and movies are. It is quite possible that these social networking sites will be able to target their intended audience, and even make recommendations and personalization advertising to their members. At present, in the case of orkut and the recently launched personalized search agent from Google, this is perhaps aiming at the specific user and their tastes and interests. orkut's privacy policy states: "we may share both personally identifiable information about you and aggregate usage information that we collect with Google Inc. and agents of orkut". When orkut launched in January 2004, their privacy policy originally warned that "by submitting, posting or displaying any materials on or through the orkut.com service, you automatically grant to us a worldwide, non-exclusive, sub-licensable, transferable, royalty-free, perpetual, irrevocable right to copy, distribute, create derivative

works of, publicly perform and display such materials" [5]. This question of whether personal details are to become the new currency of the digital market is not a new one [6].

Details such as contact address, age and date of birth are all potentially open to abuse and identity theft. Despite the claims of sites that contain the TRUSTe or Web-Trust logos, just how highly the privacy value of these sites has been rated have yet to be determined. Unfortunately, it is still the case that most users sign up and contribute information without even reading the privacy policy.

LinkedIn is far more aware of privacy: they states in their privacy policy that they are the sole owner of the information collected on the site. LinkedIn also never lists the people to whom a member is directly connected to. By default, a member's network of professional persons is closed. The site itself also strongly discourages users from placing e-mail addresses or other contact information in their user profiles.

Another issue with privacy is the mining of contacts from the Microsoft Outlook e-mail client by sites such as Spoke, LinkedIn and Ryze. Priceless contacts are uploaded to these sites despite all the privacy warnings. The problem with these types of sites is that they are located in one central point, and even though the possibility of hacking into the sites is slim, it is still a possibility and open to criminal theft.

3.6 Other Issues and Factors

There are a number of issues surrounding these social and business networking sites and one of the biggest ones is the question of identity. Are people really who they say they are and is the information in a user's profile true? Members such as movie stars and celebrities, famous politicians, and make believe characters have cropped up on many of these sites. Sites like orkut and Friendster have galleries of people who can be browsed, and this also makes these sites highly addictive. This section will review these new issues in the online world.

Fakesters. These are false identities that many people assume when online, often in the form of contemporary celebrities and stars, but also people can take photos of real people and steal their identities (especially with the widespread use of camera phones and in particular when reputations of people are valuable). Identity theft is even more difficult to monitor as most networking sites are not able to identify who is legitimate and who is not. In the past, Friendster has taken a dislike to these fakes as they have the potential to undermine real persons on networking sites. Friendster has attempted to eliminate all of these fake users by removing them from their sites and servers. This forced removal of accounts does not seem to follow the natural evolutionary process of sites that are emerging on the Internet at present. The culture that is emerging with social networking sites has yielded terms like "friendster", "fakester", "friendster whore", "orkut-certified", "orkut jail" and "tribe", and these are very quickly emerging as new figures of speech in modern society and parlance.

Addiction. A lot of these sites are extremely addictive and it is quite easy to spend valuable time searching through the sites out of curiosity or from a voyeuristic point of view, especially on sites such as Tribe, orkut, Friendster and Ryze where there are galleries of persons to view and where the relationships are explicit. It is all too easy

to browse and take an interest in persons that you see online, and to take a peek into their lives. This can create a sense of familiarity with people you do not know and this can be brought into the real world, as a sense of knowing that person online can make a person feel or believe that they know that person in the real world too. There is also the potential or danger in this of stalking people offline.

However, is the virtual representation of humans in two dimensions likely to replace the real three dimensional models? It is unlikely, as there are only so many ways in which personalities can be represented online in these social sites. It is not really possible for these sites to represent the full human experience or model everything in the offline world, especially in the world of dating as there are so many more factors involved in dating rather than just a two dimensional set. Imitating all the senses online is quite a distant achievement as of yet. There is also the issue of how will these social networking sites promote a sense of social responsibility amongst its members, both offline and online, although the issue of common sense does play a large part in the use of these types of sites.

4 Conclusions

This paper provides an overview of portal sites and the rationale for the development of portals specifically dedicated to the creation of social networks. A classification of social networking portals has focused on sites tailored towards social or professional pursuits, and a comparison of the methods for establishing membership and user-to-user links on such sites was presented. An evaluation was performed on search, communication and privacy features, as well as the relative popularity of a number of prominent sites.

However, these sites are at the evolutionary phase, and there is the problem that once people join them there are no incentives to return to them once the initial interest wears off. There are also many steps to go through before these sites can evolve into a persistent form of social identity on the Internet.

These sites need to make more of the emerging technologies such as FOAF, RSS and XML feeds as they grow and evolve. RSS and weblogs could be used more to circulate content and context about individuals, thereby increasing the value of the relationships. Sites could also contemplate linking together using RDF to create a truly online community as a whole. Another issue is the categorization of the communities on these sites: this needs to be strengthened as thousands of forums for different communities often lie under a single topic or category.

The control of unsolicited emails will need to be set within these sites in accordance with the user's profile and their needs so that the user has more democratic control over their presence in these online networks.

Some sites incorporate features that have multiple applications, blurring the line between professional and social, as in the case of the Ryze business network where members have begun to date one another. In other sites, the border of use for the network is more clearly defined.

We are seeing the shift towards a "metaweb" of semantic relationships between sites. With the rise of the social and business networks described here, we are also

seeing a growth in the number of connections and relationships between people. These links allow us to make valuable contributions to one another: facilitating positive links across a network for opportunities such as learning, collaboration, etc. The next generation communities will evolve as a mixture of humans and intelligent software, forming knowledge networks that will enable a type of distributed intelligence across the Internet amongst individuals, communities, and social and business networks.

There will be the evolution of these types of sites also with the auto-creation or nomination of RDF assertions about individuals based on the user profiles. There will also be an emergence of social networks for knowledge collection, collaboration and dissemination. There will be a people search based on either the most connected individuals or on those most connected with you.

The role of the user profiles in these networks will steadily increase in value as these networks take a shortcut through the sea of persons out there on the web to show the value of these connections based on the relationships people have with one another.

References

[1] Lara, R., Han, S.H., Lausen, H., Stollberg, M., Ding, Y., Fensel, D.: An Evaluation of Semantic Web Portals. In: Proceedings of the International Conference in Applied Computing (IADIS04), Lisbon, Portugal (2004)

[2] Wellman, B.: For a Social Network Analysis of Computer Networks. In: Proceedings of the 1996 ACM SIGCPR/SIGMIS Conference on Computer Personnel Research. ACM Press, New York (1996) 1-11

[3] Heineman, M., Kim, G.: Surfers Spend Nearly Two Hours on Friendster, an Hour More Than Top Dating Sites. Nielsen//NetRatings Press Release, 26 November 2003. http://www.nielsen-netratings.com/pr/pr_031126_us.pdf

[4] Hopkins, J.: Investors Court Social-Networking Sites. In: USA Today, 9 December 2003. http://www.usatoday.com/tech/news/2003-12-09-meet_x.htm

[5] Black, J.: Privacy Matters: The Perils and Promise of Online Schmoozing, New Issues About Online Privacy. In: Business Week Online, 20 February 2004. http://www.businessweek.com/technology/content/feb2004/tc20040220_3260_tc073.htm

[6] Baig, E.C., Stepanek, M., Gross, N.: Special Report on Privacy: The Internet Wants Your Personal Info, What's In It for You? In: Business Week Online, 5 April 1999. http://www.businessweek.com/1999/99_14/b3623028.htm

[7] Wellman, B., Gulia, M.: Virtual Communities as Communities: Net Surfers Don't Ride Alone. In: Smith, M.A., Kollock, P. (eds.): Communities in Cyberspace (1999) 167-194

[8] Brickley, D., Miller, L.: FOAF Specification, 13 March 2004. http://xmlns.com/foaf/0.1

[9] Harth, A.: SECO: Mediation Services for Semantic Web Data. In: IEEE Intelligent Systems, Special Issue on Semantic Web Challenge (2004)

[10] Putnam, R.: Bowling Alone: The Collapse and Revival of American Community. Simon and Schuster, New York (2000) 288-290