CHAPTER 1

INTRODUCTION

1.1 SOCIAL NETWORK SITES

Social Networking is gaining popularity in an exponential scale. Social Network Sites (SNS) provide an online avenue for likeminded people to meet in cyber space. It also provides an effective business platform for entrepreneurs, to promote their business online. It can also facilitate open online forums for like-minded amateur or even professionals such as writers, actors, musicians and the like. But novice users of social Network Sites (SNS) still do not realize the potential and danger of SNS. The procedure to become a member of any SNS is very simple, that anyone can enroll by answering a few basic profile based questions. The danger starts with revealing his/her personal information to the rest of the world. The easy way to understand a social network is to compare it with a circle of friends in schools days or traditional groups formed within a community.

SNS is normally based on certain specific structure that could allow people to express themselves and meet people of similar interests. This structure may include profiles, friends, groups blog posts and widgets which would be limited to that particular restricted user within SNS.

The advantage of joining different social networks is experienced through increased communication between friends, professionals and businesses. The main advantage of social networking is connecting to friends
and family easily well, even beyond the geographical boundary. The simple requirement is internet connectivity.

Similarly, for any professionals social networking could help in terms of connecting to persons who can improve their career. To increase the chances of connecting to the right people, it’s highly recommended to search for social networks that focus on a definite area of interest. Although, there are social networks geared towards professional profiles, connecting to specific social networks really help, not only in connecting to like-minded professionals but also for sharing the information. As everyone is facing the same challenges, data sharing would be helpful for the society to move forward faster.

Although SNS provide the platform of advantages, there are dangers associated with it that includes data and identity theft, which are on the rise. The most common danger often involves online predators or individuals who claim to be someone that they are not. Therefore, the two important aspects of SNS as given below:

i. Increased usage of like-minded users forming into group within SNS and

ii. Security threats attached with SNSs.

1.2 TREND OF SNS AND RESTRICTED USER FORUMS

As per the predictions of Morgan Stanley, it is found that Social Network had 830 million unique users in 2009. According to the Information Tele Communication Union (ITU)’s World Telecommunication/Information and Communication Technology (ICT) Development Report (2010), almost fifty percentage of internet users are using SNS. It is generally believed that, this trend is clear to grow further in the near future.
Many social network users access these services through their mobile phones. According to ITU’s report “Measuring the Information Society 2010”, mobile broadband subscriptions reached 640 million at the end of 2009, determined by the rising demand for smart phones, novel applications and social networking services, and are expected to exceed 1 billion in 2011. The Facebook crossed the notable target of 500 million users on 21 July 2010, it shows that the usage trends of SNS is rising exponentially.

At the WSIS Forum in May 2010 in Geneva, co-organized by ITU, the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations Conference on Trade And Development (UNCTAD), a high-level discussion on “Social Networking” was held, the discussions was initiated on political and social implications of social networking for online community. In the debate, organized jointly by UNESCO and ITU, the visions of users, policy creators and society on opportunities and threats of SNS tools for the future was discussed.

Owing to the nature of users of SNS being wide, and the inability of the SNS to cater to all needs, restricted user forums of common interests have originated within SNS in the last couple of years.

1.3 ISSUES IN SOCIAL NETWORK

1.3.1 Privacy and Security Issues

Social networks still have to face certain challenges especially on the users’ perceptions, since these challenges could affect the user’s and also the social network’s reputation. User information and personal data are invariably obtained and preserved by SNS service providers. It is important for users of social network to consider these issues and to protect themselves from negative consequences of them on social network.
The most important issue to users as well as to social network administrators is the security. It can happen in any given time with or without the online presence of the user. Attacks on different social networking websites are always possible, because the measures taken by social networks to protect the data are easily breakable by the attackers. In addition to that, viruses, spywares and worms are constantly threatening social networks. For instance the online conversation made by a user is not a transient. This conversation could be visible to others. It may also be recorded somewhere in the network. Geo location services are also offered by some SNS. In spite of its help to society, it may be harmful if the information reaches the hands of anti-socials.

Considerable time and resources are always spent by social networks in order to maintain privacy of their users. Identity theft is a single attack that could make every user vulnerable to security related issues in SNS.

1.3.2 Access Control

Some social networking websites allow the user to access information at any time without assigning any restrictions. But, some social networks refuse the access to any form of information without authentication from the owner. Problems regarding information access could be completely controlled by the user but unauthorized access could still happen especially for the novice users of Social Network Site.

1.3.3 Notification of Updation

Every social network provides real time notification usually through email if there any changes happen in the user’s profile. Most of these notifications however are limited. For example, when a request to connect to a site is made, the user will then automatically be notified through email or
The social networks will never inform the user if something has gone wrong. In many cases it is deliberately done.

1.3.4 Misuse of Social Networks

The intruder may use social network for illegal purposes. The reason for thefts of information could be many. Since in SNS user’s profile provide the personal information of the user like phone number, address, photos taken on special occasion of their life etc., This clearly explain that most of the theft in SNS aims at hacking of personal information.

1.4 MOTIVATION FOR RESEARCH WORK

Apart from security intensive adult user groups within an SNS, the network should also be useful in a controlled and open manner to educate children along with parents and teachers. However, since it is often easy to become someone’s friend under false pretences, the protection of personal data may not be assured fully which is stated by Doug and Shiva Naidu (2009). Therefore, it will become necessary to encourage security conscious development practices and policy. Hence, Doug and Shiva Naidu (2009) suggest that a stronger authentication and access-control may need to be provided. Another problem on usability that depress most users of SNS is login procedures in an SNS. When users were first logged into their account (provided with dummy account), most of them would enter their information in the “sign up” section and not in the “login” section of the page (Brankovic and Estivill Castro 1999). This can be the cause of the design of the page. The actual “login” may not be designed for drawing the attention of the user unlike the “sign up” procedures. From these debates, two important inferences could be drawn, i) Importance of ‘Usability’ in SNS and ii) Importance of ‘Data security’ in SNS, particularly in restricted user forums of SNS.
Usability is a significant reason for many users not returning to use SNS. The usability problems include complex login procedures, confusing terminologies, inadequate feedbacks, error messages and improper links as per the statement of Brankovic and Estivill Castro (1999).

Restricted users in SNS can quickly share photos, videos, and communicate to connections via another SNS. Owing to its socially usable nature, usability apart from security plays an important role in SNS.

Therefore, creation of private and restricted user forums within SNS, where protection of individual personal information is guaranteed by SNS is required. When the security issue is brought to the centre stage, the usability is affected and vice-versa. It is therefore important to find the right balance between security and usability (Helen and Ljiljana 2008). As restricted user forums within SNS attract more regional users, security and usability aspects are needed to be determined through local social surveys. This is a very important motivating factor for the proposed research.

There is an increasing public concern about the individuals' privacy (Brankovic and Estivill Castro 1999). Privacy is normally considered as the right of individuals to control information about them. There seems to be general privacy issues: secondary use of the personal information, handling misinformation, and granulated access to personal information. They demonstrate that existing privacy laws and policies are well behind the developments in technology, and no longer offer adequate protection. It is therefore clear that both the users of restricted forums of SNS as well privacy laws need to concentrate on local issues. In the view of the above, the motivating factors for the present research is summarized below,
1. There are threats to users of SNS in recent years. Traditional attacks still work. Most attackers filch the secrets of users. (Helen and Ljiljana 2008). It is identified that there is a need of Security Model.

2. Assessing ‘Usability’ for SNSs of local users (of restricted forums) is very vital (Doug and Shiva Naidu 2009).

3. It is important to find the right balance between ‘Security’ and ‘Usability’ particularly in (restricted forums of) SNS (Weimin et al 2009).

1.5 THESIS ORGANIZATION

The contents of different chapters in the thesis are briefly described below.

Chapter 1 presents the definition and the contents of Social Network Sites, and the ways in which it can be made useful to the people in various forms. Issues in Social Network Site is also discussed briefly. Through discussions the motivation for the research work is summarized.

Chapter 2 describes the literature reviewed. The major security risks which are identified as a threat is highlighted. The need for security model for SNS is projected. The literature in the Existing Authentication mechanisms is reviewed.

Chapter 3 deals with the prerequisite definitions which could help the reader to understand the research in a nutshell. Empirical weightage values for research parameters are derived and discussed.
Chapter 4 to arrive at weightage values for the various authentication mechanisms, their pros and cons are discussed. The various levels are identified in each mechanism and the analytical study based on empirical values is presented.

Chapter 5 deals with three security models that are being proposed for SNS. The first one being two way password and personalized question based authentication model to update the user profile of SNS users. Three way signature based authentication model is suggested to establish a peer to peer communication between the friend or network of restricted forums of SNS. Distributed contributory authentication model is then suggested to maintain security and privacy in secret groups of SNS.

Since the research focuses on the security as well as the usability aspects of SNS, the validation of the proposed models would be performed in two ways. Technical validation and social validations are deliberated in the chapter 5.

Chapter 6 presents the conclusions derived out of the present research and also presents the future enhancement of research.