The Challenge of Usability Evaluation of Online Social Networks with a Focus on Facebook

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ABSTRACT

In today’s era online social networks are getting extensive popularity among internet users. People are using online social networks for different purposes like sharing information, chatting with friends, family and planning to hang out. It is then no surprise that online social network should be easy to use and easily understandable. Previously many researchers have evaluated different online social networks but there is no such study which addresses usability concerns about online social network with a focus on Facebook on an academic level (using students as subjects).

The main rationale behind this study is to find out efficiency of different usability testing techniques from social network’s point of view, with a focus on Facebook, and issues related to usability. To conduct this research, we have adopted the combination of both qualitative and quantitative approach. Graduate students from BTH have participated in usability tests.

Our findings are that although think aloud is more efficient then remote testing, but this difference is not very significant. We found from survey that different usability issues are in Facebook profile, media, Picture Tagging, Chatting etc.

Keywords: Usability Issues, Usability Evaluation, Online social networks (Facebook), Usability Testing.
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SECTION 1- OVERVIEW

Chapter 1: Introduction
1 INTRODUCTION

In this chapter we present a brief overview of this thesis. In section 1.1 we describe background. Motivation of thesis is described in Section 1.2 where we discuss aims and objectives of the thesis.
These days World Wide Web has gained immense popularity because it provides different kind of services and applications to facilitate internet users. Online social networks is one of them where people meet for different purposes such as to find the people with similar interest, to play games, join groups for discussion and to hang-out with others.

Online social gatherings are known by different names like ‘online communities’, social networks etc. Software development organizations are paying an increasing attention to the usability of such social communities; however the majority of them still have low usability (Liu, 2008). The main intention behind the use of usability evaluation on social networks is to focus on the people to make such networks useful and also make easiness for the people to achieve their objectives easily. Usability evaluation can be described as "systematical process of collecting data, in order to have a better understanding of users and how user groups use the product to perform a specific task under specified conditions" (Liu, 2008).

From social network’s point of view we have applied different usability testing techniques in order to investigate the efficiency of few usability techniques which is the main purpose of this study. In addition usability issues in Facebook are discussed. Facebook is the most popular social network in the world, which contain more than 350 million active members (Facebook, 2009). We also describe the importance of usability of social networks in current technological era.

1.1 Motivation

Social communities have become enormously popular in the last few years. This rapid increase in such networks induces the need for appropriate methodologies, techniques, and tools for developing applications that meet the desired quality requirements (Conallen, 2000). From industry and academia many different techniques and methods are proposed for the development of web applications (Ceri et al., 2000). In order to achieve good quality attributes, such as usability many proposals are modified (Cloyd, 2001). While there are several techniques for development of such web communities, there is also a need to test the key development processes of these applications that considerably impact the quality of such application, with for example methods of Verification & Validation (V&V), and quality assurance (QA) (Lucca et al., 2002).

1.2 Background

In 1989 the World Wide Web Project was initiated by the CERN Organization. Later it was launched in 1994 as a simple distributed system used for information sharing (Ingram, 1995). Initially World Wide Web was being used only for information retrieval on the Internet. Soon the World Wide Web became very popular among the people and only in the period of five years its users increased from 1 million to 25 million (Kobayashi and Takeda, 2000). Its popularity increases within couple of years with the invention of new functionality such as “links to other documents” and it starts growing rapidly with the invention of media types like “images”, “sounds”, and “movies”.

In April, 1998 an organization named MIDS (Matrix Information and Directory Services) estimated that there were 57 million users on the Internet worldwide and it will reach to 377 million at the end of 2000 (Kobayashi and Takeda, 2000). Morgan Stanley and Killen and Associates also gave the approximation about the internet users that was 150 million to 250 million in 2000 (Kobayashi and Takeda, 2000). These days World Wide Web is not only used for publishing documents but also used for creating social communities (Liu et al., 2004). Social networking opportunities have increased therefore we see many online social networking sites being launched. Now a day online advertising on social networks is growing rapidly and has become the most important business model connected to the social networks.
Because of the popularity of social networking web sites advertising companies are paying more attention in social communities, while these communities have drastically changed people interactions on the World Wide Web. Because of the popularity of social networks they need to have good quality.

Usability is a key issue in human-computer interaction (HCI) since it is the aspect that commonly refers to quality of the user interface (Parlangeli et al., 1999). Usability insures that the product is easy to learn, effective in use and interesting for the users (Sharp, 2002). Therefore usability of online social networks is an important characteristic to further investigate. Since there are many people accessing the online social networks every day therefore usability of these sites is one characteristic that would help retain the people on these sites.

Usability is a familiar term among the software developers. Several software engineering terms have different definitions according to the different authors; usability is also a software engineering term which does not have a single definition (Battleson et al., May 2001). Originally the term usability was derived from the word “user friendly” in recent times it is defined as a feature of a quality software (Battleson et al., May 2001).

Several techniques (think aloud, remote, heuristics etc) for usability testing have been developed by many different researches which differ from one another on the basis of importance and significance (Mack and Nielsen, 1993). Usability testing has numerous purposes or goals; its most important goal is to find out the main problems in the user interface. It also has other objectives such as to increase performance, efficiency, user satisfaction and also ensure that the system is easy to learn (Norman and Panizzi, 2006). Usability evaluation can of course be of any kind of software and we are interested in the usability of (online) website such as a social network’s website.

Usability evaluation is defined as

"systematical process of collecting data, in order to have a better understanding of users and how user groups use the product to perform a specific task under specified conditions"(Liu, 2008).

According to Nielsen Usability evaluation is used to find problems in user interface of system by using different methodologies (Nielsen, 1992b). Usability evaluation is a process by itself that involves numerous activities depending on the method employed (Ivory and Hearst, 2001). Its main concern is to collect information about the usability of a system, in order to evaluate it or to improve its interface by identifying problems and suggesting improvements (Shneiderman and Plaisant, 2005). Usability evaluation is commonly used in the development of software, particularly for evaluation of user interface designs (Skov and Stage, 2005).

Generally usability evaluation involves five activities such as determine; basics, plan process, create test situation, conduct test, interpret data (Skov and Stage, 2005). Commonly five steps are followed for creation of a website: Requirement gathering, Design, Development, Testing and Production. Previously usability evaluation was performed only on testing and production phase. If usability evaluation tests are performed from design stage then it could give better result in term of cost and performance (Liu, 2008).

To evaluate the usability of a system and to determine usability problems, it is important to select an appropriate usability testing technique (Ssemugabi and Villiers, 2007). Many different usability evaluation techniques have been proposed some of them are used frequently e.g. analytical, expert heuristic evaluation, survey, thinking aloud, remote testing, cognitive walkthrough, inspection, focus groups, interview, questionnaire observational, and experimental methods etc (Brinck et al., 2002) (Shneiderman and Plaisant, 2005). Every evaluation technique has different requirements; by applying
different evaluation techniques different usability problems could be identified. That is why many usability professionals often suggest using different evaluation techniques (Ivory and Hearst, 2001).

There is no fixed definition of the term ‘online community’, but it is defined by different people in line with their reasoning. According to Ellison et al social network sites are web-based services that permits its members to create a public or semi-public profile within a restricted system, maintain list about other members that are having connection with them and also can see and traverse the list (B. Ellison and M. Boyd, 2007). Rheingold express it as: “A virtual community is a group of people who may or may not meet one another face-to-face, and who exchange words and ideas through the mediation of computer bulletin boards and networks” (Rheingold, 1993). Morgan describe it as: “Any communication software that can be added to a web site is regarded as an online community” (Brinck et al., 2002).

The first social networking site classmates.com was launched in 1995 (Gaonjur, 2008). All online social networks before it were developed for specific group of people such as to share information with each other e.g. education, office communication etc where the members skills and platform was known. Later a panel of academics has identified the necessary functionalities of online social networks in a workshop that was held in 1996 (Whittaker et al., 1997). sixdegrees.com was launched in 1997 (B. Ellison and M. Boyd, 2007). It allowed its members not only to create profile, but also to list their friends. It attracted because of new functionalities, such as first time its members were able to see profiles of each other.

In 2000 sixdegrees.com was closed because it could not produce a sustainable business. Lunarstorm was launched as first Swedish online social network in 2000 (Skog, 2005). Two years later in 2002 Friendster.com emerged as popular online social network. Its exponential growth gave birth to new technical issues because its database servers could not handle rapid growth of this online social networks (B. Ellison and M. Boyd, 2007). At that time MySpace was launched in Santa Monica, California in 2003. One of the main reasons which make it famous among other online social networks was, that it started adding different features frequently based on user’s demand (Perkel, 2006).

After 2003 many new online social networks were introduced by different organizations and the analyst named Clay Shirky invented the term YASNS "yet another Social networking service" (Shirky, 2003). MySpace became famous in USA and also in some other countries; Friendster got popularity in the Pacific Islands; Orkut became the national online social network in Brazil and it also got fame in India; LunarStorm attained widespread adoption in Sweden; Mixi gained attention in Japan; Grono was adopted in Poland; Bebo was popular in the Australia, United Kingdom, and New Zealand and Hi5 got place in smaller countries like Latin America, South America, and Europe (B. Ellison and M. Boyd, 2007).

![Image of different online social networks]

Figure 1: Different Online Social Networks

In November, 2004 an undergraduate student of Harvard University, named Mark Zuckerberg has launched Facebook; the basic purpose of Facebook (Harvard-only) was to introduce a forum for interaction between university students and also for flow of information in college (Strater and Lipford, 2008). Initially to join Facebook, members were required to have a harvard.edu email address. In
September 2005, Facebook started to include other high school students, professionals belonging to other online social networks, and ultimately Facebook became the most popular online social networking site because of incredible increase in its members every month (B. Ellison and M. Boyd, 2007). Facebook facilitate its members with numerous features such as chat, sending message, pictures etc.

Facebook is not only popular among students but also among people without academic affiliations. Because of its popularity among the internet users we choose it to find out efficiency of usability testing techniques from social network’s point of view, for possible extension in usability testing techniques and to find out usability issues in Facebook.

Now since usability of online social networks is of particular importance therefore our thesis aims to explore online social network’s (Facebook) usability issues. Online social network should ideally be easy in use and not to contain issues related to usability. We have selected think aloud protocol and remote testing technique for usability testing to identify the efficiency that which technique is more efficient from social network point of view.
SECTION 2- LITERATURE REVIEW

Chapter 2: Problem Definition
Chapter 3: Research Methodology
Chapter 4: Usability and Social Networks
Chapter 5: Facebook
2 PROBLEM DEFINITION

Importance of Online Social Networks is given in section 2.1. Aims and objectives are discussed in section 2.2. Research questions are given in section 2.3. Section 2.4 describes goal/ result whereas expected out of this thesis is given in 2.5.
2.1 Importance of Online Social Networks

In today's technological era, online social communities are very common among the internet users. These online Social networks are used for several purposes such as information sharing, to keep in touch with friends other than that these online Social networks are also a good source of entertainment for any kind of persons irrespective of age, culture and interest. Such entertaining services include making friends, joining different groups, playing online games, chatting, offline messaging, sharing of videos and photos etc. Searching people of their interest for dating, hobby related hookups are also common on online Social networks.

One of the most prominent feature that some of such online Social networks offer is that members can make groups, such groups could be used for family, religious or supports activities .These online Social networks have played very important role in general election that was held in USA in 2008 (Robertson et al., 2009). Such networks are also getting popularity because of business advertisement from different multinational companies around the world. The increasing popularity of online social networks attracted the attention of academic and industry researchers (B. Ellison and M. Boyd, 2007).

In 1960s and 1970s the main purpose of software developers was to develop software with maximum possible functionality. Those software were only developed to accomplish the needs of very limited and specific number of trained users, but with the passage of time people demanded more functionality which gave birth to different issues, usability is one such issue which is grown to be very important (Preece, 2001b). Since the popularity of online Social networks increasing every day, as they entertain and engage their members yet not sufficient work has been done about evaluating the success of these online social network (Brandtz et al., 2007).

Like other web based applications online Social networks also face usability issues (Preece, 2001b). Poor usability not only waste time but also causes worry and frustration for people (Preece, 2001a). The usability issues for online Social networks and web based software are similar to each other (Preece, 2001b). Good usability of software provides high productivity, make it easy to learn and also free of errors. HCI researcher and developers are facing the challenges of improving usability of products from more than 25 years (Preece, 2001b).

According to Whitehand and Solman, Poor usability leads most of the development project to failure. Those occurs because of two reasons; first is that user requirements are not fully identified, secondly software users are not involved in the project (Whitehand and Solman, 2001). Usability can be beneficial from producer point of view in different way such as costs, support, competition and quality; it can also be beneficial from user’s point of view such as training, support, satisfaction, productivity, reduce time, easiness, efficiency, effectiveness and saving time (Whitehand and Solman, 2001).

In this thesis we will evaluate online social network (Facebook) to find out efficiency of different usability testing techniques from social network’s point of view, possible extension of usability testing techniques and also to find out usability issues in Facebook. We are going to conduct this study because we observe that not much work has been done on usability evaluation at academic level on social networks while a number of studies are presented by researcher but on industrial level. It is expected that this research work will also help to learn more about usability concerns from research point of view.
2.2 Research Question

Following research question will be addressed during this research work.

1. What are the usability issues in social networks (Facebook)?
2. What is the efficiency of usability evaluation techniques from a social network’s point of view?
3. What are the possible improvements in the existing usability evaluation techniques from social network points of view?

2.3 Goal/Results

In this research project we will identify usability issues in Facebook from social network point of view which are commonly mentioned in the literature. We will also conduct usability test and Questionnaire. The main focus of this research project is to find out the efficiency of few usability testing techniques from social network’s point of view and find out possible extension or improvements in usability testing techniques.

2.4 Expected Outcomes

Following are the expected outcomes

- List of usability problem in social networks with focus on Facebook
- Experiment result in form of table and graph that investigate the efficiency of usability evaluation techniques from social network’s point of view
- List of recommendation to improve the usability of social networks
3 RESEARCH METHODOLOGY

This chapter is regarding research methodology adopted for the thesis. An overview is given in section 3.1, literature review is described in section 3.2 and in section 3.3 we discussed pilot study. Section 3.4 contains introduction to usability test. Post-test questionnaire is described in 3.5 Section 3.6 gives description about interview.
3.1 Research Methodology Overview

Mixed research methodology both qualitative and quantitative approach was adopted for the proposed research (F Punch, 2005). The proposed study was conducted in various phases. In initial phase, authors thoroughly review the literature for different purposes such as usability, usability testing, usability evaluation, social networks, Facebook, interactive interface, different functions, interactive design concept and different principle of usability. In order to select the most effective technique for usability testing and evaluation, different research article, books and journals were studied. Usability is difficult to measure so think aloud protocol allows us to document people experience more clearly. Members of social networks are spread over time and place therefore these usability testing techniques is a suitable techniques.

After in depth study, thinking aloud protocol (Adebesin et al., 2009, J and R, 2001, Guan et al., 2006) and remote testing technique (Petrie et al., 2006, Huang et al., 2009, Breakwell et al., 2006) were selected for usability testing of online social network (Facebook). Questionnaire was designed and forwarded to different countries, for the purpose to collect data form students. In literature different types of research method are available such as interview, case study, analysis of record and questionnaire etc. Different kinds of methods and techniques are used in research operation i.e. data analysis, data collection and statistical processing.

![Figure 2: Overview of Research Methodology](image-url)
3.2 Literature Review

In the primary phase of this research, detailed literature review is conducted in order to know about usability evaluation and online social network (Facebook). We study about usability, usability testing, usability testing techniques and social network (Facebook). We adopt a systematic method in order to search the relevant published material.

We thoroughly search the study martial through ELIN (BTH Electronic library Information Navigator Ronneby, Sweden) as a database search engine to seek the literature; related to the proposed research. We also got a lot of useful study martial for study through relevant journals and conference papers and for this purpose relevant literature of last few years was studied and checked thoroughly.

We thoroughly search variant database like ACM, IEEE etc and found some important journals, research report and eBooks related to usability, usability testing, usability evaluation techniques and online social networks. Google and Google scholar are utilized and different eBooks and articles are founded related to the subject area. Different researchers are contacted by email and some useful research papers are provided by them.

![Figure 3: Literature Review](image)

3.3. Piloting the Usability Test

Before starting the main usability test, we have decided to conduct a pilot study on a small scale before main usability test. To understand pilot study we have study different articles. We have conducted pilot study on small scale to find out potential errors in the tasks design. We have designed the usability test tasks at the end of pilot study. We have conducted pilot study on 2 students to eliminate ambiguous steps from the design tasks. After conduction of pilot study usability test tasks were redesigned for actual usability test.
3.4. Usability Test

Once we have finished the literature review and pilot study, Test tasks were designed to be able to evaluate some aspect of the social network Facebook in a better way. Think aloud protocol is best for usability testing of software and it is extremely popular within the testing community (F Punch, 2005). In think aloud protocol only one evaluator and few numbers of test participants can perform the test (Hom, 2009). Remote testing eliminates travelling charges because participants and testers are separated from each other with respect to time and place; it saves time and also it is cost effective technique (Dray and Siegel, 2004). According to J.Hom only 5 participants and 1 evaluator is enough for remote testing (Hom, 2009).

Six test tasks were designed for evaluation of online social network of chosen aspect of Facebook. We have decided to conduct a small scale pilot study before main usability test. Usability test was conducted into two different phases. In the first, eight students took part in usability test; think aloud protocol was selected for first phase. In remote testing, where eight students have participated in usability test of online social network Facebook. We have participated in the usability test as observer and noted down different types of observations. We have also recorded the conversations of test participants during usability test for analysis purpose.

![Figure 4: Usability Test Conduction](image-url)
3.5 Questionnaire

Questionnaire is comparatively fast to collect information in an easy and better way. Questionnaire is written in several ways, also used in different situations. The main intention of questionnaire is to collect different types of data (Brace, 2008). The core advantage of questionnaire is that it is cost effective, simple and evaluator examines different type of issues related to usability by user’s point of view. Another advantage is that a Reliable comparison can also be made by the data collected through questionnaire (Breakwell et al., 2006). According to (Breakwell et al., 2006) completely perfect designing of questionnaire is perhaps not possible. It is suitable to pilot the questionnaire before questionnaire send to different people (Brace, 2008).

Following is the significance of using questionnaires from a social networks point of view

1. In addition to different testing techniques, a questionnaire helps to provide another set of data to analyze the usability aspects of online social networks.
2. The social and people-centric issues are more likely to be exposed using a questionnaire since they can express their answers in a relative degree of freedom.

Questionnaire is also very important in getting information about a relevant project. In this regard questionnaire were prepared and forwarded to students of different countries i.e. Pakistan, Sweden, USA, Canada, and Denmark and given to all those participants who participated in usability test.

There are three types of electronic questionnaire

i. Email Questionnaire
ii. Email invitation link to URL
iii. Questionnaire on the web pages

There are two types of questionnaire design methods

i. Open ended questionnaire
ii. Closed ended questionnaire
Usability and Social Networks in Literature is discussed in section 4.1. Importance of usability is discussed in section 4.2. Section 4.3 describes what usability is. In section 4.4 we discussed social network. Different kinds of usability testing techniques and usability are in section 4.5.
**4.1 Usability and Social Networks in Literature**

Usability is a familiar term among the software developers. Several software engineering terms have different definitions according to the different authors; usability is also a software engineering term which does not have a single definition (Battleson et al., May 2001). Originally the term usability was derived from the word “user friendly”, in recent times it is defined as a feature of a quality software (Battleson et al., May 2001). There are several standard definitions of the term usability according to ISO Standard usability can be defined as in table 1

<table>
<thead>
<tr>
<th>Definitions Of Usability According To ISO Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>“It is the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in specified context of use”. (ISO 9241-11: 1998)</td>
</tr>
<tr>
<td>“The capability of the software product to be understood learned, used and attractive to the user, when used under specified conditions.”(ISO/IEC 9126-1, 2000)</td>
</tr>
<tr>
<td>“The ease with which a user can learn to operate, prepares inputs for, and interprets outputs of a system or component.” (IEEE Std.610.12-1990)</td>
</tr>
</tbody>
</table>

Shackel one of the pioneers in field of usability has identified the importance of usability engineering and also the concept of usability in 1991 (Shackel, 1991). He defined usability as: “The usability of a system is the capability in human functional terms to be used easily and effectively by the specified range of users, given specified training and user support, to fulfill the specified range of tasks, within the specified range of scenarios”. In 1993, Nielsen also recognized the importance of usability (Nielsen, 1992b). He defined usability as “usability is about learnability, efficiency, memorability, errors, and satisfaction” (Jokela et al., 2003).

**4.2 Importance of Usability**

Over time frequent change in technology became stressful for people, most often developers keeps focus on developing newest products irrespective of products end user’s interests and needs. Most often product users are not part of development process which creates difficulty for the developers to fulfill the user’s expectations. So the main intention of developers should be to develop user-centered products in order to fulfill the expectations of product user’s.

Modern Software development lifecycle is divided into different stages, in earlier times usability testing was performed late in the software development lifecycle, from the last decade usability testing has become the vital part of development stages particularly for web-based applications (Shneiderman and Plaisant, 2005). In traditional development process product end users are not involved in development stages, by involving end users in development process developers can make product better (Folmer and Bosch, 2004). Usability testing plays a vital role to ensure that the interface design meet the needs of end users.

Dix et al. states that usability evaluation helps to “assess our designs and test our systems to ensure that they actually behave as we expect and meet the requirements of the user” (Dix et al., 1998). Nielsen describes it as, "Usability rules the Web. Simply stated, if the customer can't find a product, then he or she will not buy it" (Nielsen, 2000). About Dickstein and Mills, eight to twelve people are enough to determine web site usability (Dickstein and Mills, 2000).
Usability testing has become a vital part in software development lifecycle (Dix et al., 2004). Many different procedures and methods for usability testing have been developed and convinced by many different researches which differ from one another on the basis of significance (Mack and Nielsen, 1993). Usability testing has numerous purposes or goals; its most important goal is to find out the main problems in the interface of software product. It also has other objectives such as to increase performance, efficiency, user satisfaction and also ensure that the system is easy to learn (Norman and Panizzi, 2006).

The software engineering community ISO 9126 has related usability with the design of interface. In order to measure the usability of software there are different standards according to its definition. Our concern with usability is to evaluate the usability of online social network. Usability is evaluated by measuring products end user’s performance issues; most usability issues are only discovered late in the development process, during testing and deployment (Battleson et al., May 2001). Usability evaluation is defined as "systematical process of collecting data, in order to have a better understanding of users and how user groups use the product to perform a specific task under specified conditions" (Liu, 2008).

4.3 What is usability?

Usability is defined as “The extent to which a product can be used by specified product users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use” (Bevan, 1995). Five attribute of usability as defined by Nielsen (Nielsen, 1993) as given in figure 5.

4.3.1 Efficiency

Efficiency can be described as how quickly system user can perform a task accurately and correctly after the system user learnt the basic operation (Winschiers and Fendler, 2007). Once the system users learn how to use the system, high productivity is expected, so efficiency is related to systems performance (Minati et al., 2006).

![Figure 5: Five Attribute of Usability](image-url)
4.3.2 Learnability

Learnability has been used as an aspect of software usability back in 1976 (Grossman et al., 2009). It got fame as important aspect of usability in mid 1990’s (Dix et al., 2004). Learnability is among the important aspects of usability (Abran et al., 2003). Different definitions of learnability are available in literature (Petrie et al., 2006) (Shneiderman and Plaisant, 2005) (Holzinger, 2005) (Winschiers and Fendler, 2007). Michelsen et al. defined learnability as: “The system should be easy to learn by the class of users for whom it is intended” in 1980 (Michelsen et al., 1980).

4.3.3 Errors

A good system should have low rate of errors that helps system users to face few mistakes while using the system. When the system users make mistakes or any error occurs, the recovery from mistakes or errors should be easy, and ensures that Catastrophic errors should not occur (Folmer and Bosch, 2004).

4.3.4 Memorability

The concept of memorability states that the system should be easy to remember as human memory is temporally limited with a short-term capacity of around seven plus or minus two items (Yan et al., 2000). For system users if they return to the system after some time and they do not use the system during that time, they don’t have to learn the whole system again (Folmer and Bosch, 2004).

4.3.5 Satisfaction

The system should be satisfying in use; that is it should fulfill the requirements of system users when they use it (Folmer and Bosch, 2004).

4.4 What is Social Network?

The term ‘community’ is derived from two Latin words the trisyllabic comunete that is used as ‘common fellowship or society’ and 4-syllabic co (m) munite which is used as ‘fellowship’ (Plant, 2004). It was also used as common focus i.e., ‘community of interest’ (Simpson and Weiner, 2000). Online social community can be defined as “a collective group of entities, individuals or organizations that come together either temporarily or permanently through an electronic medium to interact in a common problem or interest space” (Plant, 2004).

Online social networks have become enormously popular in the last few years. These online social networks have played very important role in general election that was held in USA in 2008 (Bevan, 1995). Such networks become the online public place for internet users (Bevan, 1995).

Smith & Raine’s anticipated that internet users have social networking profiles are 30% of internet total users (Bevan, 1995). 59% of young adults and 87% of students are using online social networks (Schrammel et al., 2009). Online social networks are very important for a healthy public environment. The benefits of such communities are to reduce misbehavior and to build a type of social capital (Lampe et al., 2007). In online social networks it is the responsibility of community member to decide what information he/she wants to make available to others by using privacy settings one can protect any personal information (Strater and Lipford, 2008).

In order to be a part of any online social network members need to get register with that online social network and registration process requires that members disclose their personal information (Palen and Dourish, 2003). Members are provided with different facilities such as profile space, uploading media
contents, connection with other members and also they can write message on the wall of their friends. The main use of social networks is to keep in touch with old friends (Joinson, 2008).

4.5 Usability Testing and Evaluation Techniques

Usability testing techniques are applied to ensure whether a web site is usable or not by identifying usability problems. To evaluate the usability of a system and to determine usability problems, it is important to select an appropriate testing technique (Semugabi and Villiers, 2007). A wide range of usability testing techniques has been proposed some of them are used frequently, e.g. analytical, expert heuristic evaluation, survey, observational, and experimental methods etc (Brinck et al., 2002) (Shneiderman and Plaisant, 2005).

These testing techniques follow the set of activities; In general usability testing techniques are divided into three classes such as Inquiry, Inspection and Testing (Battleson et al., May 2001) (Hom, 2009). Inquiry contains six different types of techniques (Field Observation, Focus Group, Interviews, Logging Actual Use, Proactive Field Study and Questionnaire), Inspection contains five techniques (Cognitive Walkthroughs, Feature Inspection, Heuristic Evaluation, Pluralistic Walkthrough and Perspective-based Inspection), There are nine different kinds of techniques in testing (Coaching Method, Co-discovery Method, Performance Method, Question-asking protocol, Remote testing, Retrospective testing, Shadowing testing, Teaching method and Thinking aloud protocol) (Ivory and Hearst, 2001).

Some of these usability testing techniques can be applied in the early stages of software development lifecycle e.g. heuristic evaluation and some of them can be applied only after the implementation of interface design formal user testing is one such example.

Every testing technique has different requirements; by applying different testing techniques different usability problems could be identified. That is why many usability professionals often suggests using different testing techniques (Ivory and Hearst, 2001). To choose which testing technique to employ depends on the strengths and weaknesses of that technique, also its applicability with regards to the researcher’s objectives.

4.5.1 Thinking Aloud Protocol

In 1940, think-aloud testing technique was originated by a German psychologist named Duncker who worked in the department of experimental psychology at Cambridge University (Boren and Ramey, 2000) (Edwards and Benedy, 2007). Ericsson and Simon also justify the work of Duncker (Ericsson and Herbert, 1984) (Nielsen et al., 2002). As Jakob Nielsen mentioned “Thinking aloud may be the single most valuable usability engineering method” (Nielsen, 1993).

Think-aloud testing technique is extensively used for usability evaluation of different software (Vredenburg et al., 2002) (Sayago and Blat, 2006). It has been the most important technique of usability testing to check the user experience about the product or interface (Carter, 2007). Think-aloud testing technique was designed to capture the contents of short-term memory (Boren and Ramey, 2000) (J and R, 2001).

In think aloud testing technique a set of practical tasks are given to the test participants, test participants perform those tasks on the system that is being evaluated. While performing the tasks whatever participants think, expect or feel about the system, they have to verbalize it aloud continuously (Dumas, 2003, Hornb et al., 2008) (Adebesin et al., 2009), this practice helps usability professionals to understand actions of participants, explain misconception participants face in the system and also in usability data collection (Boren and Ramey, 2000).
It is extremely important to specify system users when performing think aloud test because system users play vital role in usability evaluation (Hornb et al., 2008). Think-aloud testing technique has been widely used in cognitive science and (HCI) human-computer interaction (Guan et al., 2006). Post-task interview can be used as alternative to think-aloud testing, in post-task a short set of questions are asked to system users, from (Baauw and Markopoulous, 2004) the comparison between Think aloud, post-task interview and written questionnaires have shown that Think aloud test helps to discover more problems than post-task interview and written questionnaires. The advantage of think-aloud test is that test-participants may volatile their memory after the usability test performed (Baauw and Markopoulous, 2004).

In usability testing process, involvement of system users is extremely important, when system users are highly involved in the evaluation process for instance being asked to think-aloud, or in other case when they are not highly involve in that case they only have to achieve the objective according to the instructions given to them, both methods are famous among the testing community.

According to J.Hom, think-aloud testing can be applied on different stages of development like: design, code, deployment and test (Hom, 2009). Usually one usability expert and four participants are required for usability testing also think aloud covers only two usability issues that is effectiveness and satisfaction but not efficiency (Hom, 2009).

4.5.2 Heuristic evaluation

Nielsen originated the heuristic evaluation technique, Nielsen and Molich laid the foundation of ten basic principles known as heuristics for heuristic evaluation in 1990 (Nielsen and Mack, 1994). A group of professionals follow these principles ‘heuristics’ defined in (Nielsen 2005) to identity usability problems in the system (Dix et al., 2004). “Heuristic evaluation is a systematic inspection of a user interface to examine if the design is in compliance with recognized usability” (Blandford et al., 2004).

Nielsen also described that usability professionals give better results than non professions in a study conducted on heuristic evaluation (Nielsen, 1992a). He also stated that heuristic evaluation gives efficient results when performed on operational systems. Desurvire observed that by using heuristic evaluation usability professionals not only discover problems in systems interface but also recommend the improvements in the system (Heather and J. C, 1993) (Kan Peng et al., 2004).

The disadvantage of heuristic evaluation is that an expert evaluator is mandatory as recommended by Nielsen; another disadvantage is that several experts are required. According to J.Hom, Heuristic Evaluation can be applied on different stages of development like: design, code, deployment and test (Hom, 2009). Usually four usability experts required for usability evaluation also Heuristic Evaluation covers only two usability issues that is effectiveness and efficiency but not satisfaction (Hom, 2009).

4.5.3 Cognitive Walkthrough

Cognitive Walkthrough is well structured approach; it gives narrow range of usability problems (Wharton et al., 1994). The main focus of Cognitive Walkthrough is on goals of system users and their learning ability (Drury, 2000). Cognitive Walkthrough has not been adopted regularly by commercial software developers (Spencer, 2000).

The most important rationale behind Cognitive Walkthrough is to predict that how easy the system will be in use, it is accomplished by usability experts who interpret and apply the details of user’s
characteristics (Gabrielli et al., 2005). Nielsen also states that Cognitive Walkthrough can be applied on any stage of development process (Nielsen and Mack, 1994).

Cognitive Walkthrough proved to be time consuming when applied to test complex systems, since it is specific for new users of system which prove its limitations (Gabrielli et al., 2005). Also Cognitive Walkthrough provide limited range of problems raised during process (Hollingsed and G. Novick, 2007).

According to J.Hom Cognitive Walkthrough can be applied on different stages of development like: design, code, deployment and test (Hom, 2009). From 1 to 4 usability experts and 2 developers required for usability evaluation also Cognitive Walkthrough covers only one usability issue that is effectiveness but do not cover satisfaction and efficiency (Hom, 2009).

4.5.4 Remote usability

Remote usability testing was Introduce more than a decade ago. It became increasingly popular among the usability experts with the passage of time. Remote usability testing is used when usability experts and test participants reside in different time / places (Hom, 2009). Remote usability testing team send the material to the test participants, test participants perform test tasks within decided time, Participants are solicited to write down the problems they face during performing the tasks, these notes are then send to the usability experts.

Transportation cost for test participants or developers to remote locations may cause high expenses in traditional lab based testing. Transportation cost can be eliminated by using remote usability testing. Olson states that in remote usability testing results gathered by audio connection, log file, or videoconference are inexact as compared to traditional lab based testing also remote testing is time consuming (Olmsted and Gill, 2005). After the experiment Tullis and Fleischman concluded that remote participants discover more usability problems as compared the participants in lab (Tullis et al., 2002).

In traditional laboratory based testing it is difficult to reproduce the environment for test participants, by using remote testing test participants can be accessed in their natural environment (Vasalou et al., 2004). Another advantage of remote testing is that a single testing team can conduct the test. Numerous studies about remote usability testing are available as stated in (Scholtz, 2001) (Krauss, 2003), still insufficient work has been done on its application internationally. Remote usability testing is separated into two major categories, synchronous remote usability testing and asynchronous remote usability testing.

In synchronous remote usability testing both participants and test experts are located in different places, testing is conducted in real time. Synchronous remote testing is achieved by using video and audio connections along with remote desktop sharing (Dray and Siegel, 2004). In asynchronous remote testing, experts and participants both are separated with respect to time and place. Asynchronous evaluation techniques are time consuming more over in these techniques evaluator has no interaction with the participants during data collection and also it identify less usability problems as compared to synchronous evaluation techniques.

Remote evaluation is perceived to be less expensive than non remote testing as it eliminates the traveling charges to remote side, another advantage of remote usability testing is that participants are separated over time from each other which results in flexibility in scheduling. In remote usability testing distance of usability experts from the test participant’s results in few difficulties such as it becomes
difficult to judge nonverbal cues, body language and tone of voice. Such problems crop up even while doing video conference testing (Dray and Siegel, 2004).

According to J.Hom Remote usability testing can be applied on different stages of development like: design, code, deployment and test (Hom, 2009). One usability experts and five participants required for usability testing also Remote usability testing covers all three usability issues that is effectiveness, satisfaction and efficiency (Hom, 2009).

4.5.5 Coaching method

In coaching method participants are encouraged to ask system related questions to the coach, and coach respond with appropriate answer (Hom, 2009). More often the usability experts act as coach. Main rational behind this technique is to identify the user requirements to provide improved training and documentation and also to make necessary changes in the design to fulfill user requirements (Hom, 2009).

According to Coaching usability testing can be applied on different stages of development like: design, code, deployment and test (Hom, 2009). Its advantage is that users learn quickly also one usability experts and four participants are necessary for the testing (Hom, 2009). It covers only two usability issues that is effectiveness and satisfaction but do not cover efficiency (Hom, 2009).
This chapter is about Facebook. Section 5.1 is all about history of Facebook. We discussed the biggest network Facebook in section 5.2. Section 5.3 describe model of Facebook. Common features of Facebook are given in section 5.4. Task definition is in section 5.5 whereas issues in Facebook are given in section 5.6.
5.1 History of Facebook

In November, 2004 an undergraduate student of Harvard University, named Mark Zuckerberg has launched Facebook (Strater and Lipford, 2008). The basic purpose of Facebook (Harvard-only) was to introduce a forum for interaction between university students and also for flow of information in college (Strater and Lipford, 2008). In September 2005, Facebook started to include other high school students, professionals belonging to other online social networks. Initially to join Facebook, members were required to have a harvard.edu email address. After one month it introduced photo sharing feature that resulted in immense popularity of Facebook.

In September 2006 Facebook was opened for every one with required email address (Crunchbase, 2009). There were two main features that attracted other social networks members toward Facebook. First and the most important feature was that Facebook provides platform for application developers or companies that can develop application and can earn money and other feature is that Facebook users can’t make their profiles full public to all other members of Facebook. Ultimately Facebook became the most popular online social networking site because of incredible increase in its members every month (B. Ellison and M. Boyd, 2007). Anyone can sign up for Facebook and communicate more efficiently with their friends, family and coworkers in a trusted environment.

5.2 Biggest social network

Facebook is the biggest social network in the world, which contain more than 350 million active members (Facebook, 2009). Facebook members can make new networks within Facebook and can add new friends in those networks by inviting them. Facebook members can also send private message (s) to any other member (s) of Facebook, and they can write on the wall (public message) of their friends. Any Facebook member can also update his/her personal profile to notify his/her friends about him/her.

Additionally, members can join different networks organized by city, workplace, school, and regions. Members can also share information, news, blogs, media such as pictures, videos etc. Facebook provides platform for application developers. Third party developers can develop different kinds of applications and can earn money. Because of such features Facebook is getting popularity among the members of social networks.

Members of Facebook can make friends, they can also join different groups and they can make their own groups in Facebook. Each members or group is provided a “wall” in Facebook, friends and group members can post comments on “wall”. Facebook members can get emotional support by connecting with others or by using other facilities such as generate event, offer gift and play games. Facebook is available all over the world in 70 languages.

In USA 85% of undergraduate students have Facebook profile and it is increasing rapidly (Strater and Lipford, 2008). In July, 2007 number of Facebook members reached to 30 million and in a year it got increase of 89% (Joinson, 2008). In the UK Between November 2006 and May 2007 network of Facebook members grow by 500% (Nielsen, 2007).

In Dec, 2009 Facebook members were 350 million (Room, 2009). Facebook is not only popular among students but also among people without academic affiliations. Because of its popularity among the internet users we choose it for performing usability evaluation on it. A model of Facebook is given below in figure 6 where members are facilitated with numerous features such as chat, sending message, pictures etc.
5.3 Facebook Model

Figure 6: Facebook Model
As shown in figure 6 Facebook members can share information, news, pictures and videos. Members can also post offline message to any Facebook member and also members can send online messages (chat) only to their friends. Facebook members can send public messages only in the group they belong to or to their friends but they can send private messages to any Facebook members. Facebook members can create groups and can also join different groups based on common interest where they can share information, videos and pictures. Facebook provides a platform for companies and application developers. Companies and developers can develop and share applications and gain access to millions of Facebook members.

Facebook is playing central role for business promotions. Information that members provide in their profiles on Facebook is used to target ads not only on Facebook but across the web. Facebook members can control the information they want to share and with whom they want to share it. Also members can share and restrict information for specific friends. Facebook members are also required password for the security of member accounts. Also member can change their password any time they want.

![Facebook Member's Growth](Figure 7: Facebook Members Growth (Facebook))

### 5.4 Common Features of Facebook

- Facebook provide multiplatform for application developers and it is available in 70 different languages
- Facebook members can upload photos and video for sharing with their friends
- Facebook members can write on others wall and also they can chat with friends
- Members with same area of interest can create or join different groups
- Facebook members can also send public and private messages
- Games and different types of application are available for Facebook members
- Facebook also helps in promoting business by advertising adds on Facebook
5.5 Task Definition

We have designed 6 different tasks i.e. Create Group, Invite Friend(s), Send Message to your Friend, Create Album and Upload Picture(s), Upload Video and Write on the Wall of your friend. The designed tasks for usability testing have covered most common features of online social network (Facebook). These are the most commonly using feature now a day and online social network Facebook members spend most of their time by using these features.

5.6 Issues in Facebook

- Facebook’s Beacon feature is very frustrating for the members expectations (Chew et al., 2008). This feature enables third party websites like eBay or Blockbuster to insert events in the activity stream of Facebook members whenever members purchase something or add movie etc. For initial member it is not easy to control such events because members cannot avoid such events by following by default settings. In order to avoid such events they have to change their preferences and have to specify every particular website (Chew et al., 2008).
- Small fonts proved to be difficult for members as it was difficult for members to find "Settings" which is located at on the top on right hand corner (Fox and Naidu, 2009).
- Also it is very difficult to find chat link because chat icon was hidden in the right corner and also chat icon was very small (Fox and Naidu, 2009).
- Terms like “wall”, "Boxes" and "Live Feed" etc are difficult to understand for members. Facebook layout is also a problem the reason behind this issue is that color combination of test color and background color is worse (Fox and Naidu, 2009).
SECTION 3- USABILITY TEST

Chapter 6: Test Conduction
This chapter is regarding planning and conducting of usability test. Usability Test Conduction is given in section 6.1. We discussed selection participant method in section 6.2 and section 6.3 contain usability test environment. Section 6.4 describe pilot study of usability test whereas tasks definition is given is 6.5. Recording of the usability test tasks is in 6.6. Experiment tasks are given in section 6.7.
6.1 Usability Test Conduction

The main purpose of usability test is to investigate some important aspects of the online social network with the focus on Facebook in an effective way in order to give ground for evaluation of the aspects of social network’s possible improvements of evaluation techniques Facebook was selected.

Think aloud protocol (Adebesin et al., 2009, J and R, 2001, Guan et al., 2006) and remote testing (Petrie et al., 2006, Huang et al., 2009, Breakwell et al., 2006) techniques were selected on the basis of literature review.

We have decided to conduct usability test in two different ways. In start of usability testing, think aloud protocol was selected and then we choose remote testing technique. We have divided the usability test into two ways, we have decided that during usability test, participants are not allowed to put task description or demand any kind of help from the observer.

Table 2: Test Participants

<table>
<thead>
<tr>
<th>No</th>
<th>Test Participants</th>
<th>Think aloud protocol</th>
<th>Remote Testing</th>
<th>Department</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New Participants</td>
<td>2</td>
<td>2</td>
<td>Computer Science/ SE/ MBA</td>
<td>Male</td>
</tr>
<tr>
<td>2</td>
<td>Advance Participants</td>
<td>6</td>
<td>6</td>
<td>Computer Science/ SE/ MBA</td>
<td>Male</td>
</tr>
</tbody>
</table>

6.2 Test Conduction from Social Network’s Point of View

- We have selected a number of students to make a small social network.
- We selected think aloud protocol because it allows us to document user experience more easily and in better way.
- Remote testing was selected because of social network is online and members are separated by time and place.

6.3 Participant Selection Method

In usability test, 18 graduate students were selected from Blekinge Institute of Technology Ronneby, Sweden. We have decided to conduct a pilot study on a small scale. We conduct Pilot study on 2 students before a main usability test.

In the start of usability test, think aloud protocol was selected and usability test was performed on 8 students. Then remote testing was selected and 8 students have performed the usability test. For usability test students were chosen from different departments of Blekinge Institute of Technology, such as Computer Science, Software Engineering and Master of Business Administrator.

Two evaluators have participated in the test, one of them has observed the participants attitude and feelings while interacting with the system and second evaluator noted down whenever participants have made any mistake. The evaluators also started audio and video recording as participants started interacting with the system but this was done after the permission of test participants.
6.4 Test Environment for Usability Test

We have decided to conduct the usability test in the computer lab of Blekinge Institute of Technology Ronneby, Sweden. Usability test was conducted in peaceful and quite place according to the availability of students. The test environment was entirely natural i.e. neither fully controlled nor fully free. Before starting the usability test each test participant was provided Printed pages of usability tasks, computer systems with internet connection, four different web browsers i.e. Microsoft Internet Explorer (Version 7), Mozilla Firefox (Version 3), Google Chrome (Beta Version) and Apple Safari.

<table>
<thead>
<tr>
<th>Think aloud protocol</th>
<th>Remote Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of test participants</td>
<td>8</td>
</tr>
<tr>
<td>Age</td>
<td>25-35</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
</tr>
<tr>
<td>Department</td>
<td>CS, SE, MBA</td>
</tr>
<tr>
<td>Facebook experience</td>
<td>2-3 Years</td>
</tr>
<tr>
<td>Test environment</td>
<td>Library Room</td>
</tr>
<tr>
<td>System specification for test</td>
<td>2.0 GHz Processor, 1.6 GB Ram, Gateway, 120 GB hard disk.</td>
</tr>
<tr>
<td>Audio and Video Recording</td>
<td>Laptop Webcam, MIC</td>
</tr>
</tbody>
</table>

6.5 Task Recorded

Test participants were totally free throughout the usability test to express their opinion and thoughts. We also made note of following important information

1. Time spent to accomplish each task
   - We selected this in order to know the time spent by each test participants on any particular task
2. Problems / errors participants faced regarding usability
   - We selected this because we want to identify problems in online social network related to usability
3. Successfully accomplished tasks
   - We selected this to know how successfully test participants will complete the task.
   - How many tasks were successfully completed by test participants?
4. Uncompleted tasks and usability problems
   - We selected this to know how difficult it was for test participants to complete the task.
   - How many tasks were not completed by test participants?
6.6 Usability Test Conduction

The usability test of online social network (Facebook) was not carried out at any specific time or day. We have conducted the usability test on different times and days according to availability of students. During usability test each test participant was briefly informed regarding the purpose of usability test. We have adapted two different usability testing techniques Think Aloud Protocol and Remote Testing for performing usability test.

The main intention for using two different usability testing techniques was to find out the efficiency of different usability testing techniques from online social networks point of view and possible extension in usability testing techniques on the basis of this test. We gave a brief overview of the two usability testing techniques Think Aloud Protocol and Remote Testing and the purpose of usability experiment to the test participants. The introduction session took approximately 5-10 minutes in explaining the usability test to each test participant. The time limit for usability test was defined during the test.

Throughout the usability test of online social network (Facebook), we have participated in the test as an observer. We have written down the observations while participant were performing the tasks. We have also recorded audio and video of each test participant while performing test. We have noted down the starting time as participants started the usability test and stop the watch as participants end the test. Throughout the usability test if any test participants has stopped speaking, we reminded him that he has to speak loudly according the usability testing rules while performing the test.

In remote testing test participants and observers were separated by place from each other but at the same time. As an observer we were able to watch the computer screen of Test participants through “Skype Messenger and VodBurner application” as shown below in figure 8 and figure 9 respectively. These applications have enabled us to watch the computer screen of participants remotely. We use “Skype Messenger” for getting audio of test participants and video of his desktop also we use “VodBurner application” for recording the audio and video. At the end of usability test we have discussed the problems with the test participants that they face while performing the test.
6.7 Experiment Design Task

6.7.1 Task1 (Create Group)

1. Go to “Application setting” under setting option on the upper right side of the page
2. Click on “Groups” to create new group
3. Click on “+ Create a New Group” on the right side
4. Enter name of group in the “Group Name” text box
5. Enter description in the “Description” text box
6. Select Category in the “Group Type”
7. Select type from the “Select Type”
8. Enter news in the text box “Recent News”
9. Enter your office in the “Office”
10. Enter email address in the “Email” in the text box
11. Enter Street in the “Street” text box
12. Enter City/ Town in the “City/ Town” text box
13. Click on “Create Group”
14. Make further changes if you would like
15. Click on “Save”

6.7.2 Task2 (Invite Friends)

1. Go to “Invite Friends” under Friends option on the top
2. Write down Email address of your friend you want to invite in the “To” text box
3. Write down message in the “Message” text box
4. Click on “Invite” button below

6.7.3 Task3 (Send Message to your Friend)

1. Go to “All Friends” under Friends option on the top of the page
2. Select one of your friends from “Friends List” to whom you want to send message
3. Click on “Send Friend a Message” on the left side on the page
4. Write Email address “To” in the message box
5. Enter subject in the “Subject” text box
6. Write your message to your friend in “Message” text box
7. Click on “Send” below
6.7.4 Task 4 (Create Album and Upload Photos)

1. Go to “Application Setting” under setting option on the right side of the page
2. Click on “Photos” under Application Setting
3. Then click on “Create an Album” on the top of the right side of the page
4. Enter your album information such as “Name, Location and Description
5. Click on “Create Album” button
6. Browse your photos from your hard drive and click on “Select All” button
7. Click on “Upload” button
8. Enter your “Caption” in the Text box
9. Press “Save changes”
10. Click on “Publish” button

6.7.5 Task 5 (Upload Video)

1. Go to “Application Settings” under “Setting” on the right side of the page
2. Click on “Video” in the application setting
3. Click on “Upload” on the right side
4. Click on “Browse” button
5. Browse your video from your hard drive
6. Write title in the “Title”
7. Write description in the “Description”
8. Set your privacy setting in the “Privacy” option
9. Click on “Save Info” at the bottom

6.7.6 Task 6 (Write on Wall “Share Information with All Your Friends”)

1. Click on “What’s on your mind?” below of the “Live Feed”
2. Write massage in the “What’s on your mind?” on the top of the page
3. Click on “Share” button below

We briefly described the planning and conduction of usability test in this chapter and analyzed critically in the results and analysis chapter.
SECTION 4 - ANALYSIS

Chapter 7: Results and Analysis
Chapter 8: Discussion And Validation Assessment
7 RESULTS AND ANALYSIS

7.1 are about test participant. Experiment result of this thesis is given in 7.2. Observation of usability test is discussed in section 7.3. Section 7.4 is about work flow for usability test. Problems in usability test are mentioned in section 7.5. 7.6 contain analysis of usability experiment.

We compare result of both usability testing techniques in section 7.7. Section 7.8 is about efficient technique. Analysis of survey is in section 7.9. Patterns are discussed in section 7.10 whereas possible extension in usability testing technique is given in 7.11
7.1 Test Participants

18 students participated in usability test conduction. 8 students participated in think aloud test, same number of students participated in remote testing. All test students were selected from Blekinge Institute of Technology. We have selected 7 students from Computer Sciences, 6 from Software Engineering and 3 from Management Sciences departments.

We have divided usability test into two ways. Initially, we have selected think aloud testing technique and 8 students performed the test whereas 8 students have performed the test using remote testing technique. Both phases of test were conducted in BTH.

7.2 Experiment Results

In usability test, each test participant performed 6 tasks according to schedule and manual that was given to them. In both tests, we have participated as observers. In think aloud protocol; comments and opinions from different students were also recorded (Audio and Video) while performing each task of the test.

7.2.1 Think Aloud Test

Results of Think aloud tests are given below in table 4. We have denoted successful task with “S” and unsuccessful tasks with “U”. Time spent on each task and total time is also given it table 4

<table>
<thead>
<tr>
<th>Table 4: Usability Test Results of Think Aloud Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Think Aloud Protocol [Phase]</strong></td>
</tr>
<tr>
<td>Student ID</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Statistics of think aloud test is given in table 5

<table>
<thead>
<tr>
<th>Think Aloud Protocol</th>
<th>Task-1</th>
<th>Task-2</th>
<th>Task-3</th>
<th>Task-4</th>
<th>Task-5</th>
<th>Task-6</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Unsuccessful tasks</td>
<td>2/8</td>
<td>5/8</td>
<td>1/8</td>
<td>2/8</td>
<td>3/8</td>
<td>1/8</td>
<td>14/48</td>
<td>0.29</td>
</tr>
<tr>
<td>Percent Unsuccessful tasks</td>
<td>25%</td>
<td>63%</td>
<td>13%</td>
<td>25%</td>
<td>38%</td>
<td>13%</td>
<td>175/6</td>
<td>29%</td>
</tr>
<tr>
<td>Total Successful tasks</td>
<td>6/8</td>
<td>3/8</td>
<td>7/8</td>
<td>6/8</td>
<td>5/8</td>
<td>7/8</td>
<td>34/48</td>
<td>0.71</td>
</tr>
<tr>
<td>Percent Successful tasks</td>
<td>75%</td>
<td>38%</td>
<td>88%</td>
<td>75%</td>
<td>64%</td>
<td>88%</td>
<td>426/6</td>
<td>71%</td>
</tr>
<tr>
<td>Average time [Minutes/Seconds]</td>
<td>3.22</td>
<td>1.04</td>
<td>1.54</td>
<td>2.45</td>
<td>2.03</td>
<td>0.54</td>
<td>10.82</td>
<td>1.80</td>
</tr>
</tbody>
</table>

7.2.2 Remote Test

In remote testing, we have used Skype (Version 4.1) messenger and VodBurner (Version 1.0) application to remotely access user’s screen. Also we have recorded the audio, video and took screen shots of each student with the help of Skype and VodBurner. We have used Skype and VodBurner in remote testing because they are available on internet for free of cost. We choose Skype software for remote communication because it required less space on hard disk and also call from Skype to Skype is free.

We have selected VodBurner for audio and video recording. Most of the available software is not free of cost. Some of them are free of cost but they require credit card information. Skype and VodBurner are available free of cost.

Results of remote testing are given below in table 6. We have denoted successful task with “S” and unsuccessful tasks with “U”. Time spent on each task and total time is also given it table 6
Table 6: Usability Test Results of Remote Testing

<table>
<thead>
<tr>
<th>Student ID</th>
<th>Task-1</th>
<th>Task-2</th>
<th>Task-3</th>
<th>Task-4</th>
<th>Task-5</th>
<th>Task-6</th>
<th>Total Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>02.00</td>
<td>0.46</td>
<td>0.47</td>
<td>01.56</td>
<td>02.01</td>
<td>0.33</td>
<td>06.83</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>U</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>02.29</td>
<td>0.50</td>
<td>01.16</td>
<td>03.11</td>
<td>02.50</td>
<td>0.54</td>
<td>10.01</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>U</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>02.39</td>
<td>05.87</td>
<td>01.06</td>
<td>02.07</td>
<td>05.56</td>
<td>0.32</td>
<td>17.27</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>S</td>
<td>U</td>
<td>S</td>
<td>S</td>
<td>U</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>04.43</td>
<td>02.06</td>
<td>01.32</td>
<td>02.47</td>
<td>01.51</td>
<td>01.12</td>
<td>12.91</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>U</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>01.27</td>
<td>0.30</td>
<td>02.02</td>
<td>0.49</td>
<td>02.45</td>
<td>0.30</td>
<td>06.83</td>
</tr>
<tr>
<td></td>
<td>U</td>
<td>S</td>
<td>U</td>
<td>S</td>
<td>U</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>04.80</td>
<td>01.12</td>
<td>01.40</td>
<td>03.30</td>
<td>02.45</td>
<td>02.16</td>
<td>15.23</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>04.39</td>
<td>01.10</td>
<td>01.42</td>
<td>04.20</td>
<td>04.17</td>
<td>0.53</td>
<td>15.81</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>02.27</td>
<td>0.41</td>
<td>01.22</td>
<td>01.16</td>
<td>01.58</td>
<td>01.04</td>
<td>7.68</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>S</td>
<td>U</td>
<td>U</td>
<td>S</td>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>

Figure 9: Graphical Representation of Time spent on each task in Remote Testing
Statistics of Remote Testing is given in table 7

<table>
<thead>
<tr>
<th>Task-1</th>
<th>Task-2</th>
<th>Task-3</th>
<th>Task-4</th>
<th>Task-5</th>
<th>Task-6</th>
<th>Total</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>0/8</td>
<td>3/8</td>
<td>3/8</td>
<td>2/8</td>
<td>2/8</td>
<td>11/48</td>
<td>0.23</td>
</tr>
</tbody>
</table>

| Percent Unsuccessful tasks | 12.5% | 0% | 37.5% | 37.5% | 25% | 25% | 137.50/6 | 23% |
| Percent Successful tasks  | 87.5% | 100% | 62.5% | 62.5% | 75% | 75% | 462.50/6 | 77% |

| Total Time [Minutes/Seconds] | 23.84 | 11.82 | 10.07 | 18.36 | 22.23 | 6.34 | 92.66/6 | 15.44 |
| Average time [Minutes/Seconds] | 2.98 | 1.48 | 1.26 | 2.30 | 2.78 | 0.79 | 11.59 | 1.93 |

7.3 Usability Test Observation

7.3.1 Think Aloud and Remote Testing

We have observed the test participants during usability testing and wrote down the observations. We have also noted down the time spent on each task, problems faced by test participants in each step of tasks, task completion (successful/unsuccesful) and facial expressions of participants (relax/confuse) in think aloud protocol and remote testing.

7.4 Work flow for Usability Test

Tasks description refers to Facebook model which is given in figure 6 of chapter 5. We also mentioned a step by step description of each task for successfully completion which is given in Chapter 6, section 6.7. Criteria for Measurement/Assessment of tasks completion is given below in figure 10

![Figure 10: Criteria for Measurement/Assessment of tasks completion](image-url)
Complete task step should be followed
Complete and identified steps of usability techniques (Think aloud protocol and remote testing) should be followed by students
The identified tasks should be actually performed (Group Creation, Invitation etc)
Maximum number of errors identified during performing the task

7.5 Problems in Usability Test

In both phases of test participants face problems that are listed below.

Task-1:
First task that every student performed during test was to Create Group. Every student had to perform fifteen steps in order to accomplish first task. Steps were mentioned in the document that was given to them. In both phases of test students faced difficulty in finding group. In first phase of test 25% student could not complete task 1 and in second phase 13% student could not complete. We noted down one common problem that mostly students faced in both phases, it was difficult to find out group and even the experienced students of Facebook feel difficulty in group creation.

Beside these issues, there were some other issues faced which were outside the scope of usability evaluation but we are listing them below of each task in quotes to better understand the context.

Important Observation beside of measurement/ Assessment
- “I need help in start“
- “You can record my voice“
- “I will come to university tomorrow“
- “I can’t speak while working“
- “I will free tomorrow“

Task-2:

Invite friends to join Facebook was second task. Task two had four steps. In first phase of testing 63% students could not complete this task where as in send phase every student has completed this task successfully. When most students entered email address of their friend (s), they have faced following problems

- That “page” was not found
- A message was appeared that “one of the email addresses you entered cannot be invited, the person may be on Facebook but have restricted privacy settings”
- No results found for that email address. But actually that person was already active member of Facebook

Important Observation beside of measurement/ Assessment
- “I am aware of testing because I have already participated in usability test“
- “If I speak then I cannot perform my tasks“
- “I am not comfortable with video recording“
**Task-3:**

*Send Message to your Friend* was next task and it contained seven steps. In first phase 13% and in second phase 38% students could not complete this task. Common problems raised during this task are listed below

- Some students could not find how to send message
- When a student clicked on sent message option and wrote message in text area so when student clicked on send button he/she got a message to enter email address of your friend.
- For sending message whenever students have selected their friends to whom they wanted to send message they were shifted back to their home page.

**Important Observation beside of measurement/Assessment**

- “Tasks are easily understandable“
- “I am not satisfied with internet speed“
- “I will come to university after some time“
- “Ok! No problem, I will speak“
- “I am having problem in understanding the task“

**Task-4:**

Task-4 was about to *Create Album and Upload Photos*. Students followed ten steps for completion of this task. 25% Students in first phase and 38% Students in second phase could not complete this task.

- It was difficult to find out photo option. Mostly students click on setting but photo option was in “Application Settings”
- Facebook do not detects JVM (Java Virtual Machine) because of that many Students feel difficulty in uploading picture
- Some students received message while uploading picture “Upload Failed Please try again”
- It was confusing for the students weather to click on “Save Changes” or “Publish Now” after they uploaded the picture

**Important Observation beside of measurement/Assessment**

- “Can I perform tomorrow?“
- “It is difficult for me because of internet connection“

**Task-5:**

This task was about to *upload video*. Total nine steps were in step 5. In phase one 38% students could not complete this task and in phase two 25% students could not complete it.

- It was difficult to find upload video option. Because mostly students click on setting but actually it is under application settings
- After uploading the video students were confused problem was that after loading video a message was appear that *“This video is currently processing”* and a few options was there “*Edit*”, “*Delete*” and “*Back to My Video*”. Students didn’t know what to do.
Important Observation beside of measurement/ Assessment

- “My internet connection is disconnecting again and again“
- “It will be a bit difficult for me to speak because I will not fully concentrate“
- “If you want video recording I have no objection“
- “I am going to perform test but you will not record my video“
- “I will perform another time because I am having internet problem“

Task-6:

Write on Wall (Share Information with All Your Friends) was task number six. 13% students in phase one and 25% in phase two could not complete this task.

- “Wall” is not mentioned anywhere on Facebook, which was difficult for many students to complete this task.
- Also instead of wall it is written there “What’s on your mind?” written in message box so students were confused that this is some kind of message.

Important Observation beside of measurement/ Assessment

- “I have no problem because of audio recording“
- “I have a class now; I will perform after 2 hours“.
- “I am studying right now just give me 30 minutes“
- “Can I participate in your test“
- “I am not comfortable because of privacy“
- “How much time it will take“

7.6 Experiment Analysis

We have conducted usability test and 16 students of BTH (Blekinge Institute of Technology) have participated in test. We have applied two different usability testing techniques (think aloud protocol and remote testing). We have divided 16 students in two groups. Eight students participated in think aloud protocol technique and same number of students participated in remote testing technique.

We have selected test participants from different departments of BTH (Blekinge Institute of Technology) like Computer Sciences, Software Engineering and Business Administration and all students have performed 6 different tasks. We also note down different observations, comments and body language of students with audio and video recording while students were performing the tasks but before test audio and video recording permission was taken from each student. In remote testing, we also remotely access desktop of students and took screen shots of student’s desktop and video of student.
7.7 Comparison

We have highlighted the usability tasks as given in figure 11

![Figure 11: Tasks Selection for Usability Test](image)

Comparison of think aloud and remote testing is given in Table 8

<table>
<thead>
<tr>
<th>Technique</th>
<th>Think Aloud Protocol</th>
<th>Remote Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task-1</td>
<td>25.79</td>
<td>23.84</td>
</tr>
<tr>
<td>Task-2</td>
<td>8.31</td>
<td>11.82</td>
</tr>
<tr>
<td>Task-3</td>
<td>12.28</td>
<td>10.07</td>
</tr>
<tr>
<td>Task-4</td>
<td>19.63</td>
<td>18.36</td>
</tr>
<tr>
<td>Task-5</td>
<td>16.23</td>
<td>22.23</td>
</tr>
<tr>
<td>Task-6</td>
<td>4.29</td>
<td>6.34</td>
</tr>
<tr>
<td>Total Time</td>
<td>86.53</td>
<td>92.66</td>
</tr>
<tr>
<td>Average Time</td>
<td>14.42</td>
<td>15.44</td>
</tr>
<tr>
<td>Total Number of Incomplete Tasks (U)</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Total Number of Complete Tasks (C)</td>
<td>34</td>
<td>37</td>
</tr>
<tr>
<td>Total Number of Errors Found</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Total User</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>
We have compared the results of both usability testing techniques (think aloud protocol and remote testing) after conduction of experiment. There was no significant difference between think aloud protocol and remote testing. Table 8 shows the comparison between think aloud protocol and remote testing.

Total number of students participated in usability test, time for each task and also total time spent on each task, total number of completed / uncompleted tasks and total number of errors found in usability testing techniques.

In think aloud protocol eight students have participated in usability test. Task-1 took overall 25.79 minutes, task-2 took 8.31 minutes, task-3 took 19.63, task-4 took 19.63, task-5 took 16.23 and task-6 took 4.29 overall times for completion of tasks. Phase 1 took overall 86.55 minutes for completion of 6 different tasks. In think aloud protocol total number of incomplete tasks were 14 and 34 tasks were successfully completed by test participants. Total 9 errors were identified in think aloud protocol.

In remote testing, eight users have participated in usability test. Task-1 took overall 23.84 minutes and so on as shown in the table and overall time of phase two took 92.66 minutes. Total numbers of incomplete tasks were 11 and total numbers of successfully tasks were 37. Only 6 errors were identified using remote testing technique. After conduction of test we examine that think aloud identified more errors and took less time than remote testing. But students completed fewer tasks in think aloud protocol as compared to remote testing.

Table 9: Resources

<table>
<thead>
<tr>
<th>Resources</th>
<th>Think aloud protocol</th>
<th>Remote Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test environment</td>
<td>1 Library Room</td>
<td>2 Library Room</td>
</tr>
<tr>
<td>Audio and Video Recording</td>
<td>General purpose video camera</td>
<td>Skype, VodBurner</td>
</tr>
<tr>
<td>System specification for test</td>
<td>1 Laptop / desktop</td>
<td>2 Laptop / desktop</td>
</tr>
<tr>
<td></td>
<td>➢ 2.0 GHz Processor</td>
<td>➢ 2.0 GHz Processor</td>
</tr>
<tr>
<td></td>
<td>➢ 120 GB hard disk</td>
<td>➢ 120 GB hard disk</td>
</tr>
<tr>
<td></td>
<td>➢ 1.6 GB Ram</td>
<td>➢ 1.6 GB Ram</td>
</tr>
<tr>
<td></td>
<td>➢ Gateway</td>
<td>➢ Gateway</td>
</tr>
</tbody>
</table>
7.8 Efficient Technique

Remote testing required some special equipment such as telephone, special software to access student’s desktop screen remotely, special software/camera to record student’s audio and video of students. We can say on the basis of our test result that remote testing required some special equipment and think aloud protocol does not required any special equipment.

On the basis of time, number of errors found and resource requirement we concluded that think aloud protocol is more efficient than remote testing from social network’s point of view (Facebook).

7.9 Survey Analysis

We have designed questionnaire for usability evaluation of online social network (Facebook). There were total 24 questions in questionnaire, 21 of which were close ended questions and the remaining 3 were open ended. The rationale behind the open ended questions was to know the most serious problems, most prominent features and student’s suggestions for improving usability of Facebook.

We have published the questionnaire on Facebook “Wall” and also on its learning (BTH). We have also sent the survey form to our friends who were students of University of Colorado USA. We have published the questionnaire after one week of execution of usability test. We have got reply from total of 50 students. 25 of them have filled the survey form fully and submitted it. Same number of students partially filled the form. As shown in Figure 13, 52% of survey participants were from Pakistan and remaining were from other countries. 92% students were male and 8% females contributed in survey as shown in figure 14.

Age of 58% survey participants was between 26-30 years as given below in figure 15. The survey participants were also using other social networks and 38% of them were using Orkut, figure 16 shows the percentage of other social network members. 96% survey participants were already Facebook members.

Majority of them was using Facebook for 6 months to two years and their percentage was 32%. Also about most of survey participants first impression of Facebook was average. According to our survey 90% students use Facebook to keep in touch with friends, 72% for entertainment and 55% for information sharing. Only one student replied that he/she use Facebook for learning.
7.9.1 Problems in Facebook from survey results

**Facebook profile**
*Contains personal information e.g. contact number, email etc that you share on Facebook*

Facebook do not provide any mechanism to its members for customizing their profile according to their needs. Also updating profile is also difficult. As shown below in table 10, 30% survey participants complained for having problem in Facebook profile. Some of them have complained that it is very difficult to change profile ID while other were having problem in updating profile, change profile settings and in uploading Profile Picture.

**Searching people**

37% students complained about searching people and most of them complained that they cannot search any person by date of birth and their percentage was 47%. Others complained that they cannot search by second name and by region. Also 12% students complained that searching is difficult.
**Facebook groups**

One of the most frustrating features of Facebook is unwanted invitations from different groups. There is no mechanism to avoid such invitations. Examples of such invitations cause invitation, café world neighbor request, what does your name mean request etc. 24% students have not used group feature. But on average 19% students complained for having problem in facebook groups feature. Majority of them complained that it is very difficult to edit group settings.

**Facebook media**

*(Videos, Picture)*

Facebook supports only limited formats for video files. Facebook provide different ways for uploading videos and all options are confusing. Usually while uploading videos facebook stop responding. 22% students were not satisfied with the facebook media and were facing different types of problems. Majority of them were facing problem in uploading video and their percentage was 29%. Also 32% students complained about unwanted requests. Others were also having different types of problems in facebook media as given in table 10.

**Picture Tagging**

*(The ability to identify and reference people in photos)*

Picture tagging was also proved to be difficult and 22% students have shown different types of problems they face. 30% students do not even know how to tag picture. Another problem that was identified is that “too much tagging in a picture makes it difficult to know where it is tagged”.

Let Facebook member 1 and member 2 are friends, and member 2 and member 3 are friends directly member 1 is not a direct friend of member 3. Now if member 2 tags any picture of Member 3 then member 1 will get the message that member 2 has tagged the picture of Member 3 now Member 1 can see the complete album of member 3, instead member 1 should be given access only to the tagged picture as shown in figure 17. So unzipping the complete album of tagged picture is major privacy issue in Facebook.
Video tag
(The ability to identify and reference people in videos)

49% students do not know how to tag video. On average 23% students found difficulty in video
tagging also to add tag was also proved difficult tagging.

Facebook wall
(A place for your Facebook friends to post notes on your profile)

23% students were having problem in Facebook wall feature. Majority of them complained that
in order to see older posts, wall page gets very long. 38% students complained that long wall gives birth
to the problems of scrolling and sometimes it hangs the internet explorer and also sometimes runs out of
memory.

Chatting
(Online messaging with friends)

The most serious problem according to our survey was chatting. On average 43% students were
having problem in chatting. 59% students complained that Message deliver with delay while chatting.
51% complained that recipient gets offline and 38% complained that recipients keep on getting online and
offline. Student’s comments are given as

- “Invisibility of members sometimes but their status is online”
- “Lot of problems in chatting”
- “No voice chat facility”
- “Usually message not sent”
- “Sometimes it takes long time to send the message”
- “Sometimes I cannot send any message (public or private) to some friends “
<table>
<thead>
<tr>
<th>Problems Type</th>
<th>Sub Problems</th>
<th>Percentage of Survey Participants</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Facebook profile</strong></td>
<td>Updating profile</td>
<td>29</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>Change setting</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Upload Profile Picture</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td><strong>Searching people</strong></td>
<td>Cannot search by region</td>
<td>39</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>Cannot search by second name</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cannot search by date of birth</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td><strong>Using Facebook groups</strong></td>
<td>Group creation</td>
<td>18</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Group Searching</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group editing</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Group joining</td>
<td>08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quitting from group</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td><strong>Facebook media</strong></td>
<td>Creating album</td>
<td>21</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Sharing album</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Adding new picture</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sharing picture</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uploading picture</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sharing video</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uploading video</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unwanted requests</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td><strong>Picture tag</strong></td>
<td>Add tag</td>
<td>14</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Delete tag</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I don’t know how to tag picture</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td><strong>Video tag</strong></td>
<td>Add tag</td>
<td>14</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>Delete tag</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I don’t know how to tag video</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td><strong>Facebook wall</strong></td>
<td>I can’t find facebook wall</td>
<td>14</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>I can’t write on facebook wall</td>
<td>08</td>
<td></td>
</tr>
<tr>
<td></td>
<td>To see older posts, wall page gets very long</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>09</td>
<td></td>
</tr>
<tr>
<td><strong>Chatting</strong></td>
<td>The recipient gets offline</td>
<td>51</td>
<td>43%</td>
</tr>
<tr>
<td></td>
<td>Message deliver with delay</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>keeps on getting online and offline</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>
Figure 18 shows the problems in Facebook

Facebook Security and Privacy

Students Comments about Appearance and Display of Facebook is given in appendix D
7.10 Patterns

From the information given in Appendix B we have extracted some patterns

1. Facebook has issues in both offline and online messaging.

Textual interaction is problematic in Facebook

- Please draw kind attention to the privacy of Facebook
- More issues in Facebook related to security and privacy
- Security and Privacy is a potential problem in Facebook.

It indicates that Facebook members want more privacy.

- Search results pagination
- Searching is not always identical
- Not accurately search
- Searching options needed to be improved

It also shows that searching options are also having problems.

7.11 Possible Extension in Usability Testing Techniques

7.11.1 Think Aloud Protocol

In think aloud protocol students have to verbalize while performing the test. But during our experiment we have observed that it is not easy for the students to verbalize while performing tasks. We suggest that it can be more accurate if participants do not verbalize during the test and keep their concentration on performing the tasks and after finishing each test students verbalize their thoughts and explain what they did. Process of verbalization after each task might give good results as student will concentrate fully on performing task and also after finishing each task student can explain thoughts easily.

If students do not verbalize and keep their concentration on just performing the tasks then they can perform better and at the end of each task their verbalization can help the evaluator to identify more problems.
This chapter is about discussion and validation assessment of this thesis. We have discussed issues, usefulness and usability evaluation on the basis of our results given in 8.1. Section 8.2 is about validation assessment. Summary of empirical work is given in section 8.3.
8.1 DISCUSSION

8.1.1 Simplicity

Achieving simplicity is very important in interaction design. Many online social networks could not attract internet users because they were not simple for a common internet user. From usability tests and survey we have concluded that majority of students have considered Facebook interface as good but not very good still it needs some improvements because some students are still having issues with simplicity of Facebook.

8.1.2 Learnability

When a new user interacts with the system how easily that user can perform the basic tasks. From the usability test results it is clear that most of the test participants have performed the basic tasks easily. However some of them could not perform all tasks. Facebook need some improvements if learnability is considered.

8.1.3 Memorability

The system should be easy to remember if any user return to system after an absence then user can complete tasks easily (Folmer and Bosch, 2004). Most of the students have shown satisfaction with the memorability of Facebook.

8.1.4 Completeness

In usability test majority of students were satisfied in terms of completeness because they have easily completed their tasks such as upload photos, upload video, invite friend and write on wall etc. However some students could not complete their tasks and they have reported different kinds of problems while completing tasks.

8.1.5 Aesthetic

It means that the system should not contain any irrelevant information that may disturb people while performing task. According to usability test and survey results some features are disturbing for the Facebook members like uploading pictures or videos. Facebook has different options for uploading pictures or videos but those options are confusing. Instead it should be simple so that members can understand it easily.

8.1.6 Predictability

It means that the future states of a system may be predicted on the basis of knowledge of present and past states of the system. Most of time online communities Facebook are not completely predictable because whenever Facebook members want to invite a friend and upload a photo they did not meet preferred result.

8.1.7 Richness

The system should be rich to magnetize users. Online community (Facebook) provides richness in term of contents and also it provides valuable information for members.
8.2 VALIDATION ASSESSMENT

Data validation of research results is necessary for research work whether it is qualitative or quantitative. We have adopted combination of both qualitative and quantitative approach. Most of the research work in our thesis is qualitative. We reviewed the results by following the criteria given by Guba and Lincoln. There are four different kinds of validity assessments for qualitative research.

8.2.1 Creditability

Creditability means that the results of qualitative research are believable from participant’s point of view. The main idea of the qualitative research is to accomplish creditability of this thesis. We have intended a multiple phased based research methodology, totally based on previous literature review, questionnaire and usability test outcomes. For this purpose we have contacted with developers (Pakistan) and sent our usability test results for validation. We are sure about the credibility of this study.

8.2.2 Transferability

Facebook is similar to other online communities. It means that Facebook has more or less same functions and interfaces that other social communities have.

8.2.3 Dependability

Dependability is about taking place of any change in the context of research at any time can affect the setting (means that if we make any change Facebook setting according to our result, so it can effect Facebook setting) and overall system. This is the job of researcher to give details of changes and to cause effects on research over time. We have planned to conduct usability test of Facebook in dissimilar timing (morning, afternoon, evening and weekend) according to the availability of subject.

8.2.4 Conformability

Means that founded results (we got our result from experiment) of research work are confirmed by other researchers. We properly documented both phases of findings of usability evaluation. Also we have designed questionnaire on the basis of literature and we sent our usability test result to developer.

8.3 Summary of Empirical Work

We have selected two usability testing techniques think aloud protocol and remote testing to conduct usability test. We have selected 18 students from BTH whereas 2 students participated in pilot study. We have also designed questionnaire to find out usability issues in online social network with the focus on Facebook. After conduction of usability test we found that although think aloud protocol is more efficient but this difference is not significance. We also found different issues related to usability from questionnaire such as in Facebook profile, groups, media and searching options etc.
9 EPILOGUES

We have discussed conclusion of this research work in section 9.1 whereas answering to the research questions is in section 9.2. Section 9.3 contains recommendation. Research gap is discussed in section 9.4 whereas future work is given in section 9.5.
9.1 Conclusion

The main intention of this research work is to find out the efficiency of different usability testing techniques from social network’s point of view (Facebook) and also to identify the usability issues in Facebook. To find out the efficiency and usability issues in Facebook, we have evaluated most common features of Facebook by using usability testing techniques.

On basis of literature review we have selected two different techniques for usability testing. We have selected 18 students from different department of Blekinge Institute of Technology Ronneby, Sweden. 16 students have participated in usability test whereas 2 students participated in pilot study. Usability test was conducted in two phases, in initial phase, think aloud protocol technique was selected for usability evaluation and remote testing technique was selected for the second phase.

The computer lab of Blekinge Institute of Technology Ronneby, Sweden was used for usability experiment according to the user’s availability. Usability tests were performed in totally natural environment i.e. neither totally free nor fully controlled.

We have also conducted survey with the intention to identify the usability issues in Facebook. Students from different universities (Blekinge Institute of Technology Sweden and University of Colorado, USA, Bahria University, Pakistan) and software developers from different companies have participated in the survey.

We have identified different usability issues in Facebook such as issues in media, chatting, facebook profile, changing profile name etc. Here we can say that although think aloud protocol is more efficient then remote testing but this difference is not very significant. We have also suggested some extension in usability testing techniques. If participants of usability test do not verbalize while interacting with the system and keep their focus on performing the test. After completion of each task participants can express their thoughts and opinions what they did. Furthermore we sent our found results to developer for validation purpose. Developers replied that the results of this research are satisfactory.
9.2 Answering Research Questions

1. **What are the usability issues in social networks with focus on Facebook?**

   *Answer:* We have identified different issues related to usability in online social network with the focus on Facebook. We found some major usability issues in uploading video, picture, searching option, offline messages etc. Usability issues are further described in chapter 7, section 7.9 problems in Facebook and page number 57.

2. **What is the efficiency of usability evaluation techniques from a social network’s point of view?**

   *Answer:* We didn’t observe any significance different between the test results of think aloud protocol and remote testing techniques in the usability test from social networks point of view with the focus on Facebook. On the basis of our test result we can say that think aloud protocol is slightly more efficient then remote testing.

3. **What are the possible improvements in the existing usability evaluation techniques from social network points of view?**

   *Answer:* While conducting the usability experiment we experience that users was not compatible to speak loudly while performing the tasks. We have also suggested some extension in think aloud protocol. If participants of usability test do not verbalize while interacting with the system and keep their focus on performing the test. After completion of each task participants can express their thoughts and opinions what they did.
9.3 Recommendations

We have listed the recommendations. Our recommendations may result in making improvements in the online social network (Facebook). Recommendation mentions below are based on the student’s observations and comments from usability test, analysis of the usability test, survey results and developer’s comments.

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unwanted Invitations From Different Groups</strong></td>
<td>One of the most frustrating features of Facebook is unwanted invitations from different groups. There is no mechanism to avoid such invitations. Examples of such invitations cause invitation, café world neighbor request, what does your name mean request etc. There should be a mechanism to avoid such invitations so that it does not create frustration.</td>
</tr>
<tr>
<td><strong>Long Pages Cause Frustration</strong></td>
<td>Long pages cause frustration for users instead long page should be divided into different pages by giving those numbers. In order to see older posts sometimes wall page becomes very long and sometimes it runs out of memory.</td>
</tr>
<tr>
<td><strong>Define Terminology</strong></td>
<td>Terms like Wall and Tag etc should be defined precisely. “Wall” should be mentioned on the main page because it is not mentioned anywhere in proper words and it was confusing for most students.</td>
</tr>
<tr>
<td><strong>Retrieval of Deleted Message</strong></td>
<td>Once a message deleted from inbox it cannot be retrieved, there should be option so that if any message deleted from inbox it is moved to recycle bin. And later if someone wants to retrieve that message he/she can get it.</td>
</tr>
<tr>
<td><strong>Support Video File Formats</strong></td>
<td>Facebook supports only limited formats for video files. Facebook provide different ways for uploading videos and all options are confusing.</td>
</tr>
<tr>
<td><strong>Customizing Profile</strong></td>
<td>Facebook do not provide any mechanism to its members for customizing their profile according to their needs. Profile customizing feature can be very beneficiary.</td>
</tr>
<tr>
<td><strong>Customizing Fronts</strong></td>
<td>Customizing Fronts (size, color, background etc) feature should be included.</td>
</tr>
<tr>
<td><strong>Offline Messaging</strong></td>
<td>Facebook members should be allowed to send and receive messages while they appear offline.</td>
</tr>
<tr>
<td><strong>Recommendation</strong></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Educational Material</strong></td>
<td>Educational material and other facilities relevant to sports etc</td>
</tr>
<tr>
<td><strong>Voice And Video Chat</strong></td>
<td>Chat feature need more intention to improve because majority of students are not satisfied with chat of facebook. It could be good to include video and voice chat because we found that in survey 82% students demand for these features.</td>
</tr>
<tr>
<td><strong>Online Dating</strong></td>
<td>Also 50% survey participants have asked for online dating feature.</td>
</tr>
<tr>
<td><strong>Expressing Feelings And Emotions</strong></td>
<td>Make sure to have different style of expressing your feeling and emotion to your friends like text, card banners etc. there should be a special site like facebook style from which members can copy the code and put into others wall, and express their feeling and wish them on different occasions.</td>
</tr>
<tr>
<td><strong>Pictures / Videos Uploading Is Confusing</strong></td>
<td>There are so many options to upload photos and upload videos. Many students got struck in usability test and confused. It could be good enough to have one and simple option for uploading photos and videos.</td>
</tr>
<tr>
<td><strong>Searching Option</strong></td>
<td>Searching options need to be improved. It should be efficient in terms of accuracy of results and response time. Accuracy of times means that it should display search result relevance with search key words. There should be mechanism for searching wall posts Based on survey 50% participants voted for searching option based on region, last name and date of birth.</td>
</tr>
<tr>
<td><strong>Security And Privacy</strong></td>
<td>Most of survey participants were not satisfied with privacy and security of Facebook. Security can be increased by using password strength (must use numbers, keywords and characters).</td>
</tr>
<tr>
<td><strong>Invite Friends</strong></td>
<td>“Invite Friends” feature needs to improve and it should display if someone is already Facebook member. Because it does not display a message that the person is already a member of Facebook.</td>
</tr>
<tr>
<td><strong>Divide Wall Posts On Daily Basis</strong></td>
<td>Also wall posts should be divided on daily basis.</td>
</tr>
</tbody>
</table>
9.4 Research Gap

We conclude that many researchers have done great work in the field of usability after 1990. We have observed that J. Nielsen’s work is a great contribution in the field of usability during 1990 to 2000. But after 2000 not sufficient work has been done in the field of usability especially for the usability of online social networks (rest aside the case study of Facebook). Jenny Preece is among those researchers who did good contribution in the field of usability even after 2000 (Preece, 2001b). Jenny Preece also did great work on the usability of social communities but her work is not sufficient. According to Jenny Preece “Online communities must be well developed so that they are usable by all citizens” (Preece, 2001b).

Now we believe that online social communities have developed to an extent that usability studies can once again be applied with some rigor to highlight important issues which were not possible to highlight in the last decade. This can, we hope, begin some relevant studies that are required to revive a potential research area of usability evaluation.

Jenny Preece did work on usability of online communities in 2001 (Preece, 2001b) which is before the launch of Facebook. Facebook was launched in 2004 and it is indeed a complex system from a usability point of view. It has many different features that require some innovation in using old usability testing techniques (privacy and security being the two examples which need some alternation with respect to usability evaluation). As from different comments of test participants, it is apparently clear that usability of online social networks has some patterns that require special evaluation

- “I am not comfortable because of privacy“ [This points to the special features that are central to online social networks]
- “My internet connection is disconnecting again and again“ [To test usability of online communities, it is required that test participants must be connected with internet]
- “If I speak then I cannot perform my tasks“[This point to the adaptation required in traditional usability evaluation techniques].

One other feature that is unique to an online social community is that since it is web-based (i.e. online), the community website can make use of rich features provided by most of the web-based programming platforms, e.g. colorful widgets and more attractive functionality. This is different from some of the desktop applications e.g. Windows calculator application where the user do not have issues like privacy or security. It can be expected that for usability testing of Windows calculator, no test participant would say that “I am not comfortable because of privacy”.

Previously in usability testing techniques, it was not mentioned in any technique to test the facial expressions (relax/confuse) of test participants, their senses e.g. on Facebook if members share text or media file (picture/video) they think many times if it should be shared or not? Because sharing of test or media file with others do not involve only one sense instead it engages different senses. Also we can not test different trends using previous usability techniques like in modern time trends are changing with every day passing. Trends on Facebook are also changing in form of applications and its functionality.

From the importance of online social networks we have concluded that Facebook has much functionality that is required to be tested for usability. So there is need to design a new usability testing technique or to modify the current techniques for testing the usability of social networks.
9.5 Future Work

This research work is an exertion to contribute in the area of usability evaluation of online social network (Facebook). We also mentioned below some work correlated to this research and desirable to be taken as future work.

We believe that whatsoever is mentioned under recommendation might be useful in improving online social network (Facebook). A research is needed to improve the usability of online social network (Facebook). There is a need to evaluate online social network (Facebook) from members point like gender and cultural.

9.5.1 Gender

There is a need to perform usability test on females because there were only 8% females in our usability test. If we include more females in usability test so there can be significant change in usability test results. Age factor is also very important factor because people with different age groups are members of different online social networks.

9.5.2 Cultural

It could be better if this usability test is performed in different cultural. There may be a significant difference if usability test is performed on different cultural like Asian, European, American, Australian and Arabs.

9.5.3 Increasing the Usability by Considering other Quality Attributes

It can be interesting if we compare other quality attribute with usability from social networks point of view.
10 REFERENCE


Chew, M., Balfanz, D. & Laurie, B. 2008. (Under)mining Privacy in Social Networks.


Sayago, S. & Blat, J. 2006. Conducting thinking-aloud tests and focus groups with the young elderly. *Interactive Technologies Group, Technology Department, Universitat Pompeu Fabra* [Online].


Sharp, P. R. 2002. *Interaction design, beyond human-computer interaction*, Jhone wiley & sons,Inc.,


APPENDIX A: SURVEY QUESTIONNAIRE

PERSONAL DATA

Q1. What is your age?
   o Under 18
   o 19 – 25
   o 26 – 30
   o 31 – 35
   o 36+

Q2. What is your gender?
   o Male
   o Female

Q3. From which country you belong to?

-------------------

BACKGROUND HISTORY

Q4. Have you ever used facebook?
   o Yes
   o No

Q5. For how long have you been using facebook?
   o Less than 1 month
   o 6 months
   o 6 months - 1 year
   o 1-2 years
   o 2 years+

Q6. What was your first impression about the interface design of Facebook?
   o Very good
   o Good
   o Average
   o Poor
   o Very poor
SOCIAL NETWORKING

Q7. Are you using any other online social networking site? If yes please select:

☐ Orkut                          ☐ Twitter                          ☐ Hi5
☐ Flixster                       ☐ MySpace                         ☐ Other, please mention

GENERAL – FACEBOOK

Q8. What is your purpose of using Facebook? Please select one or more

☐ To keep in touch with friends                       ☐ For entertainment
☐ For information sharing                               ☐ For promoting business
☐ For other purposes, please mention

Q9. Which problem (s) you face in facebook profile (contains personal information e.g. contact number, email etc that you share on facebook)? Please select one or more or write down.

☐ Updating profile                                          ☐ Change setting
☐ Upload Profile Picture                                    ☐ Other, please write

Q10. Which problem (s) you face while searching people on facebook? Please select one or more

☐ Cannot search by region                                    ☐ Cannot search by second name
☐ Cannot search by date of birth                              ☐ Other, please write

Q11. Have you ever faced any problem in using facebook groups? Please select one or more

☐ Problem in group creation                                   ☐ Problem in group Searching
☐ Problem in group editing                                     ☐ Problem in group joining
☐ Problem in quitting from group                               ☐ Other, please write

Q12. Which problem (s) you face in facebook media (videos, Picture)? Please select one or more

☐ Problem in creating album                                    ☐ Problem in sharing album
☐ Problem in adding new picture                                ☐ Problem in sharing picture
Q13. Which problem (s) you face on picture tag (the ability to identify and reference people in photos)? Please select one or more

- [ ] Add tag
- [ ] Delete tag
- [ ] I don’t know how to tag picture
- [ ] Other, please write

Q14. Which problem (s) you face on video tag (the ability to identify and reference people in videos)? Please select one or more

- [ ] Add tag
- [ ] Delete tag
- [ ] I don’t know how to tag video
- [ ] Other, please write

Q15. Which problem (s) you face on Facebook wall (a place for your Facebook friends to post notes on your profile)? Please select one or more

- [ ] I can’t find Facebook wall
- [ ] I can’t write on Facebook wall
- [ ] To see older posts, wall page gets very long
- [ ] Other, please write

Q16. Which problem (s) you face while chatting (online messaging with friends) on Facebook? Please select one or more

- [ ] The recipient gets offline
- [ ] Message deliver with delay
- [ ] Keeps on getting online and offline
- [ ] Other, please state

FACEBOOK PROPERTIES

Appearance

Q17. Which of the following problem (s) you face in appearance of Facebook?

- Color Scheme
  - [ ] Yes (Please Specify)
  - [ ] No

- Page Length
  - [ ] Yes (Please Specify)
  - [ ] No
Font Size  
- Yes (Please Specify)
- No

Scrolling  
- Yes (Please Specify)
- No

Pagination  
- Yes (Please Specify)
- No

**Display**

**Q18. Which of the following problem(s) you face in display of face book?**

Resolution of Image  
- Yes (Please Specify)
- No

Quality of Video  
- Yes (Please Specify)
- No

Text (Size/Color/Type)  
- Yes (Please Specify)
- No

Navigation  
- Yes (Please Specify)
- No

Search  
- Yes (Please Specify)
- No

Search Engine  
- Yes (Please Specify)
- No

**SECURITY AND PRIVACY**

**Q19. What do you think about facebook security (Password, Account)?**

- Very good
- Good
- Average
- Poor
- Very poor
Q20. What do you think about facebook privacy (Profile Access)?
   o Very good
   o Good
   o Average
   o Poor
   o Very poor

Q21. What additional features would you like to have in facebook?
   □ Video chat  □ voice chat
   □ Online dating  □ Other, please write
   □ More search options e.g. based on region, last name, date of birth.

Q22. What is the most prominent feature of facebook? Please write down.

Q23. Please write down you suggestions for improving facebook.

Q24. What are most serious problems in Facebook? Please write down.
APPENDIX B: COMMENTS FROM SURVEY PARTICIPANTS
(Most Serious Problems in Facebook)

- Text chatting is not efficient, this should be improved, sending messages needs to be improved.
- More issues related to security and privacy of individuals must be focused and there is need to draw clear line between information sharing resources and privacy issues.
- Please draw kind attention to the privacy. Friends may not allow accessing other friends. I cannot add my friends because they add my girl friend.
- Integrated applications and games should be designed for sharing less information on that application.
- Difficulties in connecting people mostly status online/offline problem
- Security and Privacy is a potential problem. Especially when access permission page was shown for leaving facebook to other application pages and everybody have agree to sent his personal information. Nobody known who is going to take your personal information.
- The most serious problem which I am facing is no voice and video chat availability
- Most serious problem about facebook is that it makes my account temporarily disable for many times.
- There is not so serious problem that I have ever faced, but only the news and feed that I sometime see are very old, and after refreshing the page I got new ones, but after some time when clicking on home or on any other option I again see these old ones more than a month.
- Not use professional language e.g. “how many people wana kiss u?”
- Facebook also have different types of problems if used in mobile e.g. in mobiles it has problem of Pagination or scrolling.
- Searching options needed to be improved.
- It should be efficient in terms of accuracy of results and response time. Accuracy of times means that it should display search result relevance with search key words.
- Not accurately search but require more affective like Google
- Search results pagination
- Searching is not always identical
- “Invite Your Friends” feature needed to improve and it should display if someone is already Facebook members. Because it does not display a message that members has having a Facebook account.
- No mechanism for searching wall posts
- Required 50% more search options e.g. based on region, last name, date of birth
- Most of students during experiment were confused while publishing the photos. The problem with students were that after browsing the photos there were two options one was “Save” and second was “Publish” so students got struck, should I clicked on save or publish.
APPENDIX C: SCREEN SHORTS

Figure 20: Problem 1

Figure 21: Problem 2
Figure 22: Problem 3

Figure 23: Problem 4
Figure 24: Skype Messenger

Figure 25: VodBurner Application

Figure 26: Facebook Privacy
APPENDIX D: STUDENTS COMMENTS

Appearance

Table 12: Students Comments about Appearance of Facebook

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Student’s Comments</th>
<th>Problems percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color Scheme</td>
<td>➢ Not lot of facilities to change our profile</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>➢ Not good colors used</td>
<td></td>
</tr>
<tr>
<td>Page Length</td>
<td>➢ Difficult to locate the required information</td>
<td>38%</td>
</tr>
<tr>
<td></td>
<td>➢ It hides similar posts and miss sometimes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➢ Too long</td>
<td></td>
</tr>
<tr>
<td>Font Size</td>
<td>➢ Too small font size</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>➢ Very small might be more color full as using background white</td>
<td></td>
</tr>
<tr>
<td>Scrolling</td>
<td>➢ Frustrating</td>
<td>36%</td>
</tr>
<tr>
<td></td>
<td>➢ Sometimes it gets stuck with it, and sometimes it works</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➢ Big problem to scroll up and down</td>
<td></td>
</tr>
<tr>
<td>Pagination</td>
<td>No Problem</td>
<td>24%</td>
</tr>
<tr>
<td>No Problem</td>
<td></td>
<td>40%</td>
</tr>
</tbody>
</table>

Display

Table 13: Students Comments about Display of Facebook

<table>
<thead>
<tr>
<th>Display</th>
<th>Student’s Comments</th>
<th>Problems percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution of Image</td>
<td>➢ low quality results</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>➢ Not good quality of images</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➢ Pictures are not displayed with original resolution</td>
<td></td>
</tr>
<tr>
<td>Quality of Video</td>
<td>➢ Not good quality of video</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>➢ Smaller place for sharing videos</td>
<td></td>
</tr>
<tr>
<td>Text (Size/Color/Type)</td>
<td>➢ Must be flexibility</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>➢ Text editing options</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➢ There should be more options to change the text;</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➢ I mean style to write in other walls. Just like Okut style.</td>
<td></td>
</tr>
<tr>
<td>Navigation</td>
<td>➢ When you are new at facebook it’s really hard to get to know how everything works.</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td>➢ Some time broken links</td>
<td></td>
</tr>
<tr>
<td>Search</td>
<td>➢ Not accurately search but require more affective like Google</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>➢ Search results pagination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>➢ Searching is not always identical</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td>37%</td>
</tr>
</tbody>
</table>
APPENDIX E: SCREEN SHORTS OF USABILITY TEST

Figure 27: Create Group

Figure 28: Invite Friends
Figure 29: Send Message

Figure 30: Create Album
Figure 31: Upload Video

Figure 32: Write on Wall