

# **‘My SocioWorld’**

## **An optimized application for mobile social networking**

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## **Abstract**

Being connected with old social contacts and making new social contacts on social networking sites is becoming more essential these days. Mobile social networking is adding value towards socializing world by being connected any day, anywhere, anytime and on the go. Applications providing good user experience and taking full advantage of increasing capabilities of mobile phones are still challenging. The common challenges faced by user while using different social networking sites on mobile phone are; increased level of concentration, limited mobile display and rising cost of mobile communication. Ultimately all these affect users' engagement in mobile social networking.

In this thesis, the focus is to propose an optimize application for mobile social networking by adopting user centred design methodology. It involves integration of users' favourite social networking sites that would facilitate them in socializing with different social networking services from one common user-interface. Further the involvement of users with proposed application is supported by the changing trends of mobile phones by becoming full-featured mobile computers. Several iterative user-interface designs are represented graphically and interaction with those designs is displayed. The proposed application focuses on different ways user could remain active on this application and be able to create new content easily with the help of integrated mobile tools available within smart phone mobile device. Additionally, a usability test is performed with the potential users to validate proposed application. Based on feedbacks and suggestions from the users who performed usability test, further enhancements are made to improve the end-user experience. Thus, by considering the needs and requirements of the end-users the proposed application has been developed to provide enhanced user usability and satisfaction for today's mobile social networking.

**Keywords:** Mobile Social Networking (MSN), My 'SocioWorld' Application (MSoW), Social Networking Sites (SNS), User Interface (UI) Design and Usability Test (UT).

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*&*

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## **List of Acronyms**

AR - Augmented Reality

EITO - European Information Technology Observatory

GPS - Global Positioning System

HCD - Human Centred Design

HCI - Human Computer Interaction

ICT - Information Communication Technology

ISO - International Organization for Standardization

IXD - Interaction Design

LBS - Location Base Services

LBSN - Location Based Social Networking

MSN - Mobile Social Networking

MSNA - Mobile Social Networking Application

MSoW - 'My SocioWorld'

NLUI - Nokia Linked User Interface

SDLC - Software Development Life Cycle

SNS - Social Networking Sites

SPMD - Smart Phone Mobile Device

UCD - User Centred Design

UGC - User Generated Content

UGC - User Generated Content

UI - User Interface

UID - User Interface Design

UX - User Experience

UXD - User Experience Design

VDT - Visual display Terminal

WAP - Wireless Application Protocol

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# Chapter 1 **Thesis Introduction**

## 1.1 **Aim of Thesis**

The aim of this thesis is to develop solution for fast and easy way of accessing and representing different Social Networking Sites (SNS) in one common application for a smart phone mobile device (SPMD). This effort proposes an application in which integration of different SNS are seamless. Also, the proposed application would integrate existing qualities and functionalities of a SPMD to enhance the performance and smartness of the application.

Mobile browsing of SNS leads to opening multiple browsers or specific applications for those SNS. This process is highly inconvenient for a user to view all activity updates from their different networks that might be on several SNS. Proposing an application that allows the users to effortlessly create, edit, share and consume information consistently back and forth from their social networks. The approach of research is to create a user experience that would be easy to learn and adapt in day-to-day life. It would keep the user well connected with their social networks any day, anytime, anywhere and on the go.

Thus, the aim of this thesis is to follow User Centred Design (UCD) methodology and enhance User Experience (UX) while engaging in Mobile Social Networking (MSN).

## 1.2 **Related Benchmark Work**

SNS have been trying to integrate some of the user preferred activities in their services like Facebook integrates Flickr and Twitter updates in the news feeds section. Facebook displays the integrated services updates and quick links to access the site directly from the Facebook news feed section. Tim-Berners Lee in 1995 had a vision of bringing different services into one collective intelligent service through ‘the Web’ (Rana et.al. 2009).

Nokia: Linked UI (NLUI) is a concept that ‘aggregates content from multiple services, associates the content through links and recommends the content most relevant to the

users' (Cui et. al. 2010). This kind of innovation helps user to keep in touch with their contacts on the go.

There have been some examples on Location Base Services (LBS) for social networking through mobile phone like Foursquare and Gowalla, with these service user can check-in a venue by using a mobile website, mobile application, text message or NFC tags check points to indicate their location. These services allow users to reveal their current location or their attendance at a venue, which allows contacts nearby the area to join the same venue. Also users can post comments to the venue, for other contacts to read about suggested things to do, what to visit, where to eat and many more. The user is awarded points or badges from the service for checking in the venue.

Many consulting businesses that involve user feedback and mobile interaction have found ways of using MSN to develop and grow their business. SPMD's tools like high pixel camera, LBS, GPS, cloud computing, User Generated Content (UGC) and Augmented Reality (AR) support variety of user activities on MSN sites.

### **1.3 Motivation and Research Problems**

In earlier days, awareness about social networking, advancement of technology and mobile hardware devices were very limited and unexplored. Now innovative technology motivates to find different ways of social networking using advanced computing technologies and Smart Phone Mobile Devices (SPMD).

It is all about users and their social world. Being socially active in virtual life has become much more easy and convenient due to SNS such as Facebook, Twitter, Flickr, etc. For social reasons it is essential for users to know what their social networks are currently doing on those SNS (Rana et.al. 2009).

Social networking is now facilitated more conveniently through mobile computing. The acute rise of MSN users (Gauntt 2008) has broadened the usage patterns of mobile socializing, by creating frequent content and sharing them at a rapid pace. Thus there arises challenge to design interactions, provide research motivation and questions to develop one application for MSN users (Rana et.al. 2009).

- What are the expectations of the users for social networking?
- What could be the interaction design and optimized approach to enhance the user experience of MSN?
- How user will benefit from using the proposed application?
- Which enhancements to proposed application are required for efficient MSN application?

Introducing a convenient way for users to socialize across multiple social networks by allowing users to be engaged with their contacts. It is of high importance that the UI is visually appealing and integrates seamlessly. Developing the proposed application will require an understanding of users needs for engaging in SNS with a mobile device.

#### **1.4 Thesis Objectives**

On small screen of our smart phone mobile device (SPMD), a separate application for each SNS is not the best option. The objectives of this thesis work are as follows:

- To understand different SNS and the purpose of users involvement with such services.
- Compare transition from web to mobile User Interfaces (UI) of different SNS.
- Develop and test proposed MSN application that allows users to effortlessly create, share, edit and consume information to and fro from SNS.
- To improve the UI design and User Experience (UX) of the proposed application.

#### **1.5 Structure of Thesis**

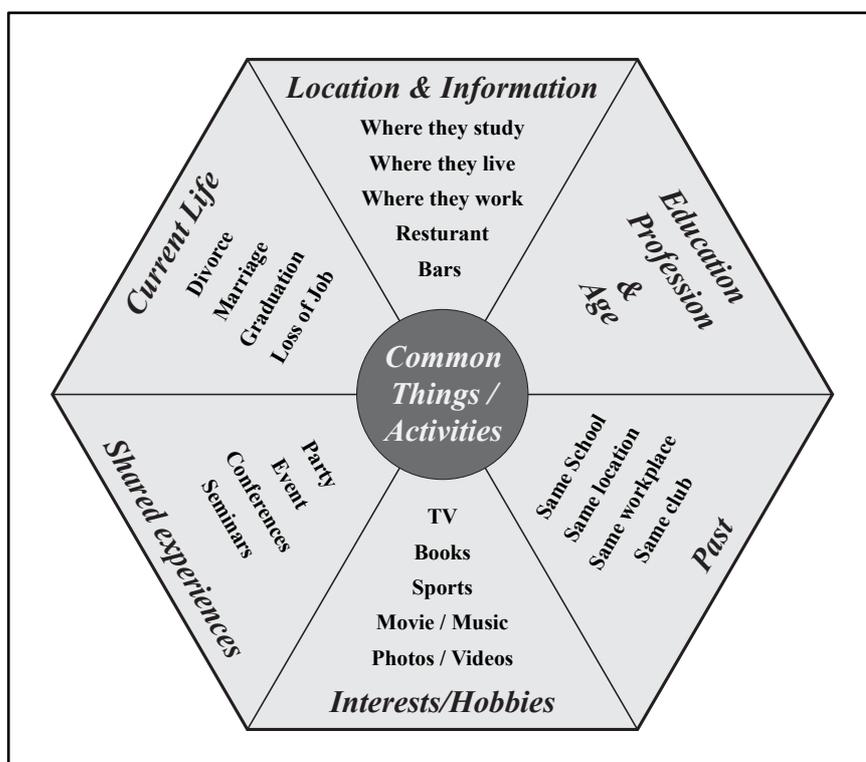
Chapter 1 is an introduction that includes the aim, objectives and thesis outline. Chapter 2 is about involvement in Social Networking Sites (SNS) and describing some different aspects of SNS such as personalization, trust, privacy and users of SNS. Chapter 3 elaborates on involvement in Mobile Social Networking (MSN) by

comparing transition from web to mobile UI and highlighting some of the similar and dissimilar UI elements of mobile social networking (MSN) applications. Chapter 4 introduces the methodology to develop the proposed application using a User Centred Design (UCD) process by creating user persona, use-cases, UI designs and usability testing for the proposed solution. In Chapter 5 describes result of research questions, validation of the usability test result of research work and enhancements of the proposed solution is described. Lastly in Chapter 6, a conclusion of the research work and possibility of further studies are stated to develop the proposed solution as an enhanced and distinct application to optimize MSN.

## Chapter 2 Involvement in Social Networking

Social network or a social community is built up of individuals, groups and /or society that are connected with common interest of building relationships for different reasons such as family ties, friendship, business, social and religious reasons (Boss 2009). “Behavioural science studies show that in everyday life, people choose friends with similar age, income, gender, marital status and /or ethnicity and that similarity of interests is an important factor in liking others” (Cosley, Ludford, and Terveen 2003).

In earlier days there was less awareness and accessibility of the internet. Still the social community performed similar activities of today’s known social networking but in scattered form; like involvement in chat rooms, forums, message boards, personal webpage and blogs. Whereas in recent years due to the growth of social networking services, ways to communicate via internet either through personal computer or mobile phone has increased due to the advanced development and flexibility in Information Communication Technology (ICT) (Social networking 2008).



**Figure 1:** Common things or activities of social networking

Source: Modified on the bases of (Wildbit 2005)

As shown in *figure 1* some of the common things or activities that users would consider while building their social network. They are location, interest, past, current life transition, shared experiences, education, age, profession and other work (Social networking 2008) (Wildbit 2005). Thus, SNS would allow users to create their own profile or personal homepage to interact with other.

## **2.1 About Social Networking Sites**

SNS are defined in many different ways depending on the types of tools and functionality they provide. The “social networking sites are a web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, view and traverse their list of connections and those made by others within the system. The nature and nomenclature of these connections may vary from site to site” (Boyd and Ellison 2007).

Many times SNS are defined as platforms that are built revolving around the online communities of people. These people are the ones who share common interests, activities or those who are interested in exploring other users’ activities by being a viewer. Most of these SNS are web and mobile based, providing many different ways for users to interact (Social network services 2011). SNS are a broad spectrum of rapidly growing service tools and practices to facilitate communication, collaboration and content sharing across networks of contacts (Childnet International 2011).

There are several different definitions, which describes SNS in many different contexts and usage patterns. While SNS are basically services that build, construct and maintain communities where individuals can connect and bond with each other. “SNS also allows users to interact and explore with individuals, communities with common interests or simply remain active in many different ways. This encourages users to represent themselves as socially active and online” (Boyd and Ellison 2007).

SNS are like a social book or an interest group, club, party where people meet and share information, swap resources, ideas and above all socialize with existing as well as new friends (Osborne 2009). These correlations points out that an individual can meet entirely random new individual in these SNS. Many users keep in touch with a circle of friends, friends of friends, colleagues and others to maintain their contacts on SNS.

### **2.1.1 SNS as Part of Our Day-to-Day Activity**

Social networking services have attracted millions of users to spend their time on the internet socializing with old and new friends. As “the phenomenon is vast, intriguing, it has attracted researchers from multiple disciplines to understand the motivations, incentives, behaviours, economics, persuasive patterns, and user experiences of online communities” (Savla and Roto 2009).

Many online communities want to keep their users active by inviting frequent content and status updates. The more active the community, the more important it is for the users to be able to follow the updates on community activities. Mobile access to SNS may oversee as an extension to personal computer, not specifically optimized for mobile use. In this case, the person can use a mobile web browser to access the same community site as on their personal computer (Social networking 2008). If the SNS wants to promote participation anywhere and anytime, it might create a mobile-friendly version of their site that makes it easier and faster way to access the SNS on mobile.

The next level of mobile optimization is to provide a separate application to run on the mobile device that fetches and uploads the data to and fro from the SNS. This can be a full client application or a small widget. This kind of client application is able to utilize the mobile device resources such as the means for giving notifications and uploading user’s current location, which makes it possible to extend the SNS with mobile specific information (Savla and Roto 2009).

The users often perceive SNS as a closed environment and interact with other users (Acquisti and Gross 2006). The user is accountable for their behaviour, language and posts, which might not translate well outside their intended audience. It is important that users understand the public nature of much of their activity within SNS. A different combination of privacy settings and permissions allows users to control the access of their profiles, information, connections and spaces, as well as determine access rights. Hence the users can manage a range of different relationships online, as well as manage their online presence to their friends, family or to the general public.

Social networking services have become extremely popular in recent years, especially among younger generations. Users usually need to sit behind a personal computer (PC)

to do several activities on SNS like upload photos, write blogs and communicate with friends. The development of wireless networks and location sensing technologies has made it easier to track and share personal location information on the go. The Location Based Social Networks (LBSN) is “a social network service where people can track and share location related information with each other, via mobile”. By adding a location dimension, we can bring social networking back from the virtual world into real life and allow real-life experiences to be shared in a more convenient way e.g. ranking interesting locations, discovering new places, people and activities (Xie 2009).

Hence, social networking services seem to have found their roots in the new developing internet age. Users need to be connected with everyone, at any time has subtly become important to develop the new version of social networking.

## **2.2 Motivation for Involvement in SNS**

The development of the new social infrastructure has encouraged many people to join SNS with a specific motivation in mind. One of these motivations is building new or maintaining old relationship. User establishes and maintains their relationships with the world through SNS by filtering their contacts, as they desire. The basis of this social networking is the condition, which facilitate this kind of cooperation among the users. Repetition and reputation are two of the most important features of socializing. “Repetition causes people to cooperate in present and build a reputation that might avoid negative consequences in future interactions with the same person” (Friedman and Resnick 2001).

The main purpose of SNS is the explicit representation of users and their relationships. Different SNS have different approaches with respect to representing social relationships and what a user of the site can do with this representation. Three types of social networking relationships are observed and can be evaluated through the different kinds of intended audiences for SNS.

*SNS for leisure and social activities* - Facebook, Friendster, MySpace, Tribe, Habbo, Bebo, Twitter, Orkut, etc.

*SNS for professionals and businesses* - LinkedIn, Xing, Spoke, Ryze, etc.

*SNS for entertainment and services* like music, movie, locations, etc. - Flickr, Spotify, YouTube, Delicious, FourSquare, Lastfm, Flixter, etc.

Sites that organize users for social events offline have been termed as real world events site (List of social networking websites 2011). Meet ups are catered for a niche in different types of communities that also appear online. The purpose and aim of the specific SNS influences the way in which the site is designed and information gathered through the user profiles will be displayed and to which particular users. In general, “a social network is a set of people connected by a set of socially meaningful relationships” (Wellman & Gulia 1999).

Users are able to use SNS for personal and professional use, communications, establishing new business developments and contacts, scheduling meetings offline (i.e. meeting in the real world), dating without initial real-world communication, to build and manage their real world social networks online. Communities as well as individuals are better and faster informed through online social networking. They are more engaged and involved with one another (Putnam 2000).

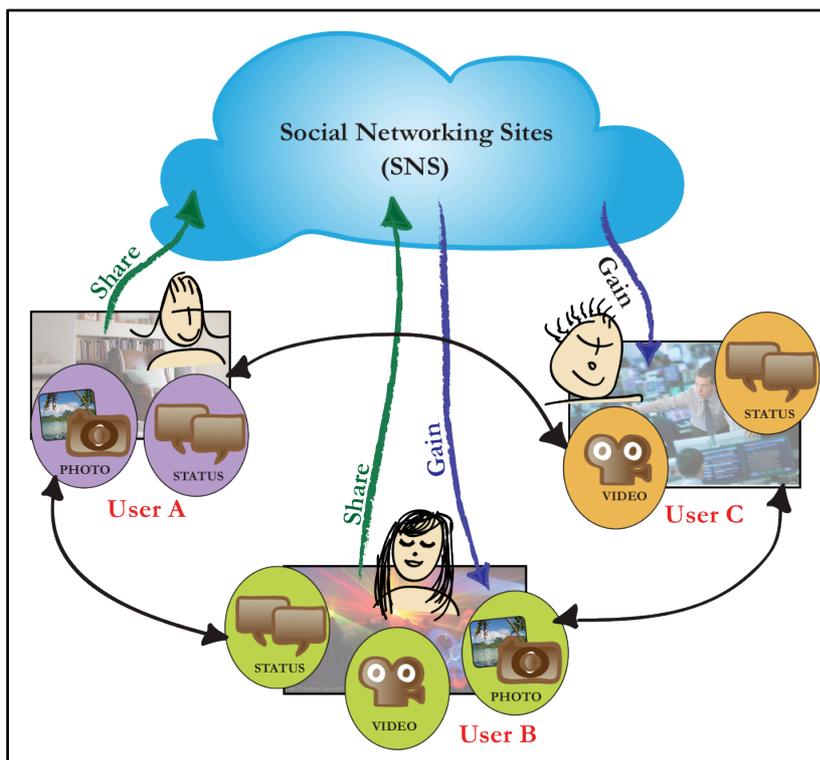
The complete availability of information on social connection brings new venues of possibilities like “Link Routing: routing of information based on the social connections between people” (Decker and Frank 2004). Users of sites are eager to sign up and increase their visibility within a network, and to get as many people to join their network to make themselves more popular and important. With the impression that more connections a person have, the bigger their network is even if the connections are weak ties. Orkut presents its users with large networks as connectors, celebrities and stars depending on the number of profile views, average paths and fan counts each user has (O'Murchu, Breslin and Decker 2004).

Some sites like Facebook, Friendster, Orkut and Ryze show photos for browsing. People are curious and end up browsing through these photos searching for people they know and find attractive. While Orkut facilitates this by its “hot list” or “crush list” section where users can also send a teaser to other user they find attractive. Moving to a new and unknown city is another motivating factor for socializing and building a new community of people. SNS can make it easier to join and connect with new people or

communities within similar geographical location, by sharing common interests and join various offline activities. Hence, SNS turn out to be one of the catalysts in managing or developing connection, which also helps to maintain communication with family and friends effortlessly and at a nominal cost.

### 2.2.1 Create, Share and Gain Information from SNS

A social networking site depends on the act of sharing, cooperation and collaboration, allowing users to manage, build and represent their social networks online. Understanding this benefit in detail will explain us how the SNS function. As shown in the *figure 2*, the online users of SNS have an incredible willingness to share their content with their contacts and in general to SNS. The number of personal photos posted on Facebook and MySpace is a big amount, but it's a safe play that the majority



**Figure 2:** Communication between users and SNS

of photos taken with a digital camera are shared in some fashion. Also there are a variety of status updates, map location of interesting places and half-thoughts posted online through this SNS. The SNS for organized sharing are: Yelp for review, Loopt for

location, and Delicious for bookmarks, etc. “The Sharing is the mildest form of socialism, but it serves as the foundation for higher levels of communal engagement”. While sharing a variety of personal content users also consume and gain from others content. Users also get inspired to leave comments and suggestion for others to look up (Kelly 2009). Hence the circle of sharing and gaining keeps on rotating constantly without any monetary cost and we as SNS users hardly realise how much of our personal life we have posted online.

Cooperation turns out to be another good method to share and gain information from SNS. By cooperation, individuals work together towards a large-scale goal, producing results that develop at the group level. “Amateurs have shared more than billions of photos on Flickr, also they have tagged them with categories, labels and keywords generating a huge database of personal pictures on a SNS” (Kelly 2009).

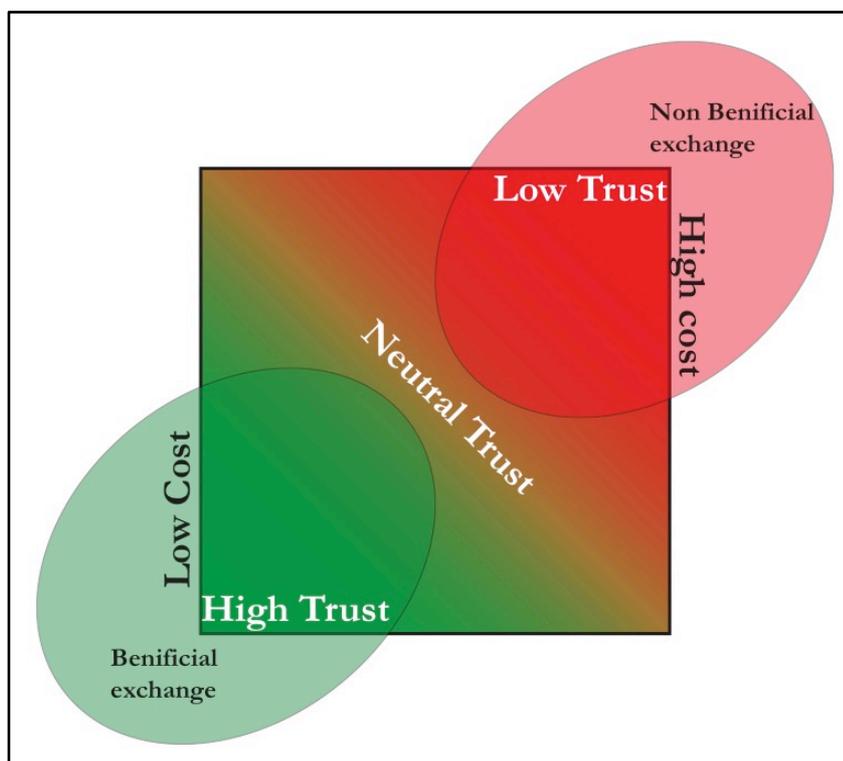
The popularity of creative common licensing means that “communally or not absolute communistically, your picture is my picture and anyone can use that picture” (Creative Commons 2011). There is also the thought that I don’t have to shoot yet another photo of the Eiffel Tower, since the community can provide a better one than I can take myself.

The development of thousands of sites employs the above social dynamic as a double benefit. The first benefit is, the technology gains from the users act and second benefit is users gain from other users by letting them tag, bookmark, rank and archive their pictures. This process of share and gain turns out to be a constructive cooperation and creates additional value that can come only from the group as a whole. For e.g. tagged snapshots of the same scene from different angles can be assembled into a stunning 3-D rendering of the location (Microsoft Corporation Photosynth 2011).

In a curious way, this suggestion overcomes the socialist promise of “from each according to his ability, to each according to his needs” because this improves what you contribute and delivers more than you need (From each according to his ability, to each according to his need 2011).

### 2.3 Trust, Privacy and Personalization of User Information on SNS

Trust is an important aspect of any SNS for user to be involved in the process of socialising. The definition of 'Trust' as cited by Mayer, Davis, and Schoorman is “the willingness of a user to be vulnerable to the actions of another user based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other trustee.” Further, they differentiate between antecedents and consequences of trust. “Antecedents represent factors that cause the trustor to trust the trustee. This decision is based on characteristics of the trustee as well as the trustor’s general propensity to trust” (Mayer, Davis, and Schoorman 1995).

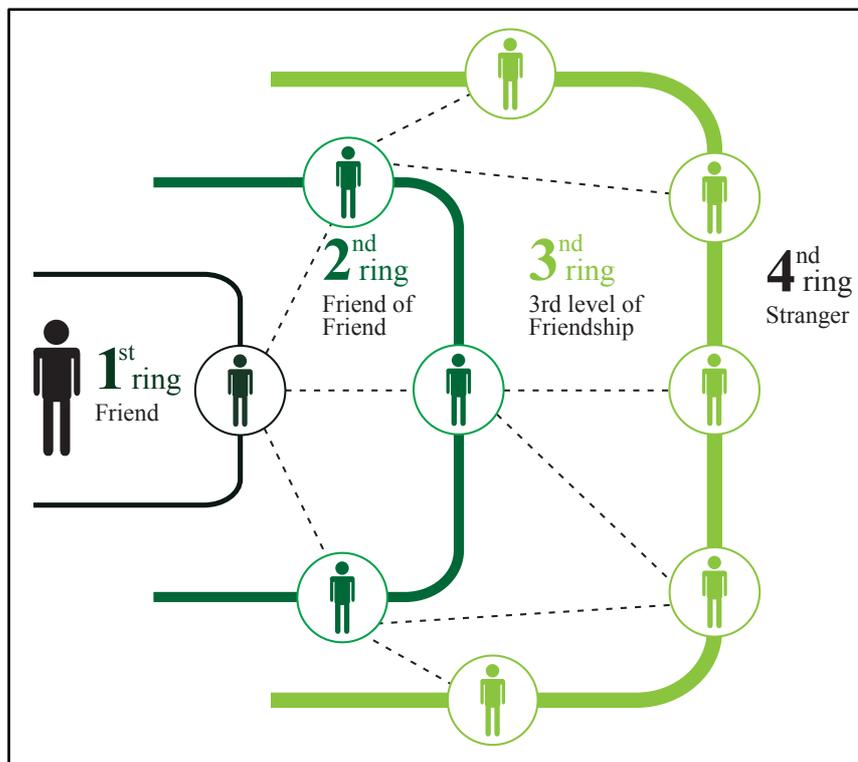


**Figure 3:** Trust and benefit of exchanging information in SNS  
Source: Own visualization on the bases of social exchange theory (Roloff 1981)

These days the SNS users are providing personal information without giving much thought or concern to the issue of privacy. Users provide personal information about their friends for example, by giving testimonials on SNS without being conscious of SNS being public and open for all to see. “Privacy is also implicated in users ability to control their impressions and manage social contexts on SNS” (Boyd 2008). As shown

in *figure 3*, aspect of trust is deeply related to information disclosure and is a central component of social exchange theory (Metzger 2004).

The social exchange theory presents a cost benefit analysis with respect to social interaction. If the exchange is perceived to be beneficial, then the individual is likely to enter into an exchange relationship and high trust will lead to a perception of low cost, and vice versa. Also, trust is a precondition for self - disclosure because it reduces perceived risks involved in revealing private information (Roloff 1981). Social networking sites record all interactions, and retain them for potential use in social data mining (Dwyer, Hiltz, and Passerini 2007).



**Figure 4:** Different levels of friend networks in SNS

Source: Modification from (Judicibus 2004)

SNS are built by making friends and a friend is defined as “someone whose company and attitude one finds sympathetic and to whom one can be closely related” (O'Murchu, Breslin and Decker 2004). As shown in *figure 4*, the main types of relationship listed on SNS are - friends, friends-of-friends, friends-of friends-of-friends and strangers from the community. This listing of friends is given the term “degrees”, and can be believed as a type of weighting for managing friends. Users do not want people five degrees

away to contact them or their own friends (Cheng 2010). So users are given privileges to personalise their profiles and maintain their privacy by defining how much they do want to reveal themselves to the world around them (Six degrees of separation 2011).

SNS like Orkut have a friendship barometer that let users rate their relationship to another user based on their actual relationship with that person: “have not met”, “acquaintance”, “friend”, “good friend”, and “best friend”. SNS like LinkedIn is a good example of privacy over SNS, as it masks a user’s contacts, and other users need to request the contact to view their contacts or other detailed information. While on Friendster, the default setting is - users who are over three degrees away from a particular person cannot see how they are connected to that person and cannot view their full profile, but they can only see a reduced version of that person’s profile (Boyd 2006).

It is observed that users are not so concerned about the privacy of their information on SNS and they show willingness to share information if they gain something out of this exchange. Hence online relationships can easily develop in SNS where perceived trust and privacy safeguards are weak.

### **2.3.1 Personalization of User Profile on SNS**

The basis for social interaction in SNS is a personal profile, which often consists of a personal webpage on the networking site. A personal profile or webpage provides an opportunity for the user to create their own page with content such as pictures, videos, links, texts, and other personal information. The personal profile can be seen as a space for individual creation and expression. A profile page is private and it can be made public to other users in the SNS. An interesting aspect of social interaction on SNS is that the starting point is the individual or personal contact.

The profile page provides opportunities for personalization, where individuals can choose the look and content of their page. An important function of the profile page is that, it serves as the individual’s representation on the SNS. The profile page provides a basis and a starting point for social networking. Socialization begins when a profile page is connected to other individuals profile pages. Each individual can build their own network of personal relationships that are called friends on SNS (Dalsgaard 2006).

There are different methods of communication in a SNS. A unique form of communication takes place through notifications. This kind of communication means friends within a network are notified whenever a profile page is modified or whenever a person performs any kind of action within the SNS. Thus, a form of indirect and non-intentional communication occurs and the communication within SNS is a matter of awareness and transparency (Dalsgaard and Paulsen 2009).

## **2.4 Classification of SNS User based on Behaviour & Characteristics**

A SNS can be a good way to make connections with people that have similar interests and goals. Due to SNS, meeting someone new in person has become a thing of past, the term ‘poking’ has become the new handshake and is now a convenient way to make new friends and renew old connections. Recent profitable interest in SNS has resulted in the development of many new websites “dedicated to help users capitalize on their social networks for socializing, dating, jobs, e-commerce and professional development” (Bhutkar 2009).

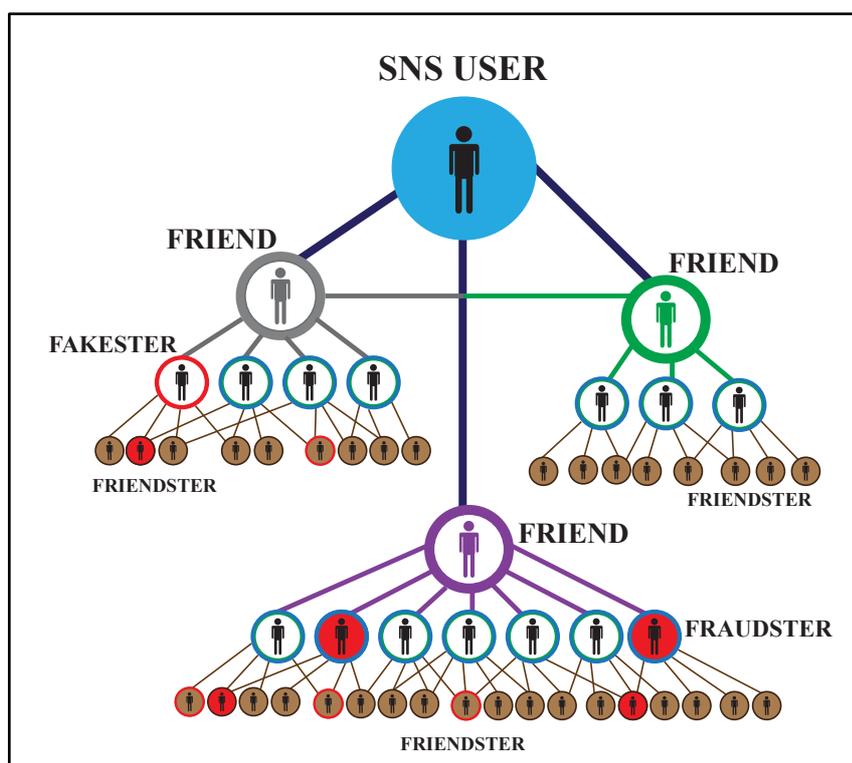
SNS users could be classified into two distinct groups based on their behaviours and attitudes: The first active users are alpha socialisers, attention seekers, followers, faithful, functional whereas the second non active users are concerned about their safety, technical inexperience, intellectual rejecters (Social networking 2008).

The most vulnerable area of development on SNS is friendship and dating. Many websites were launched with this concept; some of them are Friendster in 2002, MySpace in 2003, Orkut in 2004 and Facebook in 2004. These SNS have become extremely popular and attracted millions of users across the globe. Thus, competition in the web market has increased and many more websites with specific concepts were required to be added to this new world of social networking services. Examples of these specific sites include Delicious for social bookmarking in 2003, LinkedIn for business contacts in 2003, WAYN for travelling in 2003, Flickr for photo sharing in 2004, and Answers for reference searching in 2005. These sites started providing options to specific users depending on their intension of socialization.

To understand the characteristics of users on SNS we need to understand how these users get involved in the act of socializing. To start using, a user needs to register as a

user with a respective SNS. Then create a profile that consists of demographic information like sex, age, nationality, education, interests, profile picture, adding of friends etc. Subsequently on the basis of this profile information users can make friends and can have different levels of friendships.

As described by Boyd and Bhutkar, the users of SNS can be categorized in four different SNS as shown in *figure 5*, is representation of SNS user's friendship network:



**Figure 5:** Social network and categorization of user

Source: Modification from (Bhutkar 2009)

*Friend* – Another SNS user, whom the SNS user might know personally in real life, might be closely related and trusted.

*Friendster* – Usually known, as a friend of a friend and a person whom the user might trust because the user trusts the friend. However the user might not even know the friendster personally in real life or may not be closely related.

*Fakester* - SNS users having fake personas and they hide their actual personal information from other SNS users. They can easily be one of the friendsters and are only interested in seeing the profiles of other users.

*Fraudster* - SNS users having fake personas and are untruth about everything; with the intention to be involved in financial cheating or sexual activity causing harm to other users on SNS. These kinds of users can smoothly present themselves to be a friendster and become a bad link in the network. It is very difficult to recognize a fraudster among such a huge network of friends, but if a SNS user is careful in selecting their friends they might not get cheated.

The below mentioned are classification of behaviour patterns observed on SNS, which are compiled based on authors own experience of using and actively participating on SNS, discussions with friends who are active SNS users and from the study of various SNS articles, journals, conference proceedings, blogs and newsletters from Bhutkar, Gibbs, Ellison, Heino, and Windley. Thus *figure 4* and *figure 5* are referred to list some of the behaviour patterns of users on SNS as mentioned below.

*Logically Trustworthy* - Trust has always been a major concern for user on SNS. As understood from the trust and gain theory users easily trust other users if they see a gain from that relationship. It is considered logical to trust friends of a friend, as they are more likely to be good friends than strangers. These friends of a friend are known as friendsters and they can ensure more meaningful and strong connections. While sometimes a friendster may turn out to be a fakester or fraudster with or without reason, hence there is no assurance as such but to trust logically while making friends on SNS (Boyd 2004).

*Social Network Density and Relationships* - An active SNS user can have hundreds of friends, which may include some friends, mostly friendsters, few fakesters and fraudsters. Having many numbers of friends is not always easy to manage and to communicate. But a user might be in constant and active communication with few friends with whom they might be connected online as well as offline. Thus it is not an easy task to measure density of social networks and value the importance of those relationships to a user on SNS (Wildbit 2005).

*Contributing to Communities* - Most of the users on SNS regularly search for other users out of curiosity. In this process, they might get in touch with many friendsters who might have common interests, needs and likes on that basis they form a new group or

community and are actively connected among each other. Many of these communities are quite active and develop a close bonding among their users. Some of these communities also organize get to gethers where users can come and meet other users face to face. Thus SNS gives a new perspective, which leads users to meet in real life apart from contributing to community (Wildbit 2005).

*Creativity by Fakesters* - In the process of creating fakester's profile, users go out of their way to become as creative as possible in their profiles. For example a group of males created a fake female character to provide good testimonials for their friends and to introduce them to interesting women. While some social networks can make fakesters healthier and fitter persons like a fakesters, who under-report their weight, realize that they start losing weight to match their ideal profile. A disagreement against fakesters is they may collapse the SNS, devaluing the meaning and value of connections between users (Kearns 2008). By and large, most users love the fake characters. As they become little hidden treasures in SNS and users usually go seeking out most creative and interesting ones. It suggests that SNS can become less interesting if the fakesters are removed. Also some users mention that fakesters are actually great because they remind them that nothing presented on the SNS is real (Katre 2006).

*Deviation of Information in Profiles* - Many fakesters are not completely faking, but they deviate a little information from their actual profile. A survey about online profiles highlighted that about 81% users provide information that deviates from reality (Howard 2008). Like, men lie more about their height, while women lie about their weight. Most users provide less accurate information on their profile picture. It is considered that more accurate the profile picture, more possibility the user is honest about the information on their profile. Hence it is not really easy to identify any one as faker as we all might be deviating some information in our profiles.

*Age and gender* - Social networking is an activity mostly enjoyed by teens and youths. But, a social networking research study, states that 48% of SNS users are adults (NCSA 2006). The growing number of adults using SNS is an indicator of the increasing popularity and potential security risks of these sites. The gender difference in the usage of SNS, mostly men are looking at women's profiles they do not know and women look at other women's profile they know (Piskorski et.al. 2008). Also according to research

there are more women on twitter than men. Women tweet about the same rate as men, but men's tweets are followed by both sexes much more than expected and this is not the case in other SNS but is the opposite. The remarkable finding here was the gender dynamics. This is because there are no photos on Twitter and women actually say things, while men give references to other things (Silverthorne 2009).

## **2.5 Outcome of Involvement in SNS**

SNS by now have become part of our lives and day-to-day activity by making users habituated of using SNS on web and now on mobile. MSN has become a good extension to the social networking updates by adding different dimension to socializing like location, time, speed of updating the information etc. The basic motivation for users engaged in SNS is to be connected with each other. But the new social infrastructure has given users other motivations for joining. These motivations can be for leisure, socializing, business, professional connections, music, movie, bookmarking, location tagging, travelling, etc. Meeting or finding someone in person can be an option pursued later on in real world.

It shows that if the MSN is made convenient to use and easy to perform users will remain active in socializing with their networks. This information is the strong motivating factor for research and development of an application for users to be active on SNS using mobile devices.

Understanding ways in which a user connects with other users on the basis of trust; usually a friends' friend is a trust worthy person to be a friend. Trust becomes the biggest reason we are still connected with each other on the SNS. Users exchange information and gain from each other on the basis of trust, with this exchange the network of friends grows exponentially and users get connected to friends, friendsters, fakester or even fraudster. This is one other reason users of most of SNS have hundreds of friends contributing to the community at different levels and making it necessary for SNS users to be actively keeping up with their networks even on the go.

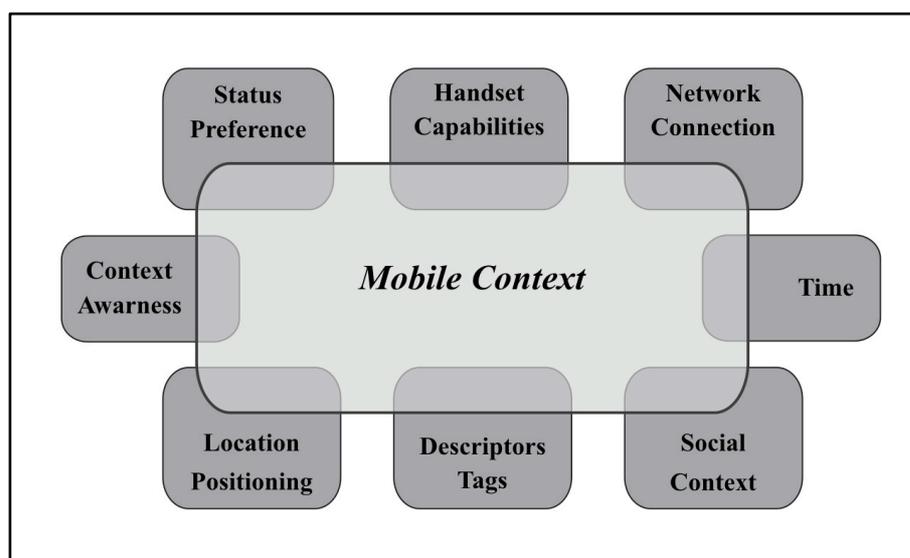
SNS remain active when the users are actively participating in creating, sharing and consuming information to and fro from SNS. As the next step MSN needs to get

integrated to mobile functionalities that would enhance the productivity of users involved in MSN.

Thus the above analysis of involvement with SNS would further help to create the basic grounds for performing research in the problem area by providing reference points to create the persona and use-cases for the new proposed application.

## Chapter 3 Involvement in Mobile Social Networking

Mobile Social Networking (MSN) represents the SNS, mobile carriers, and mobile content providers. There are more internet users on mobile phone than on PC. As the mobile phones are small personal devices that users can easily carry and provide useful additional information about the physical location, time, user context and preferences. As shown in *figure 6*, the mobile contextual information is generated from location positioning of mobile device, the time, fast network connection, descriptors tags that gives contextual information, advanced capabilities of mobile handsets, context awareness feature of mobile computing and some status preferences given by users (Johansson 2008) (Marcia Villalba 2009).



**Figure 6:** Relevant features of MSN

Source: Modification from (Johansson 2008) and (Marcia Villalba 2009)

The Mobile social networks provide the latest statistics from e-Marketers, the total MSN users. From *table 1* it could be interpreted that mobile phone subscribers and mobile internet users have risen from 2007 to 2011 resulting into tremendous amount of growth in MSN user i.e. from 82 millions to 554 millions users (Gauntt 2008). Thus, growing number of MSN users and mobile context contributes in enhancing MSN.

As the number of SNS grew from time to time, some of the major SNS in today's world are listed in *Appendix 1*. As far as known the first SNS site began in 1993, known Match.com as the first online dating site. Then came Six degree, Cyworld,

**Table 1:** MSN users worldwide

MSN Users Worldwide (in millions), 2007 - 2011					
	2007	2008	2009	2010	2011
Mobile phone subscribers *	3,078	3,417	3,697	3,894	4,150
Mobile internet users	406	490	596	757	982
<b>MSN users **</b>	<b>82</b>	<b>147</b>	<b>243</b>	<b>369</b>	<b>554</b>

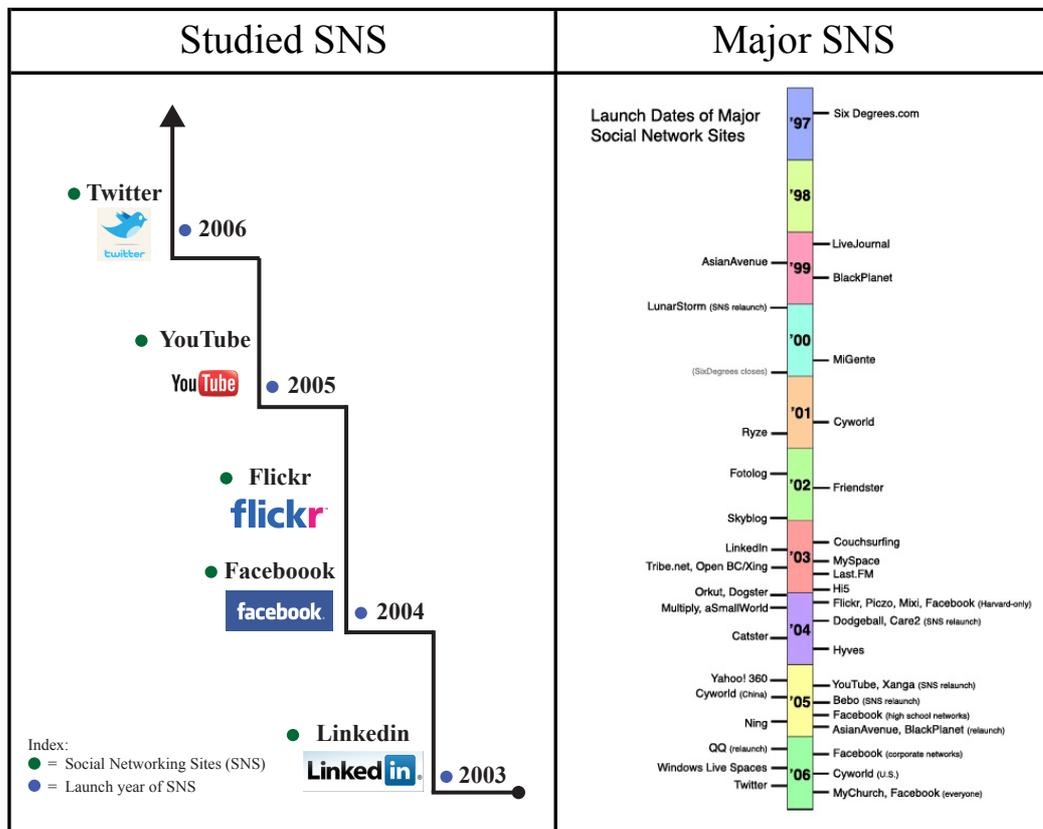
\* data for 2007-2010 from European information Technonology Observatory (EITO), March2007

\*\* registered users (identified by their mobile number) who create, edit and view personal content using their phone

Source: MSN Users worldwide statistics obtained from (Gauntt 2008)

Ryze as first business related SNS, Friendster – for social friends, LinkedIn, MySpace, Hifi, Xing, Flickr - for photo sharing, Facebook – for socialising, Orkut, Yahoo 360, YouTube – for video sharing, Bebo, Twitter – message based service and many more (Boss 2009) (Social networking 2008). The major SNS as listed in *table 2* and some of them are further studied to understand the UI transition from web to mobile UI.

**Table 2:** SNS and their launch year



Source: Modification from (Boyd and Ellison 2007)

## 3.1 SNS on Web and Mobile

### 3.1.1 SNS for Leisure and Social Activity – Facebook and Twitter

SNS for leisure and social activities are mostly famous and widely used by everyone who seek to connect with friends and family. Such SNS also allow users to find lost connections and to build new connections. It keeps their users active by giving different options to share, gain and develop communications.

There are many SNS belonging to these categories and some of them common among users are – Facebook, Twitter, Orkut, MySpace, Bebo, Cyworld, Friendster, Google Buzz, etc.

#### **Facebook**

*Available on* - iPhone, Nokia phones, Google Android phones, BlackBerry.

*Facts* - Founders of Facebook application are Mark Zuckerberg, Eduardo Saverin, Dustin Moskovitz and Chris Hughes. They developed the application in February 2004; at that time they were fellow computer science students. Facebook currently has 500 million active users (users who have returned to the site in the last 30 days) as stated on Facebook press website on March 2011. Interestingly Facebook application is considered to be the most actively used SNS worldwide. Facebook is one of the most trafficked sites in the world and had to build infrastructure to support this rapid growth (Facebook 2011). The *table 3* provides the URL links to login on web or mobile.

*Features* - Facebook website is free to users and generates revenue from advertising, such as banner advertisements on the websites. Facebook has always focused on giving its users control over their experience so they can express themselves freely while knowing that their information is being shared in the way they intend. Facebook as a SNS is used for socialising, maintaining and making new friends. On Facebook users create profile with photos, lists of personal interests, contact information, birthdates and other personal information. Communication with friends can be done through private or public messages or chat. Users can create and join interest groups and like pages (Facebook 2011) (Piskorski et.al. 2008).

**Table 3:** Facebook url links and logo

URL links	Logo
Web - <a href="http://www.facebook.com">www.facebook.com</a> ; Mobile - <a href="https://m.facebook.com/">https://m.facebook.com/</a>	

(Source: facebook)



**Figure 7:** Transition of Facebook services from web to mobile UI

*Transition from mobile to web UI*

As shown in *figure 7* Facebook's web and mobile UI are compared and transition of information from web to mobile UI is highlighted to understand the construction of Facebook UI on mobile.

1. Mobile UI - Facebook on mobile has been divided in different views to give good visibility to the users of all the content. The news feed section has been arranged in a separated UI, this view make it easy for the users to quickly glance latest feeds from their friends, read and give comments on their feeds. In the top part of the UI there is an input field where user can add new status.
1. Web UI – It is an easy to read and has well organized UI; here the news feeds are the first visible content. As users are mostly interested in knowing what their friends are doing at this moment. Also status can be updated from the input field above the news feed section.
2. Mobile UI - The icon on the top left corner of the UI opens a view with icons buttons like profile, friends, inbox, chat, requests, event, photos and notes this view helps to navigate into other application of Facebook. In the bottom part of this view is the area were notifications are collected and displayed in highlighting red number. User interacts with the notification that opens as an overlay on the current view.
2. Web UI –There are icons button on top part of webpage and also on left side under the profile picture both give access to navigate into different applications of Facebook. Notifications are seen on top of the view with numbers of new items highlighted in red.
3. Mobile UI - Personal page is on a separate view, which shows content, posted by user or related to the user and is arranged on this view on time line. Tabs in bottom part of the UI give options to navigate to users wall, info or other applications posted by users on the Facebook.
3. Web UI – Personal page view is almost similar on mobile and web UI. The view on web UI also shows personal content of the users and the activities done by the users listed on time line. It has tabs to navigate into user’s wall, as well as info from other application that users might have connected with the service for example Flickr and Twitter updates can be linked into Facebook and they are viewed here on the personal page.

## **Twitter**

*Available on* - iPhone, Nokia phones, Google Android phones, BlackBerry.

*Facts* – The Twitter website was founded by Jack Dorsey and launched in 2006 for the world to explore. It is sometimes described as the SMS of the internet service. Twitter has gained notable popularity worldwide and it has 175 million users worldwide and 95M tweets written as per facts stated in twitter webpage on September 2010. Additionally, Twitter's usage usually spikes during prominent events (Twitter 2010). The *table 4* provides the URL links to login on web or mobile.

*Features* – Twitter is a social networking and micro-blogging service that allows its users to send and read other user messages called tweets. Users can send and receive tweets via the Twitter website, Twitter applications, or by Short Message Service (SMS) available in certain countries. Tweets are text-based posts of up to 140 characters. Tweets are publicly visible by default; however senders can restrict message delivery to a specific friend list. Twitter is also used for creating a live stream of useful information on your website or blog. Education institutions, conferences and news events, extensively use services by the use of Twitter hash-tag labels. Twitter is localized to use in many different languages like French, Italian, Spanish, German, and Brazilian Portuguese (Twitter 2010).

### *Transition from mobile to web UI*

As shown in *figure 8* Twitter's web and mobile UI are compared and transition of information from web to mobile UI is highlighted to understand the construction of Twitter UI on mobile.

1. Mobile UI – Updates from friend's tweets is listed in a separate view and there are options available for navigating to write or respond to tweets. On the bottom of the screen in the tool bar where options to view friends list, write a message, to mention, add to favourite and search can be found. While on the top of the view there is add button to upload add new tweet.

1. Web UI – Twitter web UI is made very easy to read and simple to understand. Friend’s tweets updates are listed on the main view on time line with latest tweet on top of the list.

**Table 4:** Twitter url links and logo

URL links	Logo
Web - <a href="http://www.twitter.com">www.twitter.com</a> ; Mobile - <a href="https://m.twitter.com/">https://m.twitter.com/</a>	

(Source: twitter)



**Figure 8:** Transition of Twitter services from web to mobile UI

2. Mobile UI – Action to a tweet is overlaid on the tweet to give options to interact while still being on the view. These options are to re-tweet, to reply, add favourite and add contact and to return back to tweets list.

2. Web UI – Options to interact with a tweet is given just under the message giving easy access to interact. The options are to make favourite, retweet, reply and time stamp.

### **3.1.2 SNS for Professionals and Business - LinkedIn**

These kinds of SNS used by professionals seeking business connections, communications for growth of their business contact or for seeking job opportunities.

SNS for business purpose category are - LinkedIn, Xing, Focus, Qapacity, Ryze, Talkbiznow, Yelp, etc.

#### **LinkedIn**

*Facts* - Reid Hoffman founded LinkedIn service along with the users from PayPal and Socialnet.com at Mountain view, CA, USA. The website was launched in May 2003. LinkedIn now has a dedicated application for smart mobile phones like iPhone, BlackBerry for the users to access the service on the go (LinkedIn Corporate Press Centre 2010). The *table 5* provides the URL links to login on web or mobile.

*Features* - LinkedIn has a very strict model of adding contacts as it requires both the person adding a contact and the contact themselves to approve the request. To make this bond stronger the users in LinkedIn, focus on professional users aiming on creating networks of co-worker and other business associates. It allows users to seek for jobs, search experts in a particular area, and also allow making contact with other professionals through a chain of trusted connections.

#### *Transition from mobile to web UI*

As shown in *figure 9* LinkedIn's web and mobile UI are compared and transition of information from web to mobile UI is highlighted to understand the construction of LinkedIn UI on mobile.

1. Mobile UI - Mobile interface for LinkedIn has been divided into different views to make it visually organised, grouped and display information that is important to the user. The home screen for mobile UI contains different buttons showing activities, which helps to filter the content and to navigate easily. The unread or

new updates are highlighted and marked by number over the tabs, helping users to notice new content. Users name and last login information is displayed on bottom part of the screen.

**Table 5:** LinkedIn url links and logo

URL links	Logo
Web - <a href="http://www.linkedin.com">www.linkedin.com</a> ; Mobile - <a href="https://m.linkedin.com/">https://m.linkedin.com/</a>	

(Source: linkedin)



**Figure 9:** Transition of LinkedIn services from web to mobile UI

1. Web UI – The main view has tabs on the top of the page that open up into new view. Under these tabs is user's profile picture, a field to update status or add links.
2. Mobile UI - All updates tab opens a view where updates from contacts and company are listed with newest on top. Users can comment on the update in 140 characters. On the view there are two tabs in the bottom part of the view for user to filter the displayed content by selecting either favourite contacts or all contacts. The purpose of this kind of update is to receive regular update from your connections while on the go (Duncan 2008).
2. Web UI – Updates are listed on the main view; updates from the contacts and company are grouped separately. Users can interact with contacts update, by posting actions to like, comment, reply privately.

### **3.1.3 SNS for Entertainment and Service – Flickr and YouTube**

These kinds of SNS are used for the purpose of entertainment and service that would facilitate specific purpose of the user. Many of these SNS have become favoured among users and are often used by them. Some of the purposes these SNS cover are –

Photo and Video sharing for easy and hassle free uploading and viewing content from friends or general public, with the purpose of entertainment and maintaining collection of self-generated creations, e.g. SNS - *Flickr, Picasa, YouTube* and *Vimeo*.

Music sharing service is common among many users as it is easy to share and listen to collections of music from all around the world, e.g. SNS - *Spotify, Lastfm, Playlist.com* and *Buzznet*.

Social Bookmarking allows users to share, collect links and information that match their interests like scholars who are into research, e.g. SNS – *StumbleUpon* and *Delicious*.

Location based services, which reveals location of the user as well as other friends for the purpose of meeting or socializing or to find friends in the same location. These kinds or services are only used as MSN, e.g. Services – *Foursquare* and *Gowalla*.

## **Flickr**

*Available on* - iPhone, Nokia phones, Google Android phones, BlackBerry.

*Facts* - Ludicorp a Vancouver-based company that launched Flickr in February 2004 and later in March 2005 was acquired by Yahoo! Corporation. Flickr claims to have hosted more than 4 billion images in October 2009 as noted in Flickr's press webpage. In 2009 Flickr announced a partnership with Getty Images; specially selected users could submit photographs for stock photography usage and receive payment for their submissions (Flickr 2010). The *table 6* provides the URL links to login on web or mobile

*Features* - Flickr has an easily noticeable unique aim of archiving and sharing of images and video online. The basic feature of Flickr is to allow users to post images that become either private or public. Flickr also allows its users to share, tag, add contacts, join Flickr groups and receive updates. Flickr login allows you to follow others but does not require you to create new content. These new updates usually tend to attract users to view more items and comment them too. Mobile Flickr becomes a natural extension for the smart phones with camera. Anytime, anywhere use of camera to capture memories or actions and uploading photos at very time and location they happen, directly from the smart phone becomes easy. Checking out the latest uploads and comments from friends and family is easy on the mobile Flickr even if on move (Flickr 2010).

### *Transition from mobile to web UI*

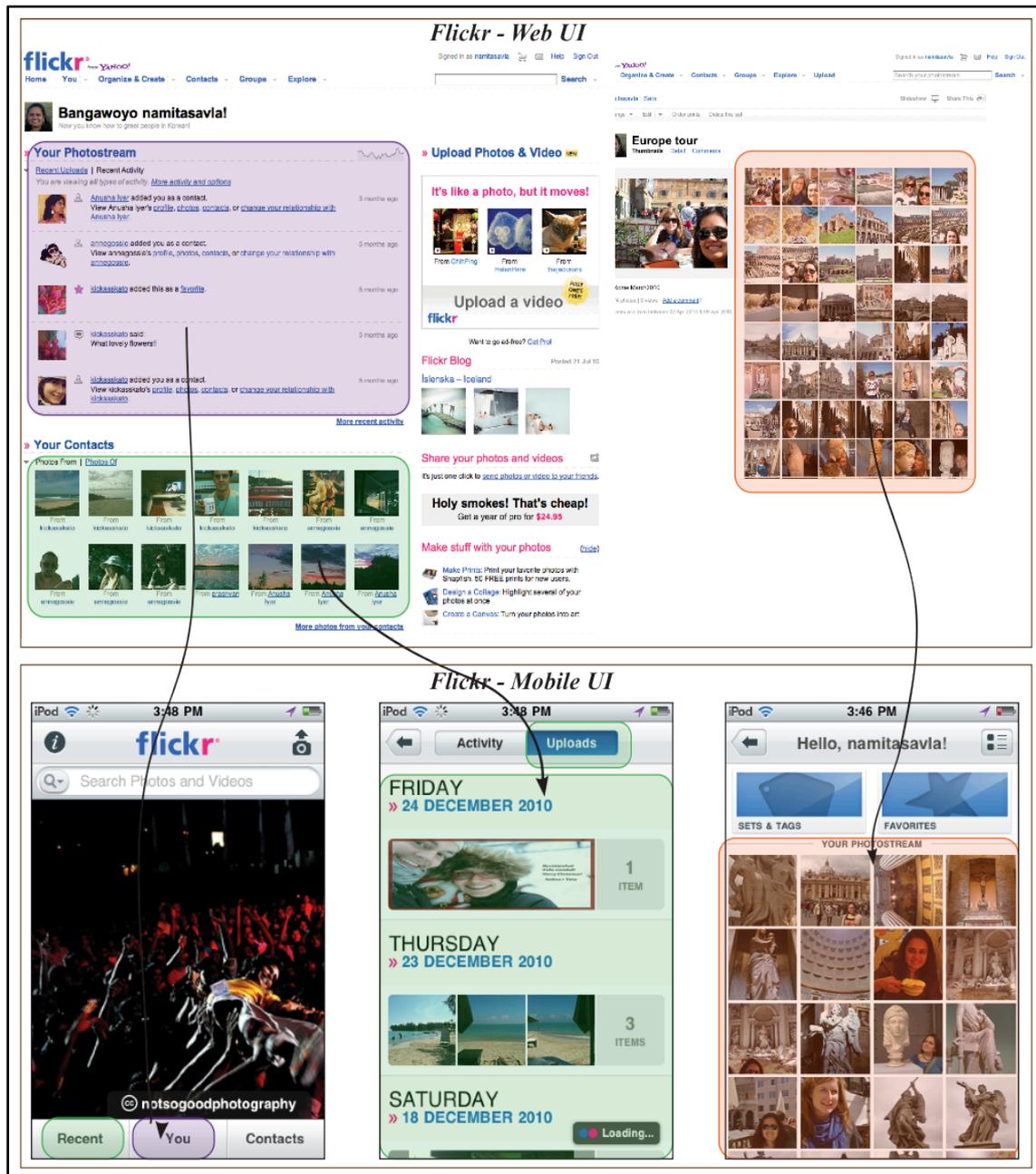
As shown in *figure 10* Flickr's web and mobile UI are compared and transition of information from web to mobile UI is highlighted to understand the construction of Flickr UI on mobile.

1. Mobile UI –Flickr's home view slide shows some of most liked pictures from the community and options to navigate to views 'Recent', 'You' and 'Contacts'. The 'Recent' view show updates from friends and shows thumbnails of posted photos with count and time stamps. On top part of UI are the tabs to see activities on my photos and uploaded photos from my friends in different views.

**Table 6:** Flickr url links and logo

URL links	Logo
Mobile - <a href="https://m.flickr.com/">https://m.flickr.com/</a> ; Mobile - <a href="https://m.flickr.com/">https://m.flickr.com/</a>	

(Source: Flickr)



**Figure 10:** Transition of Flickr services from web to mobile UI

1. Web UI – the main view shows all the updates from my contacts and activities on my photos. On the right side of UI displayed some of most liked public photos and videos from the community.
2. Mobile UI – Users uploaded photos are displayed under view ‘Photo Stream’ with options to make sets, add tags and to mark photos favourite. The uploaded photos are displayed in a grid with option to view them in full screen mode. When a photo is selected it is viewed in the full screen; also shows the next coming photo is shown as thumbnail.
2. Web UI – The view shows the sets and group of photos user has uploaded with option to view these photos in original size. When viewing these photos user can comment and like the photo.

## **YouTube**

*Available on* - iPhone, Nokia phones, Google Android phones, BlackBerry.

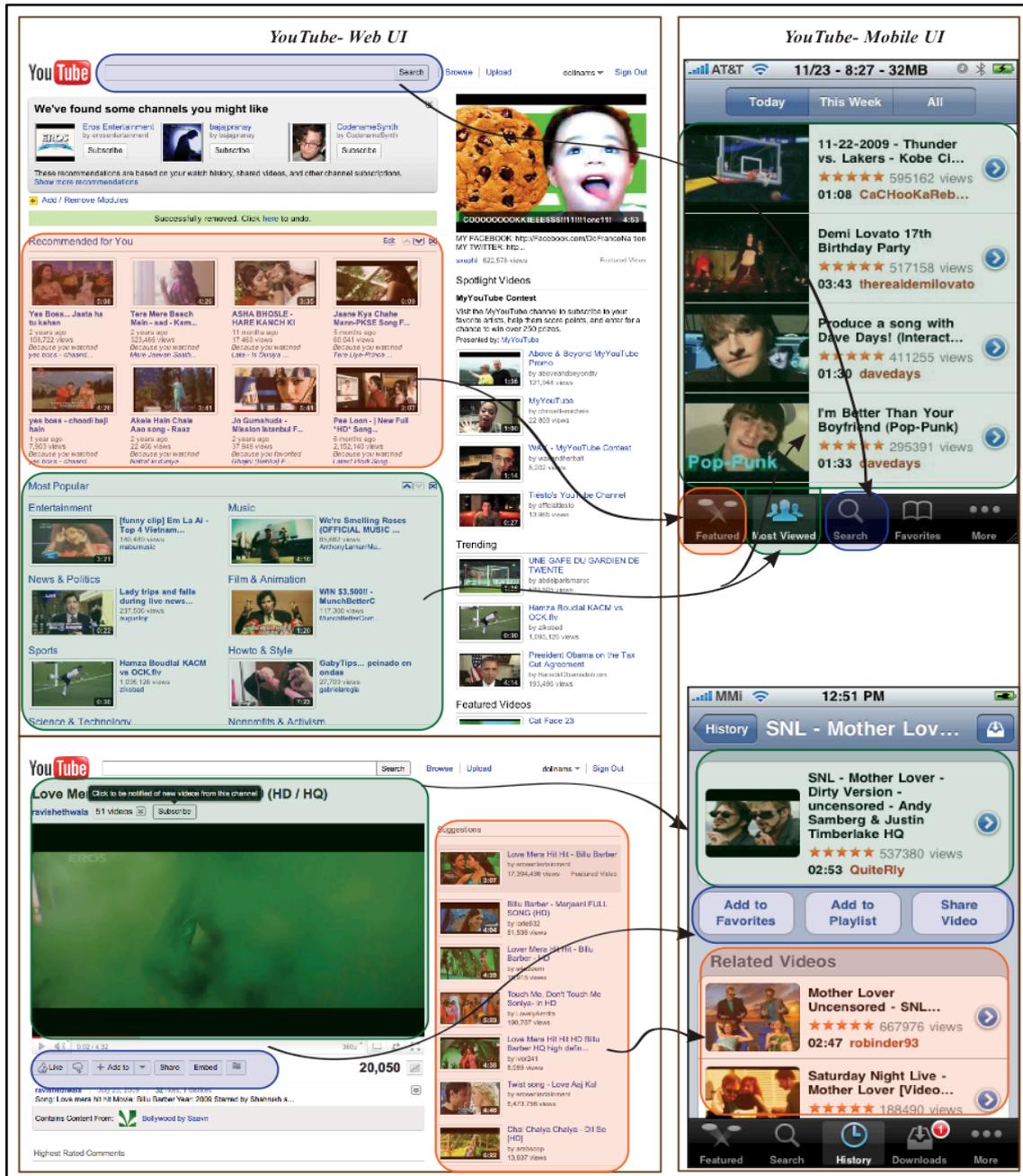
*Facts* - YouTube was created by three former PayPal employees and launched in February 2005. In November 2006, Google Inc., bought YouTube, LLC. It uses Adobe Flash Video technology to display a wide variety of user-generated video content. YouTube was awarded a 2008 George Foster Peabody Award (CrunchBase 2010). The *table 7* provides the URL links to login on web or mobile

*Features* - YouTube is a video-sharing website on which users can upload, share, and view videos. The wide variety of video content includes movie clips, TV clips, music videos and short original videos from amateurs. YouTube with its simple interface, made it possible for a common user to upload a video that entire world could watch. The wide range of topics covered by YouTube has turned video sharing into one of the most important part of social networking. YouTube on mobile is fast and easy way to upload videos directly from the phone immediately after they have been created. This process is made more easy by the new technology smart mobile phone devices The web interface of the YouTube service is available in 24 different languages, to make it possible for users around the globe to watch free online videos and upload new videos in their preferred language (CrunchBase 2010).

**Table 7:** YouTube url links and logo

URL links	Logo
Web - <a href="http://www.youtube.com">www.youtube.com</a> ; Mobile - <a href="https://m.youtube.com/">https://m.youtube.com/</a>	

(Source: Flickr)



**Figure 11:** Transition of YouTube services from web to mobile UI

### *Transition from mobile to web UI*

As shown in *figure 11* YouTube's web and mobile UI are compared and transition of information from web to mobile UI is highlighted to understand the construction of YouTube UI on mobile.

1. Mobile UI – The home view of YouTube displays a list of videos uploaded by the community with tabs to see videos from today, this week and all. The mobile UI is made simple and easy to navigate by adding tabs in the toolbar that opens into different views like featured videos, most viewed videos, search, favourite etc.
1. Web UI – The main view of YouTube shows videos from the community divided in different categories like recommended for you, most viewed, spotlight and most popular. The possibility to personalize view allow user to add or remove category to see updates from their choice. On top of UI is field to search videos.
2. Mobile UI – Tapping on the list item takes users to view the video in full screen view. With controls overlaid on the video, they disappear in few seconds when not in use. Once the video is viewed the UI changes to display details of the video where users can mark the video like, add to favourite, add to playlist and share video. Also a list of related video is recommended to the users that they might like to view.
2. Web UI – On selecting a video it opens in a new view where user can view the video on the smaller screen, expand the screen or view it in full screen. The options to mark the video are just below the video clip they are to like or unlike, add to playlist, mark favourite, share, embed, flag and a count showing number of times videos is viewed. On the right side are the suggestions that viewer might like to view after the current video. Under the video are list of comments posted by users and a field to add new comment.

### **3.2 Prioritization of SNS Contents for Optimized MSN Application**

As there are many dedicated SNS available for user to explore, *table 8* shows the comparative study to find which MSN content is common among some of the

commonly used SNS. The table columns show SNS divided into two parts for mobile and web UI and in columns are SNS with their types like Facebook and Twitter as socializing, LinkedIn as business, Flickr as photo sharing, YouTube as video, Spotify as music and Tripit for travel. Similarly the table rows show MSN content like newsfeed, status updates, events, wall, message, photos, videos, personal information, groups, friends list, music, chat, maps and links.

The red colour checked field in the above table shows the SNS's mobile UI have specific content on to their sites, such as LinkedIn, Facebook, Twitter and Tripit have status updates on mobile UI. Whereas the unchecked field shows that the SNS do not have that specific content in their sites, such as Flickr, YouTube and Spotify do not have status update contents. While the blue colour checked field shows the SNS's web UI have specific content on to their sites, such as LinkedIn, Facebook, Twitter, Tripit and Flickr have status updates on web UI. Whereas the unchecked field shows that the SNS do not have those specific content in their sites, such as YouTube and Spotify do not have status update contents.

**Table 8:** Common mobile social networking content

		SOCIAL NETWORKING SITES (SNS)												RESULTS				
Type of SNS		Business		Socializing				Travel		Photos		Videos		Music				
Social Networking Sites		LinkedIn		Facebook		Twitter		Tripit		Flickr		YouTube		Spotify				
Logos of SNS																Common MSN Content		
Mobile and Web UI		Mobile	Web	Mobile	Web	Mobile	Web	Mobile	Web	Mobile	Web	Mobile	Web	Mobile	Web	Mobile	Web	Common MSN Content
MSN UI CONTENTS	Status Updates	✓	✓	✓	✓	✓	✓	✓	✓		✓					4	5	2
	Wall				✓											-	1	3
	Messages	✓	✓	✓	✓	✓	✓									3	3	2
	News Feeds	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7	7	1
	Events			✓	✓		✓									1	2	3
	Photos			✓	✓					✓	✓					2	2	3
	Videos			✓	✓					✓	✓	✓	✓			3	3	2
	Personal Information	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	7	7	1
	Groups		✓	✓	✓		✓			✓	✓		✓	✓	✓	3	5	2
	Friends list	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	6	7	1
	Music				✓									✓	✓	1	2	3
	Chat			✓	✓											1	1	3
	Maps			✓		✓		✓	✓	✓	✓					4	2	2
	Links		✓		✓		✓				✓	✓	✓		✓	1	5	3
		5	7	11	13	6	8	5	5	7	8	4	6	5	6	Score		Rank

Index: (1 = most common ; 2 = medium common ; 3 = least common)  
 Source: Own observation and analysis of MSN

Further, the total score column and row wise is obtained by adding the checked field respectively. The total score for status updates content on web UI is 5 and on mobile UI is 4, which means in web UI out of 7 SNS 5 SNS have status updates content in their sites and in mobile UI out of 7 SNS 4 SNS have status update content into their sites. Similarly the total score for LinkedIn SNS on mobile UI is 5 and on web UI is 7: which means out of 14 contents, 5 contents are available in mobile UI out of 14 content, 7 contents are available on web UI of LinkedIn. Lastly based on the total score obtained, the MSN contents were classified into three ranks i.e. maximum total weightage value is assigned to 1<sup>st</sup> rank as most common, the minimum total weightage value is assigned to 3<sup>rd</sup> rank as least common and the remaining in between total weightage value is assigned to 2<sup>nd</sup> rank as medium common.

The most common MSN content on the bases of total score of SNS is news feeds, personal information and friends list and second common MSN content are status updates, messages, videos, groups and maps. Whereas the least common SNS content are wall, events, photo, music, chat and links.

The above studies provide valuable information about the common UI content used on MSN, which would be assimilated while designing UI for the proposed application. Thus understanding from the above study will aid in designing UI that would be easy to understand also will help users to be productive and actively involved in MSN.

### **3.3 Comparison of Functional and Visual UI Elements of MSN**

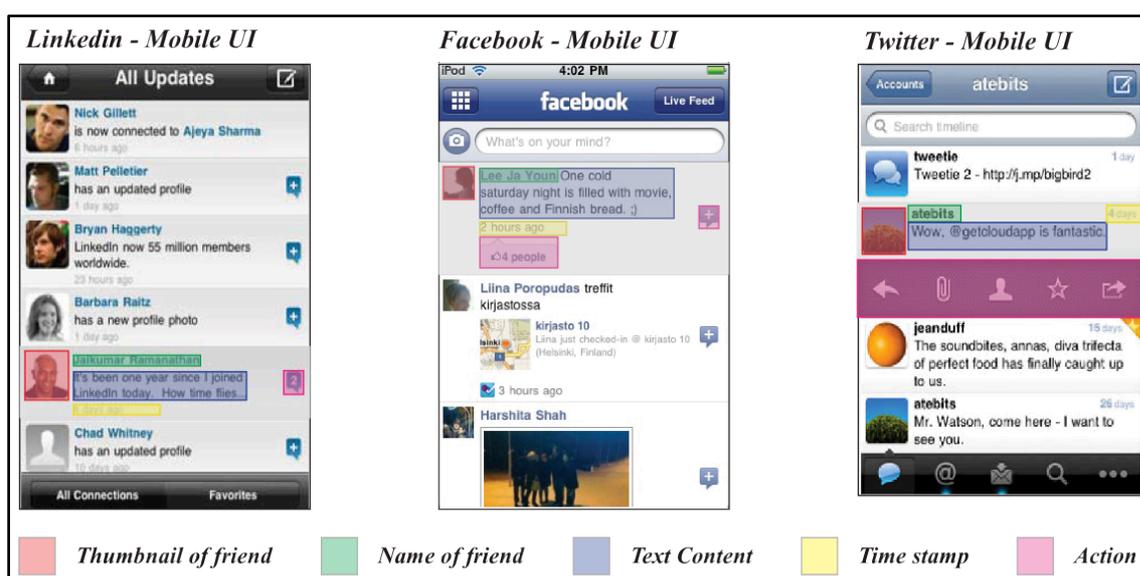
The transformation from web to mobile UI in the previous section helps to understand use of different UI elements, integration of UI functionality, Visual and interactive feedbacks by comparing different mobile views, functional and visual UI elements; like update view, content view and my view.

#### **3.3.1 Update View**

Comparing update views from mobile UI's of LinkedIn, Facebook and Twitter – A list of items are highlighted to see the visual difference among the three UI. As shown in the *figure 12* the visual components are marked in highlighting colours for comparison and to understand the requirement of each of those components and

importance to the users while interacting on mobile UI. The list item from update view contains following elements:

*Thumbnail, Name and Context text* – The *thumbnail* of a friend gives a visual feedback to the user even before reading friends name. The *name* of a friend is marked in highlighted text to separate it out from the content text. The *context text* mostly includes comments or status update of the friend, which mostly has limited amount of visibility and gets truncated if exceeds.



**Figure 12:** Comparison of updates view UI with different MSNA

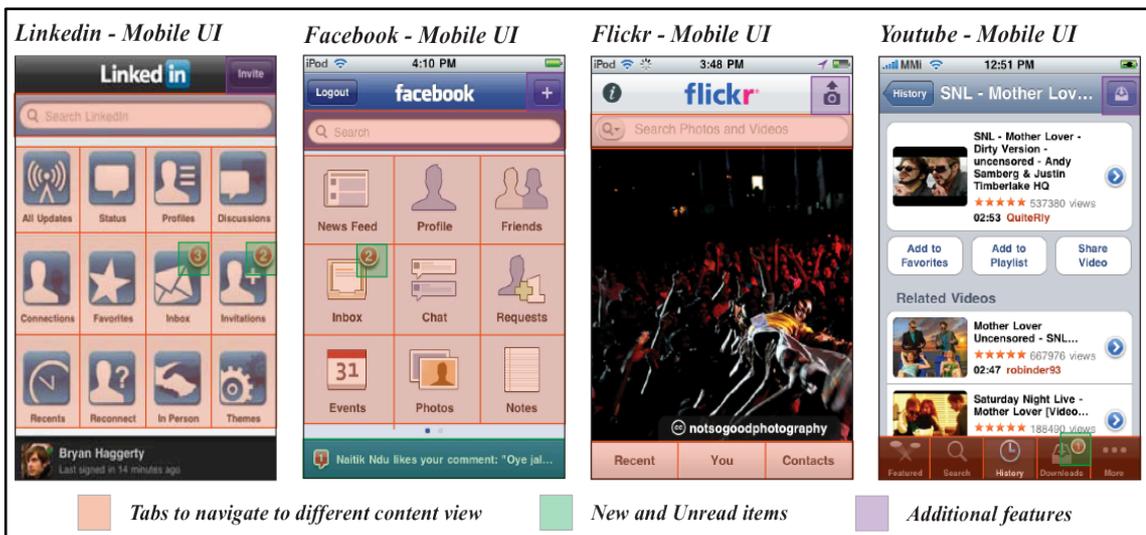
*Time stamp* - It is always visible on the list item for the user to know when was the update posted, also it helps the UI to arrange on the time line as last received update is on the top of the list.

*Actions* - The list item make the UI interactive by having actions attached with list item that makes the UI more useful and convenient. The actions available are - to reply, to like, to comment, add, mark it favourite, forward. This kind of interaction is either an overlay or appears on long press or as a drop down list; making it convenient for the user to interact while still remaining on the list view.

### 3.3.2 Content View

Content view of mobile UI from LinkedIn, Facebook, Flickr and YouTube are compared to understand how different SNS handle the extensive content on small mobile screen. As shown in *figure 13* the content view is mostly divided in different views for convenience of visibility of content and there is a common page to navigate to these individual views. The highlighted elements in content view are as under:

*Buttons/Tabs* - To navigate into different content views, the buttons with icons are arranged in grid, which helps to navigate into individual views. Some SNS (like LinkedIn, Facebook) have several different types of content views; they have dedicated view where those contents are arranged. While others SNS (Flickr, YouTube) with few content views have tabs in the bottom part of the UI that are usually always available for the user to navigate into different views. The search functionality is also available to user on top of the content grid or integrated in the tabs.



**Figure 13:** Comparison of content view UI with different MSNA

*New and unread items* - This feature in SNS on mobile UI is very useful to highlight content that is new or not read. Those are usually highlighted in red bubbles with number of new items on top of the content. The colour and placement catches attention of the user and helps visibility of new content on busy UI.

*Additional features* - Usually situated on top right corner of the UI allows the users to navigate into other related applications to add or create new content. For e.g. In Flickr the additional feature button takes user to camera application.

### 3.3.3 My Profile View

My profile view from mobile UI's of LinkedIn, Facebook, Twitter and Flickr is compared. My profile view is the UI where user's personal information and details are displayed. On this view the content generated by the user is collectively presented on time line and users can personalize to their desire. As shown in the *figure14*, the view of various SNS has similar basic structure though the content is different. There are two major highlighted areas in my view. The highlighted items from my profile view contains following elements:



**Figure 14:** Comparison of my personal view UI with different MSNA

*Personal Information* - This area shows information like the users photo/avatar, thumbnail, name, designation and username. On some SNS the thumbnail is interactive which allows user to change their picture and edit personal information.

*User Generated Content* - Mostly this area shows list of content generated by user and it is arranged, as the last generated content is first on list. The other way of representing the users content is in tabs or buttons like recent activities, connections. Usually this

information is displayed as a list and some times in grid. For example in Facebook the user-generated content is displayed on a list with actions. While on Flickr the uploaded photographs are displayed in a grid of thumbnails.

### 3.4 Prioritization of UI Elements for Optimized MSN Application

As there are many dedicated SNS available for users to explore, *table 9* shows the comparative study to find priority in MSN UI elements from some commonly used SNS. The below table columns show SNS and their types like Facebook and Twitter as socializing type of SNS, LinkedIn as business, Flickr as photo sharing, YouTube as video, Spotify as music and Tripit for travel. Similarly the rows show UI elements used on MSN application like user thumbnail, user name, time, date, like or dislike, comments, information or message, tag or favourite, remove, photos, video and links.

The checked field in the table shows, the SNS have specific MSN UI element on to their sites, such as Facebook, Flickr, YouTube, Spotify have like / dislike UI element. Whereas the unchecked field shows, the SNS do not have that specific MSN UI element in their sites, such as LinkedIn, Twitter and Tripit do not have like / dislike UI element.

**Table 9:** The priority of MSN UI elements in different SNS.

		SOCIAL NETWORKING SITES (SNS)						RESULTS		
		Business	Socializing		Travel	Photos	Videos			Music
Type of SNS		LinkedIn	Facebook	Twitter	Tripit	Flickr	YouTube	Spotify		MSN UI Element Priorities
Social Networking Sites		Linked in	facebook	twitter	Tripit	flickr	You Tube	Spotify		
Logos of SNS										
MSN UI ELEMENTS	User Thumbnail	✓	✓	✓	✓	✓	✓	✓	7	1
	User Name	✓	✓	✓	✓	✓	✓	✓	7	1
	Time	✓	✓	✓	✓	✓	✓	✓	7	1
	Date	✓	✓	✓	✓	✓	✓	✓	7	1
	Like/dislike		✓			✓	✓	✓	4	2
	Comment	✓	✓	✓	✓	✓	✓	✓	7	1
	message/Info	✓	✓	✓	✓	✓	✓	✓	7	1
	Tag / Favourite	✓	✓	✓	✓	✓	✓	✓	7	1
	Remove	✓	✓	✓		✓		✓	5	2
	Photos		✓			✓			2	3
	Video		✓				✓		2	3
	Links	✓	✓	✓		✓	✓		5	2
									Score	Rank

Index: (1 = most common ; 2 = medium common; 3 = least common)

Source: Own observation and analysis of MSN

Further the total score row wise in the above table is obtained by adding the checked field respectively. For example the total score for like / dislike MSN UI element is 4, which means out of 7 SNS, 5 SNS have like / dislike MSN UI element in their sites. Lastly based on the total score obtained, the MSN UI elements were classified into three ranks i.e. maximum total score value is assigned to 1st rank as most common, the minimum total score value is assigned to 3rd rank as least common and the remaining in between total score value is assigned to 2nd rank as medium common.

Based on the total score the most common MSN UI element are user thumbnail, user name, time, date, comments, information or message and tag or favourite. These top priority elements are usually seen on most of the MSN UI as they form the basis of the view. Second common UI elements are like / dislike, remove and links. Whereas, the least common UI element used in MSN are photo and video.

The above common and top priority UI elements are anticipated and used in the proposed MSN application for designing easy to read views. The application displaying to users the information they would like to see on those views while involved in MSN. Thus, the comparative study provides useful information about the common UI elements used in MSN, which will aids to build UI views for the proposed application.

## Chapter 4 Application ‘My SocioWorld’

### 4.1 User Centred Design Approach

User Centred Design (UCD) is an approach where, users and their needs are kept at the epicentre of the design process during the planning, concept, design and development of the application. Open and real value to the users and the society are achieved in UCD process by addressing basic human needs. UCD is a broad area covering different approaches such as human factors and ergonomics, participatory design, human-centered design process, usability measurements and inspections and design for user experience (Keinonen 2008).

UCD included early continuous contact with users, quantitative usability criteria, evaluations and iterative design process (Gould and Lewis 1985). In UCD fundamental needs, instrumental needs and user’s desires are considered as they play prime role in building logic of application. The active and early involvement of users as partners in design process leads to a deeper understanding of the actual design problem and helps designer to avoid unpromising design paths (Beaudouin-Lafon and Mackay 2003). The process guides designer to increase user’s pleasure, provide new kind of experiences and improves the profitability by penetrating in new areas (Eronen 2002). Some standard definition for HCD and UCD are stated below:

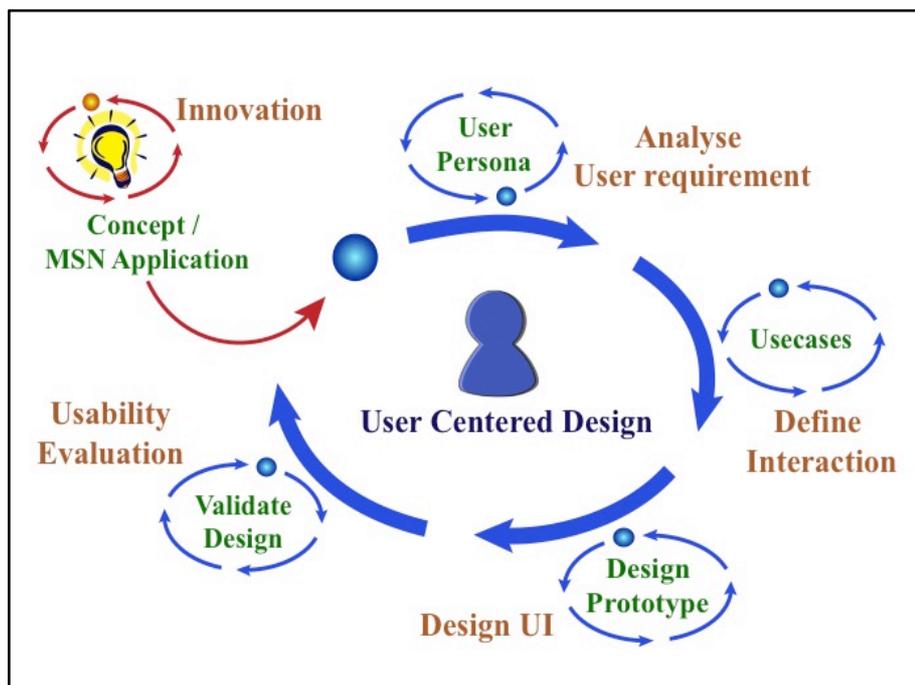
Human centred design (HCD) processes for interactive systems, (ISO: 13407 HCD 1999), states: "It is an approach to interactive system development that focuses specifically on making systems usable. It is a multi-disciplinary activity" (UPA 1991).

"User-Centred Design (UCD) is a user interface design process that focuses on usability goals, user characteristics, environment, tasks, and workflow in the design of an interface. It is an iterative process, where design and evaluation steps are built in from the first stage of projects, through implementation" (Henry and Martinson 2007).

The older approach of usability engineering to UCD has changed towards ‘design for user experience’ (UX) and pleasurable or emotional design. In this approach UX designers create novel kinds of experiences and values under the vast area of UCD.

This UX shift has made design as an activity, necessary to be considered while developing a product. In a design project the goals might appear blurred to the designer in the beginning but these goals are questioned and reformulated to define the real goals and UCD plays a vital role with productive involvement of users from beginning to end of the design process (Keinonen 2008).

The visual represents in the *figure 15* shows the UCD process followed in this research work to develop the proposed concept. On the bases of UCD and UX design process follows steps are considered - Analyses of user requirement by defining *user persona*, Defining interactions by building *user scenarios* and *use-cases*, Developing *UI designs* representing the concept and Usability Evaluation and validation by *usability testing*. These steps are discussed in details on the bases of UCD as mentioned below:



**Figure 15:** Design process using user centred design method

Source: Own visualization on the basis of (Sapag 2006), (UPA 1991) and (MSU 2011)

### **Defining - User Persona**

The design process starts by defining a user profile, which is, known as 'user persona'. This user profile is developed keeping in mind the potential target audience who would be mostly using the proposed application. A fictional character is constructed to understand user's goals, expectations, needs, behaviours and preferences which would

help the designer in guiding decisions about a product, such as features, interactions, and visual design (Telono 2005).

### **Building – Use-cases**

Building use-case depends on the needs and requirements of user. Typical use-cases are identified from users' normal day-to-day routine, which would help to describe the kind of tasks users might perform. Considering the needs, requirements and activities of the user, detailed use-case is drafted to accomplish most of the activities application needs to perform. These use-cases also outline the performance requirements from user side that affects the designing process.

To start making use-cases, a subset of work activities are identified and organized into a coherent product with a high-level overview on how information will flow throughout the application. Then the specified work activities are captured in further detail with goal-based use-cases. The use-cases show steps to accomplish task goals and the data needed to perform interactions. "The data definitions are the only elements of an interface that need to be determined in this phase therefore dialogs, buttons, tabs, labels, and all other specific interface elements are not yet mentioned" (Sapag 2006).

### **Design Process – The Concept**

The third phase of UCD is to design the UI, which is developed directly from the defined interaction. Product scope and interface organization are clear from the high-level information and UI components are clear from use-case steps and data. A primary concern with design is to not get locked into a single solution too early. To help prevent design traps, this phase is explicitly broken into two stages: low-fidelity prototyping and high-fidelity prototyping. Low-fidelity prototypes allow experimentation and rapid evaluation. High-fidelity prototypes provide refining designs and behaviour previews of the final product that specifies what is to be coded. Iterative user evaluations at both stages are geared to be fast and effective in improving UI, design feedback, rapid iterative evaluations, and usability evaluations.

Design process begins with brainstorming design concepts and metaphors keeping in mind the needs, expectations and requirements of the user. This leads to developing screen flows and interaction navigation models for the drafted use-cases. Several

iterations take place and the designs are checked by walkthroughs of design concepts. Low-fidelity design prototypes are created mostly using paper and pencil to quickly iterate different options (UPA 1991). Prototyping is next in this process giving opportunity to designers to explore design alternatives, test theories, and evaluate user satisfaction and performance prior to starting development of the product (Telono 2005).

### **Validating Designs – Usability tests**

Usability is defined (ISO: 9241-11 VDT 1998) as the "extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use" (W3C 2008).

Designs are evaluated at several phases in the entire design process. After every design prototyping and iteration a round of design performing usability test with the users takes place to understand if the designs need more iteration and to keep check on the design process. The objectives of the usability test are to check the product's usefulness, effectiveness, learn ability and likeability to the users. The evaluation is one process of taking users feedback over the iterated designs (Rubin 1994).

## **4.2 User Persona**

### **Introducing the user – 'Nandita Sen'**

*Name* - Nandita Sen, Female, 27 years

*Location* - Helsinki, Finland

*Profession* - Fashion designer is currently working in a developing design label.

*Hobbies* - Travelling, photography, cooking, playing badminton, watching movies, shopping, reading magazines and books.

*Nature* - Very social, smart, sensitive, fun loving, creative, outgoing, initiator and believes in enjoying life as it comes.



*Using SNS* - Facebook, Orkut, Twitter, Flickr, LinkedIn, YouTube, Foursquare.

*Daily Activities* - Nandita's daily routine begins early in morning at 6:00 am. She does yoga for half an hour and gets ready to go to work. After breakfast she leaves home for work, she travels by metro train that takes around 30 minutes to commute. She reaches her office at 8:30 am and gets busy at work. Nandita usually goes out for lunch with her work colleagues. She ends her workday at around 5:00 pm. After work usually Nandita meets up with her friends and they go either to cafe, shopping, exhibitions, movies or dinner. Usually she reaches home by 8:00 pm, but if she is out for dinner she would be home latest by 10:00 pm. She is off to sleep by 11:30 pm.

*Social background* - Being social person Nandita keeps up with her family members. She has many different groups of close friends that she maintains online, even when she is far from them. She actively communicates with them on the SNS, as she likes to be regularly in touch with almost all of them. But when time and location permits she does try to meet them in person.

*Social groups* - Family group, Hometown friends, University friends, Work friends from and Helsinki friends.

### **4.3 User Scenarios**

User Nandita's current scenarios and experience of using SNS on web through personal computer and MSN through smart phone are described below.

#### **4.3.1 Using SNS on Personal Computer**

User 'Nandita' is very active socially and has a big network of friends and family on different SNS. As shown in *figure 16*, she regularly communicates with her social groups and remains active virtually on several different SNS. She usually accesses the SNS from home or work through her personal computer several times in a day. She is very comfortable accessing SNS on web and their UI.

No sooner is she away from her computer, she is eager to get back online to check updates on her social networks since her absence. Being connected to friends is so important to her, that she feels restless on being offline for a long time, as she has no



**Figure 16:** Using SNS on web in current scenarios

Nandita using SNS on her PC at work or home and Nandita curious to know new activities on SNS

other way to check on her SNS when she is not next to her PC and is on the go. Nandita just wishes to change this scenario of her life and plans to buy a smart mobile phone for herself.

#### 4.3.2 Using SNS on Mobile Web or Mobile Application

Nandita buys herself a new generation smart phone touch mobile. As shown in *figure 17*, now she has 3G and internet connection in her mobile phone, which allows her to surf internet on the go. She feels happy about the fact that she can access her SNS through her mobile device anytime and anywhere even when she is away from her PC.

But soon she realizes that the user interface (UI) on her mobile is different from that on her computer. Also, having accounts on various SNS requires opening multiple web-browsers or specific application to access those services. She finds it tedious, time consuming and moreover, entering text through mobile is not fast or convenient. The main problems that she faces while accessing her SNS from mobile are the limited screen assets, higher cost of mobile communication, and higher level of intimacy.



**Figure 17:** Using SNS on mobile in current scenarios

Nandita bought a smart phone where she can access SNS, but she is not happy from MSN

Thus Nandita’s experience on using SNS on mobile does not make her comfortable or happy; as she expects it to be easy and all she wants is a comfortable way to check updates on her social networks on the go. Hence, her experience of using SNS on mobile was not as appealing as she had expected it to be.

#### 4.3.3 User Needs for Satisfied Mobile Social Networking

Nandita used her new smart mobile to access SNS, but was not satisfied with the experience and expects more out of the MSN use experience while socializing.

The users’ (in this case Nandita) needs and expectations for accessing MSN is a unified view, where all different SNS and their update could be viewed. It should be easy to access and add content from one place to all different SNS. Smart and quick methods of adding content like photos, videos, links and comments on SNS. It should not cost too much of data charges while socializing on MSN. It should be an intelligent system that learns ‘my usage’ pattern and displays the content in the view to ‘my needs’. It should be a beautiful and easy to understand User Interface on small mobile screen.

The above needs of user strongly influence the use of MSN on SPMD. Also it reveals that today's user scenario is not the efficient way of mobile socialising. Following the UCD methodology the proposed application would consider the user needs as design drivers for developing the concept. Further use-cases are designed keeping user needs and expectations as the base for developing the application. The use-cases UI design would provide solutions to display efficient ways of mobile socialising and the proposed application would be further perceived in a concrete application development process with usability evaluation and enhancements for a better user experience.

#### **4.4 About 'My SocioWorld' Application**

The increasing computing capability, power effectiveness, pervasiveness and bigger touch screen asset of personal mobile devices provide design opportunities for socio-emotional applications and services. Also demanding need for mobile social networking applications (MSNA) and software gives a positive motivation to develop a convenient method of interaction. With increase in number of different MSNA have made users realise the need of combining all these different applications together into one common application. As shown in *figure 18*, 'My SocioWorld' application covers the above need and proposes an optimized solution for mobile socialising

'My SocioWorld' application integrates different MSNA to represent them on UI, as an optimized solution that is easy to view and interact on mobile devices. This kind of integrated application will make it easy for users to view news updates from different friends present on multiple SNS, as now all the friends are integrated into 'My SocioWorld' application. So 'My SocioWorld' application is the optimized integrated solution of MSNA that would provide real-time information of my friends and family.

To add to the smartness and intelligent behaviour of 'My SocioWorld' application integration of already existing assets of mobile applications like, camera, photo gallery, contact card, maps, GPS, messages, calendar, clock and notes is done. This kind of mobile tools and asset integration makes it easy for users to interact seamlessly over different services from 'My SocioWorld' application. Also the UI designs of 'My SocioWorld' application are made to look familiar and intuitive in use. Therefore this

seamless integration will bring add on value and 'wow' factor that would enhance the usage of 'My SocioWorld' application.



**Figure 18:** The concept of proposed application - 'My SocioWorld'

The seamless integrations make it convenient for users to create content using mobile assets and then share with friends on different social services the entire process is done through 'My SocioWorld' application.

Also it would be easy for users to now consume and save content from 'My SocioWorld' to the mobile phone. 'My SocioWorld' also learns the usage and behaviour pattern of the users and displays the information that is most relevant to the users needs. Keeping in mind that the mobile social networking (MSN) can get very expensive for most of the users; 'My SocioWorld' application tries to help users by promoting the use of Wi-Fi network as much possible to reduce their data cost. Especially while uploading heavy files like photos, videos etc. the application by default suggests Wi-Fi network along with option to change, if user prefers to do consciously. If Wi-Fi is not available then transfers are queued up and whenever next Wi-Fi becomes

available 'My SocioWorld' just starts the queued transfers and notifies users when the transfers are done.

Hence, 'My SocioWorld' application proves to be an optimized, seamlessly integrated, smart, intelligent, cost efficient and effective solution. User can now actively participate in socializing by creating, editing, sharing and consuming information to and fro from the SNS.

## **4.5 User Use-Cases**

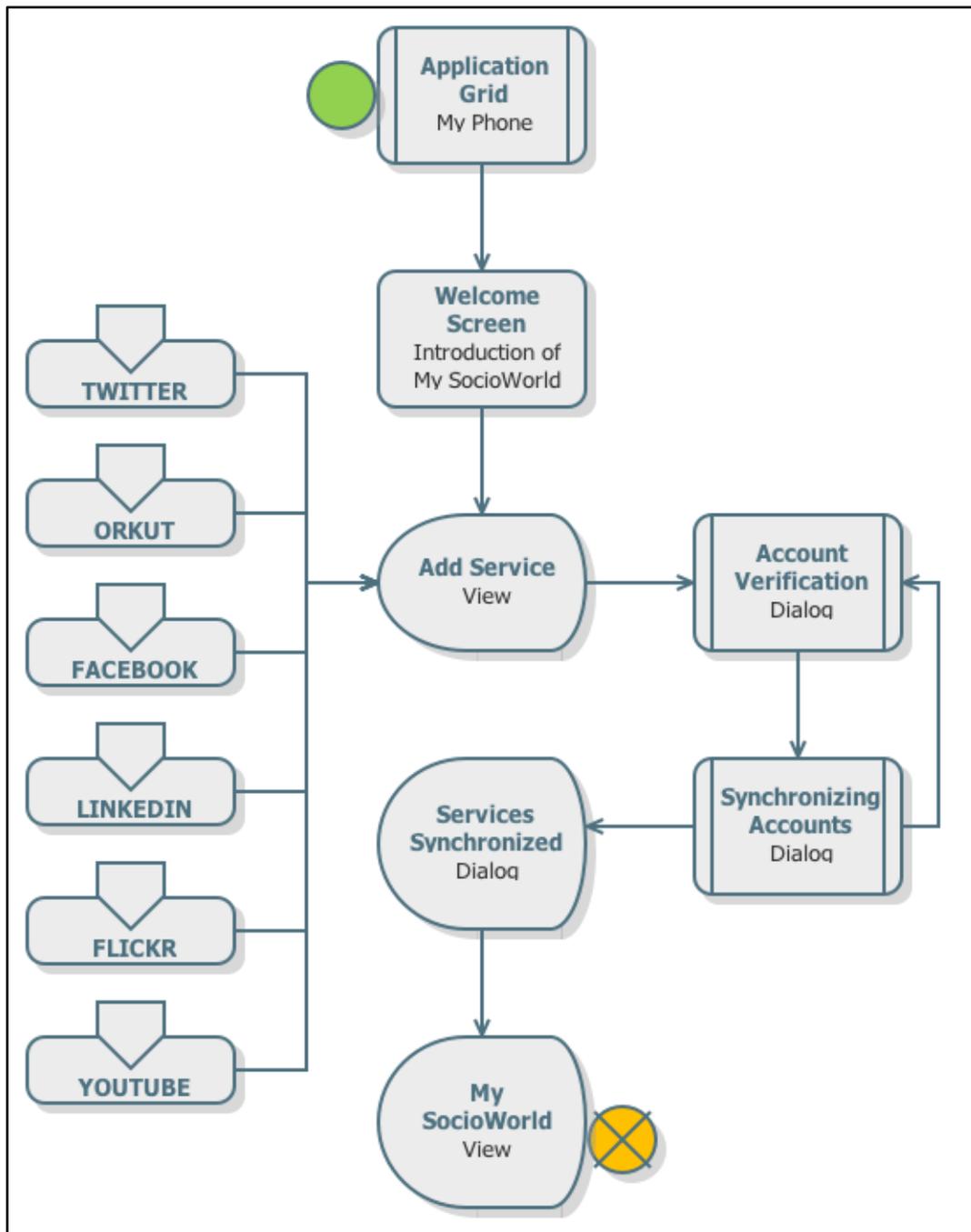
Six different use-cases from user Nandita's day-to-day life are shown below. These use-cases display different functionalities of the proposed application 'My SocioWorld'.

### **4.5.1 Use-Case 1: Installation and First Time Use**

Nandita has now downloaded new application called 'My SocioWorld'. Nandita thinks that the application looks promising and it states to be a common solution for convenient, easy and seamless way of social networking with all her friends spread on different SNS sites. Nandita finds this a very interesting application and is ready to give a look at the application.

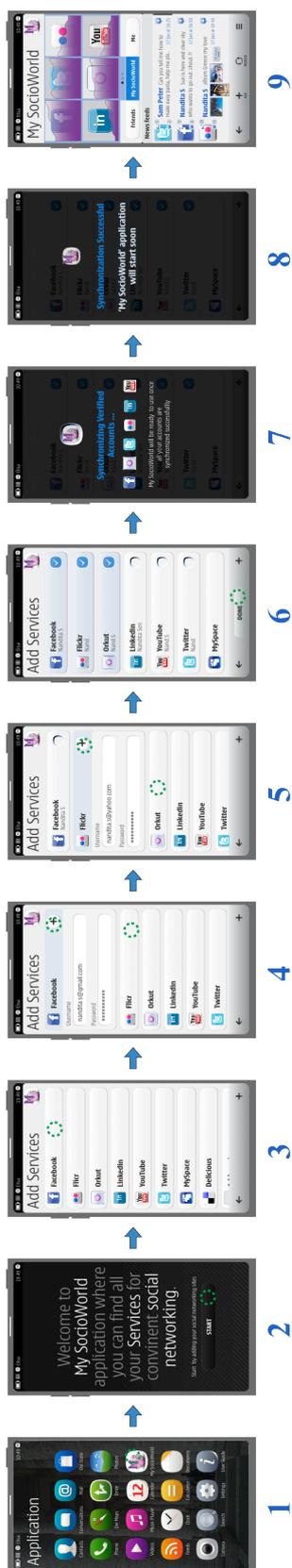
So, Nandita starts the application 'My SocioWorld' for the first time and finds there is a short welcome note that guides her to start using the application. She understands the welcome note, which tells her about the application and she starts by adding all her services in which she is actively involved. She selects Facebook services from the list and signs-in her username and passwords for it; similarly she adds all her SNS to 'My SocioWorld'.

The next step is to verify if the passwords are correct. Once verification is successful the synchronization of the signed in accounts starts. Synchronizing the accounts will bring all the content from the services and populate them on 'My SocioWorld'. After successful synchronization of services, the application 'My SocioWorld' is ready for Nandita to explore and use as her solution to convenient social networking with her various friends. Nandita is now ready to use 'My SocioWorld'.



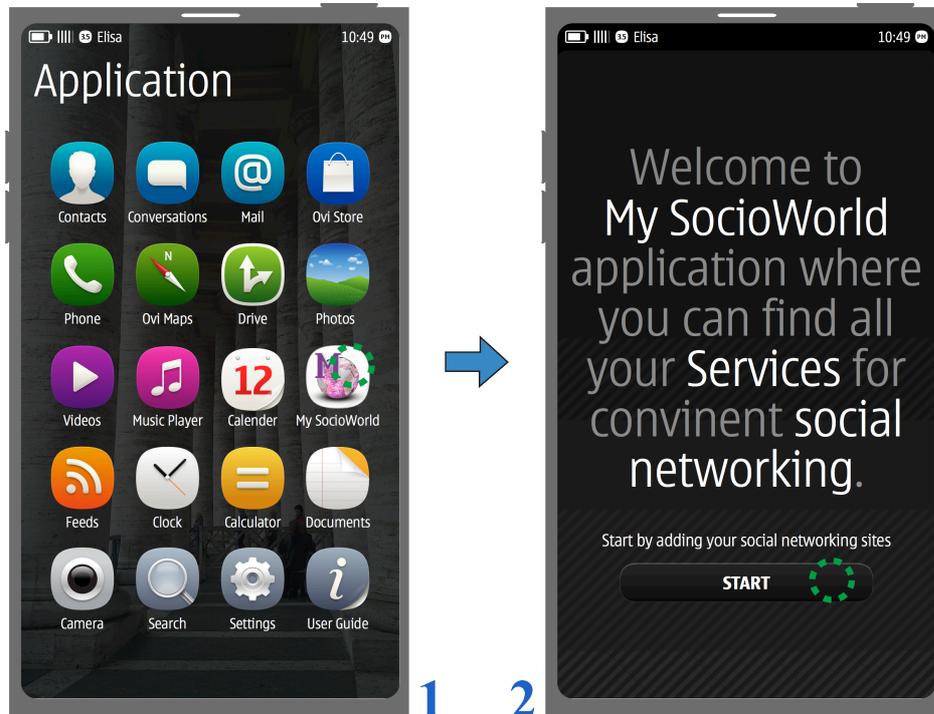
**Figure 19:** Flow chart diagram explaining interaction flow for use-case 1

The above flow chart in *figure 19* shows, a detailed interaction process and *figure 20* shows the overview of use-case 1 followed by detailed UI designs view obtained from mobile screen-shots as shown in *figure 21*.



**Figure 20:** Over view flow of UI design layouts from use-case 1

User interface design flow for use-case 1 – mobile screen shots

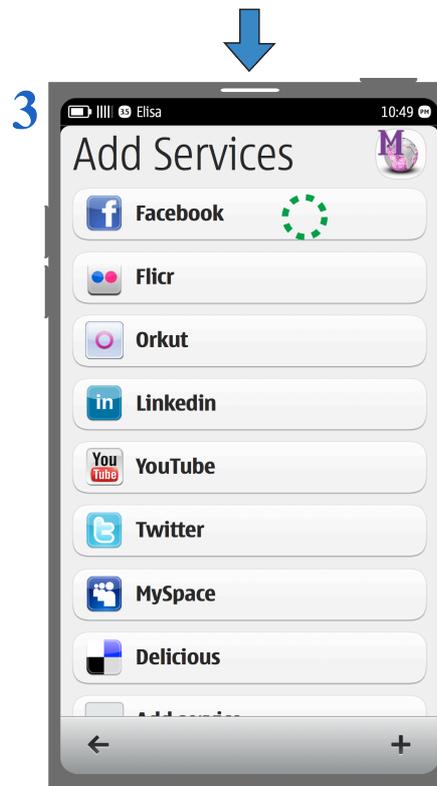


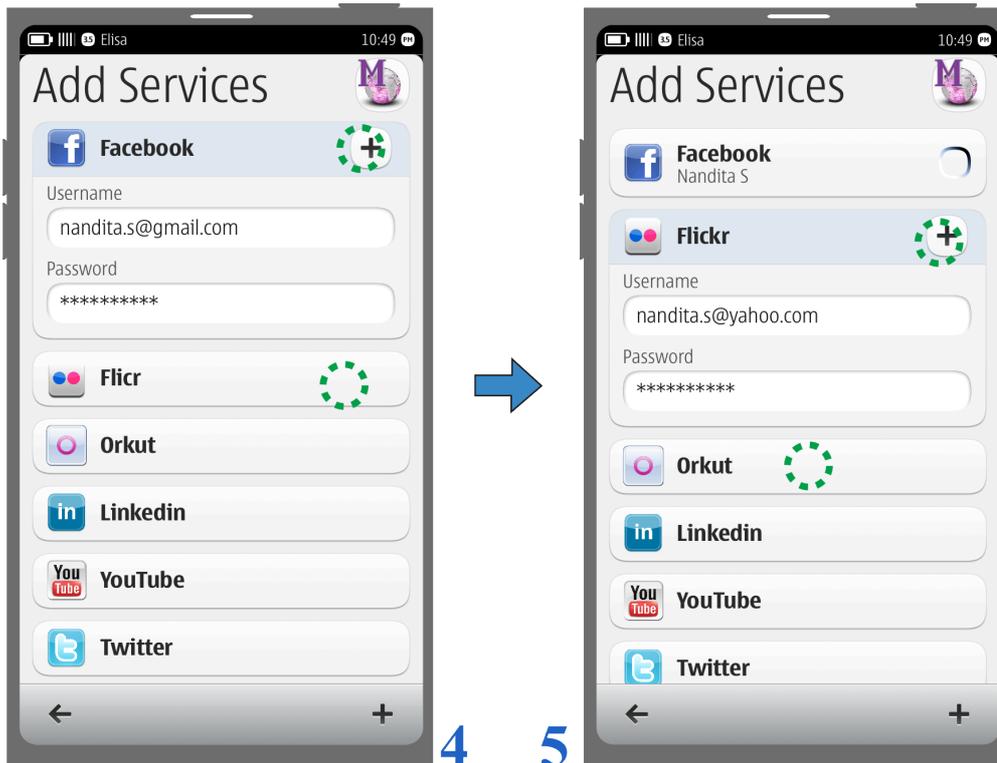
**Use-Case 1 – UI flow 1 of 3**

**UI 1:** Application grid view – showing My SocioWorld application; Tap My SocioWorld icon.

**UI 2:** Welcome view - giving short description introducing the application and stating applications functionality; Tap on Start button.

**UI 3:** Add Service view - where most of the commonly used SNS are listed; Tap on Facebook button.



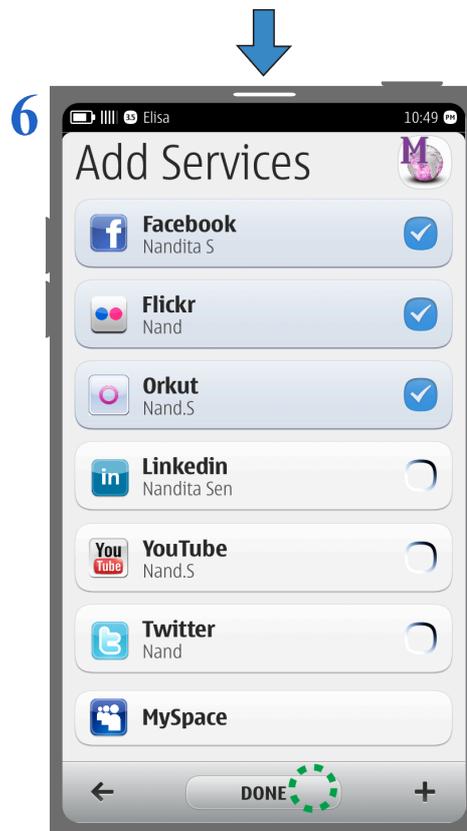


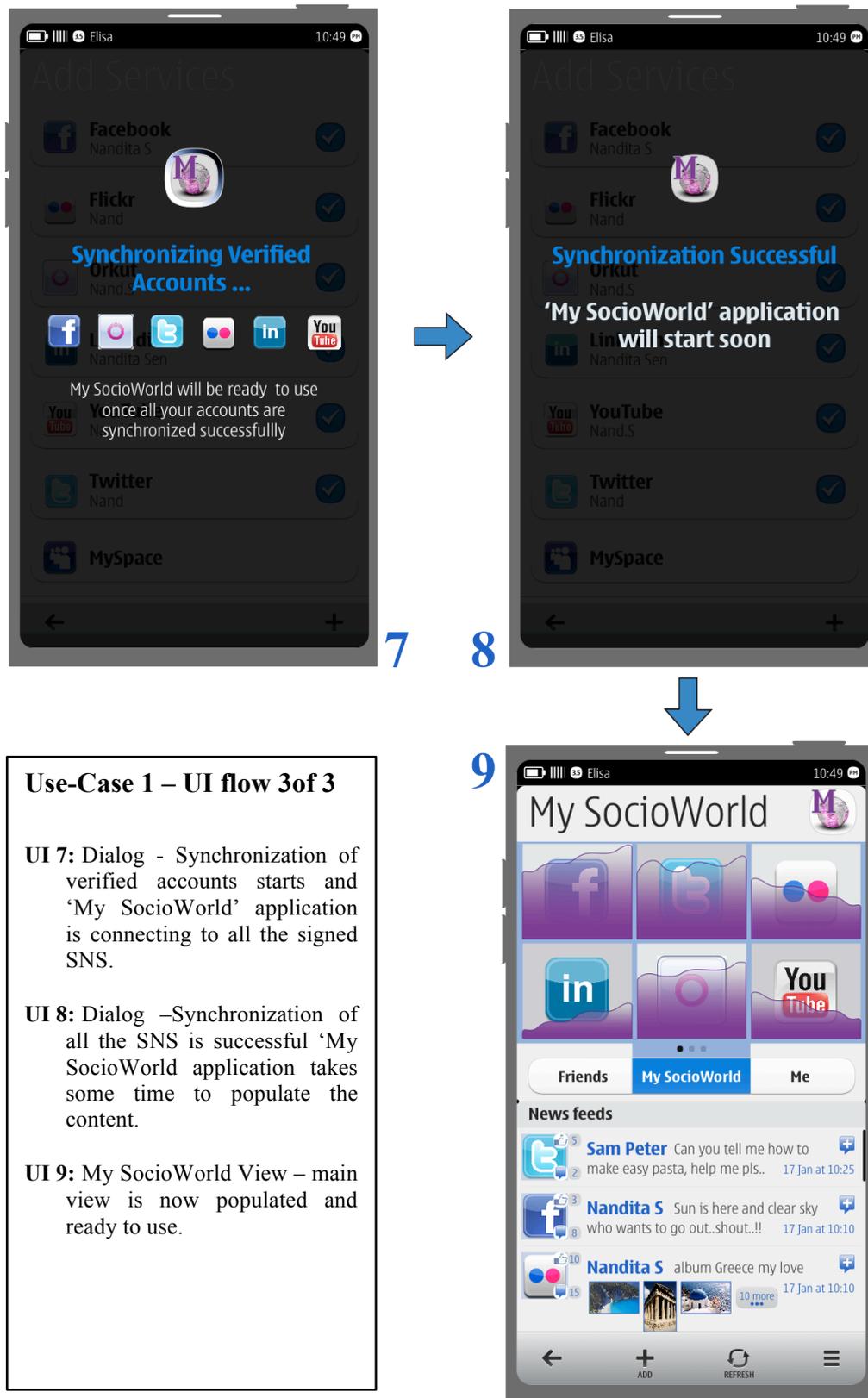
**Use-Case 1 – UI flow 2of 3**

**UI 4:** Facebook button drops open sign-in process for the service; type in username and password; tap on add icon

**UI 5:** Facebook password verification started. Tapping Flickr button drops open sign-in process; type in username and password; tap add icon.

**UI 6:** Password verification for all the signed SNS starts. Verified SNS marked correct; Tap Done button in toolbar.





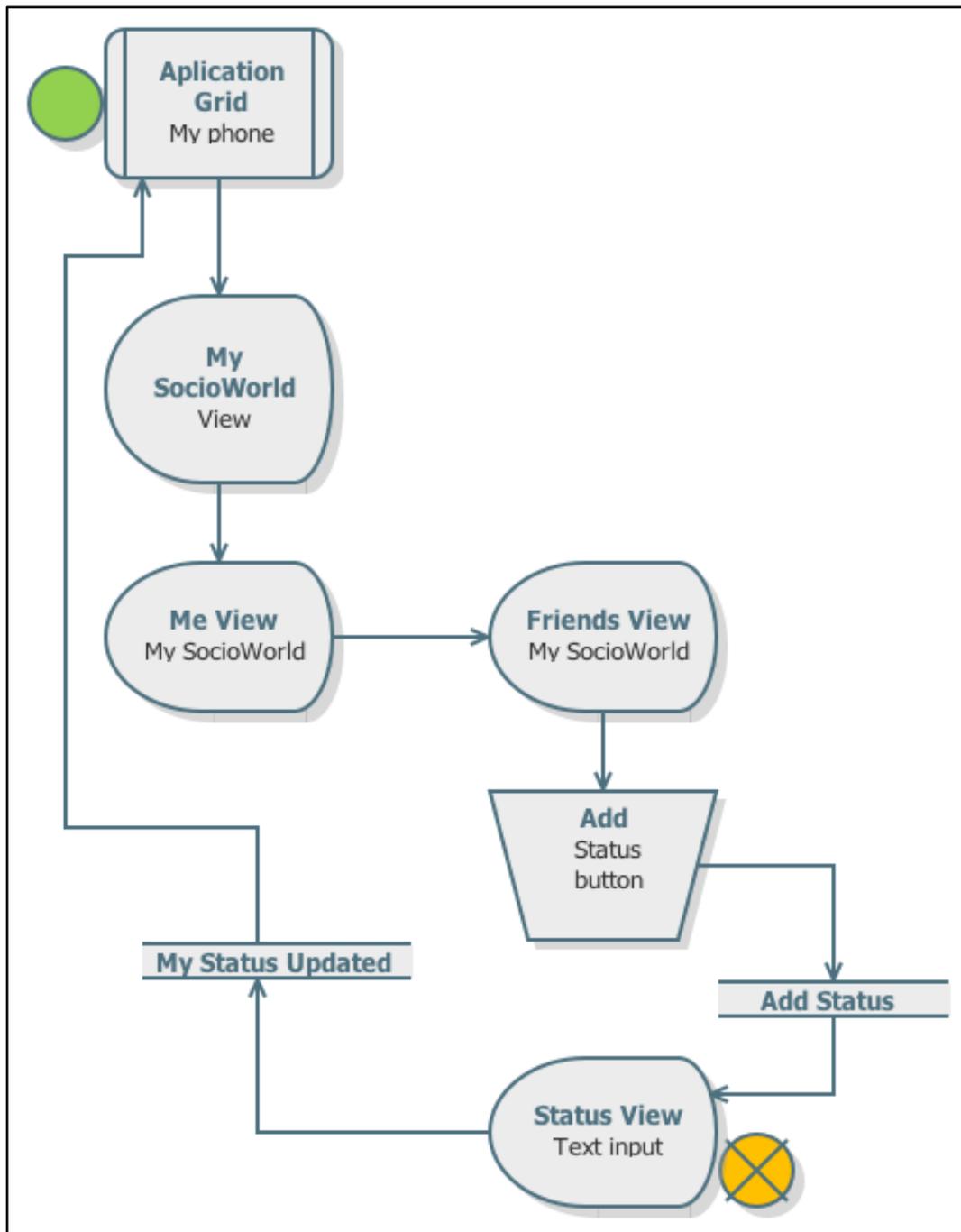
**Figure 21:** UI design flow mobile screen shots for use-case 1

#### **4.5.2 Use-Case 2: Check Updates and Add Status**

Nandita is now a proud owner of new latest technology smart mobile phone, which has 3G, internet connection; touch screen and fast mobile phone. She has also downloaded application called 'My SocioWorld' and added all her favourite SNS to the new application. Nandita is now on her way to work; she gets into the metro and finds herself a window seat. It usually takes some time by metro to reach work place; hence she has some time to herself. She takes out her smart mobile phone from her bag to check out her newly downloaded application 'My SocioWorld'. This application has well synchronized all the SNS that Nandita uses, to make it easy for her to check latest activities.

She opens the application from the application grid view of her phone. 'My SocioWorld' view shows her activities on different services; the representation is made fun and graphical and a list of latest updates is seen in the news feeds section. Nandita is now checking 'My SocioWorld' view and she immediately understands that the services those have more liquid filled in their container is the one has most activity happening. She now goes to updates at 'Me' tab, which shows her the latest updates on her own profile from various services. She now checks updates at 'Friends' tab where it shows her favourite friends activity. She understands easily more active the friend more shaded is friends profile picture.

After going through all the updates Nandita decides to add new status to all her services. Nandita finds the 'Add' button on the toolbar, tapping on it opens up options to add different type of content on 'My SocioWorld', which are - status, photos, links, message, event, location, birthday, etc. Nandita selects 'Status' button and the status view opens up in a separate view. The view displays text box to enter the status message that allows 140 characters. Also as shown buttons showing different services on which she can update her status at the same time. Nandita composes the status message and selects to update her Twitter and Facebook status. Once the status is updated 'My SocioWorld' application shows the updated status on the news feed section. Nandita finds it quick and easy to update her status to different SNS at the same time.



**Figure 22:** Flow chart diagram explaining interaction flow for use-case 2

The above flow chart in *figure 22* shows, a detailed interaction process and *figure 23* shows the overview of use-case 2 followed by detailed UI designs view obtained from mobile screen-shots as shown in *figure 24*.

'My SocioWorld' – An optimized application for MSN

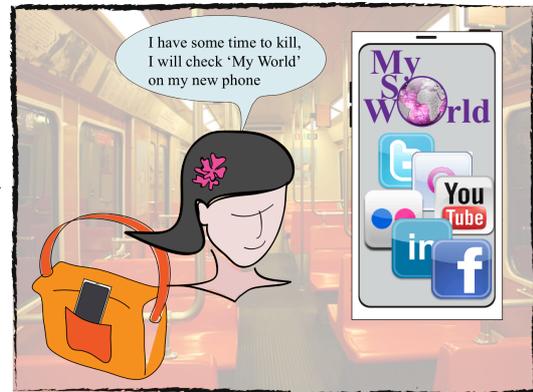


**Figure 23:** Over view flow showing UI design layouts for use-case 2

User interface design flow for use-case 2 – Mobile screen shots



Sketch 1



Sketch 2



**Use-Case 2 – UI flow 1 of 3**

**Sketch 1:** Nandita is at home feeling proud of her new smart mobile phone that has applications for all different SNS.

**Sketch 2:** Nandita is in metro travelling to work and has some time to her. She checks out new application 'My SocioWorld'

**UI 1:** Application grid – 'My SocioWorld' application; Tap on the icon

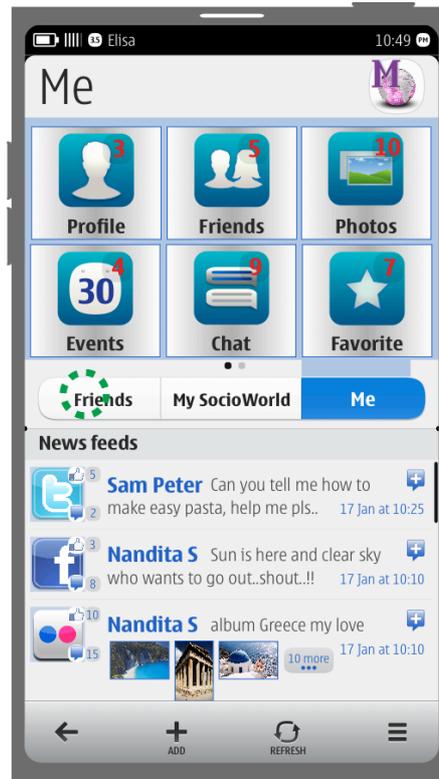




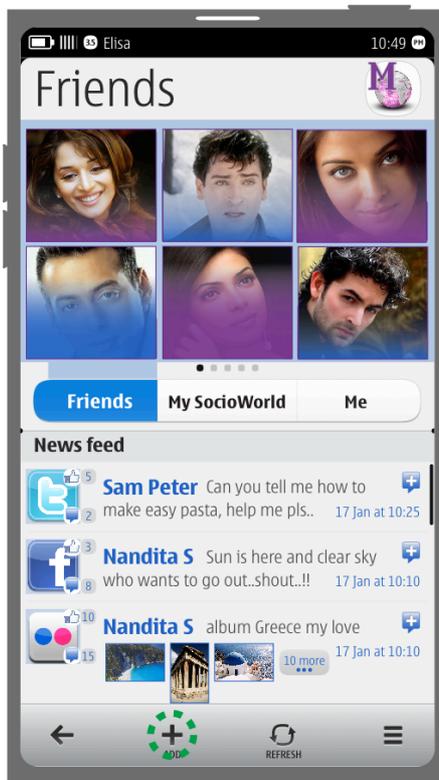
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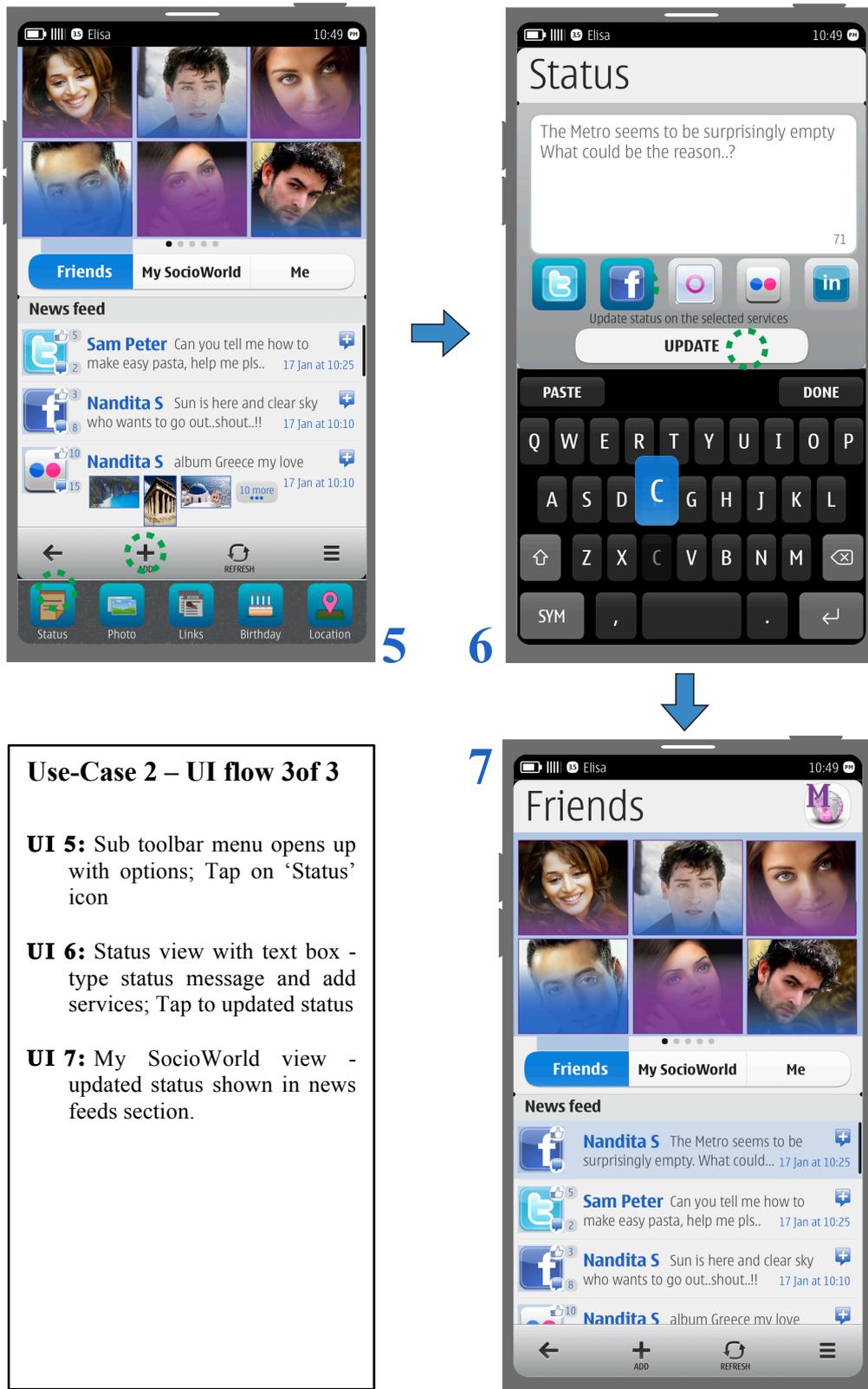


### Use-Case 2 – UI flow 2of 3

**UI 2:** 'My SocioWorld' view - latest updates from different services and news feed; Tap on 'Me' tab

**UI 3:** Me view on 'My SocioWorld' - latest updates at my profile from different services; Tap on 'Friends' tab.

**UI 4:** Friends view on 'My SocioWorld' - my active friends; Tap on 'Add' icon on status bar.



**Figure 24:** UI design flow mobile screen shots for use-case 2

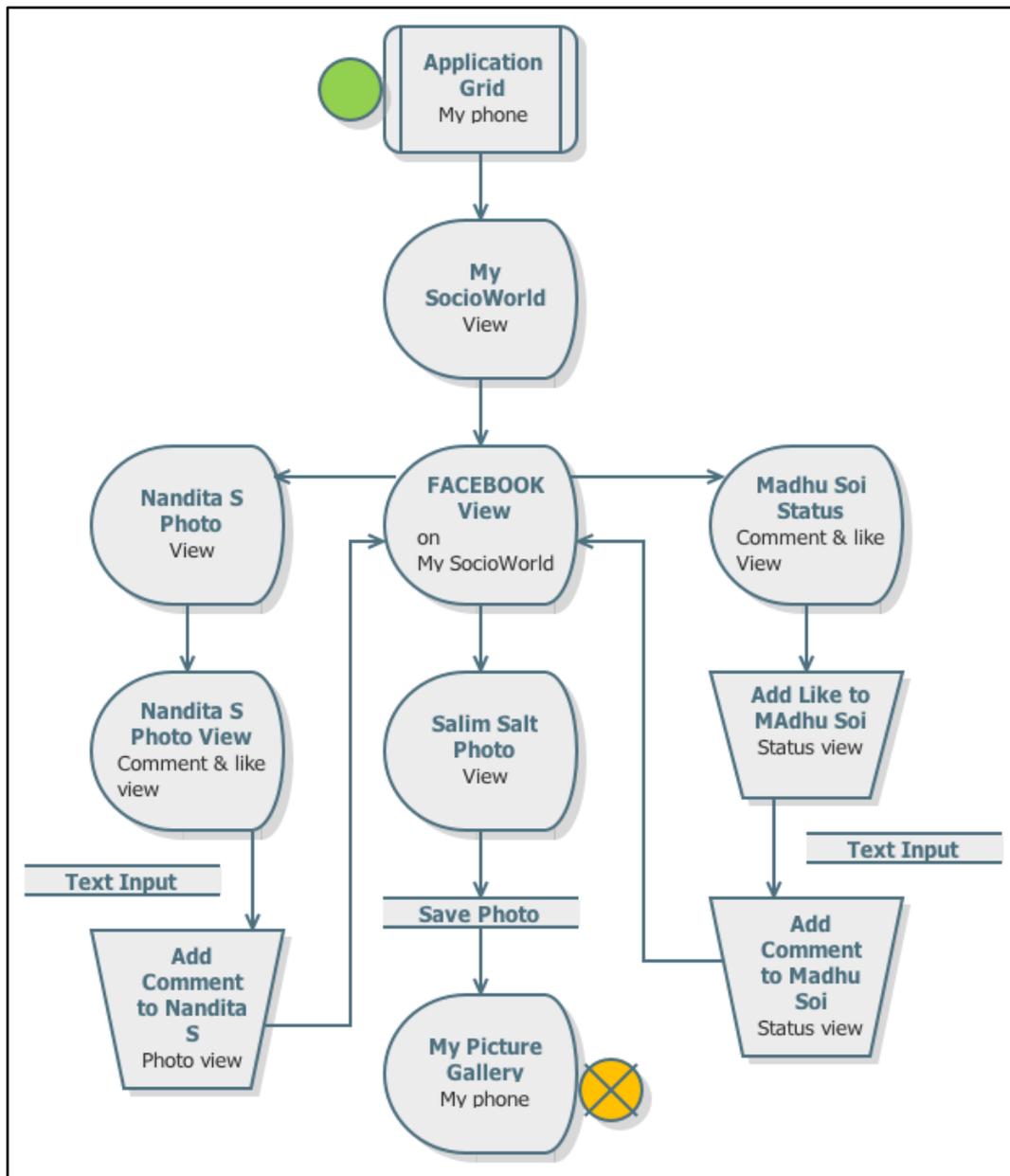
### **4.5.3 Use-Case 3: Comment Activities**

Nandita goes to 'My SocioWorld' application from phone's application grid to check new updates from her services. Graphical representation of activities on the different services fascinates Nandita. She soon realizes that the liquid in the Facebook container is more filled than others; she understands that there are more activities happening on Facebook. Anxiously she enters into the Facebook view from 'My SocioWorld'. Here Nandita can see all her favourite friends activity listed on time line, the latest update is on the top of the list.

She notices Madhu has a very interesting status and many have liked her status this catches Nandita's attention and she acts on the comment. Taping on the 'Comments' gives her quick access to comment and/or like the status, and opens 'Comment view'. In the 'Comment view' Nandita reads others' comments and decides to comment on Madhu's status. She composes her comment and sends it and she also like the status. Nandita now goes back to Facebook view on 'My SocioWorld' to check more updates from other friends.

She notices that her uploaded photos has received a few comments she, goes to her photos entry. The 'Photo view' opens up on full screen showing detail of the photo, options to share, make favourite, save to my phone and number of comments received on the photo. Nandita goes to the comments and the view opens in comment view. She goes over the comments given by her friends. She responds to their comments and goes back to Facebook view on 'My SocioWorld'.

Nandita scrolls down in the list to see more activities, here she finds Sami photos from his last holiday tour to beautiful Rome. Eagerly she opens one of the thumbnails that interest her; the image opens up in full screen for better visibility. Nandita likes the photo, makes it favourite photo and decides to save the photo to her phone. The options on the 'Photo view' give her an easy access to save the photo to her phone's picture gallery. Once the photo is downloaded Nandita receives the notification that the photo is saved to her phone. From the notification she navigates to check her 'My picture gallery' where the downloaded photo is saved and quickly she makes it her phones Wallpaper photo.



**Figure 25:** Flow chart diagram explaining interaction flow for use-case 3

The above flow chart in *figure 25* shows, a detailed interaction process and *figure 26* shows the overview of use-case 3 followed by detailed UI designs view obtained from mobile screen-shots as shown in *figure 27*.

'My SocioWorld' – An optimized application for MSN

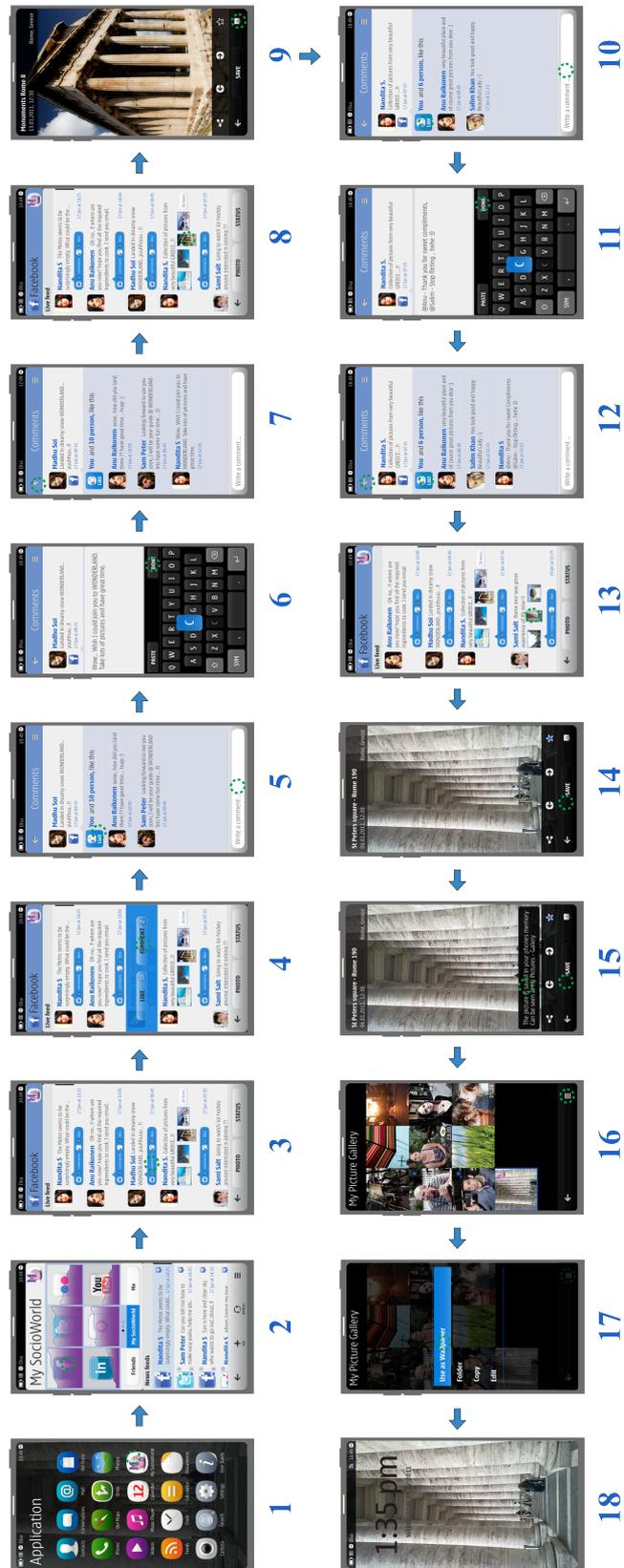


Figure 26: Over view flow showing UI design layouts for use-case 3

User interface design flow for use-case 3 – Mobile screen shots



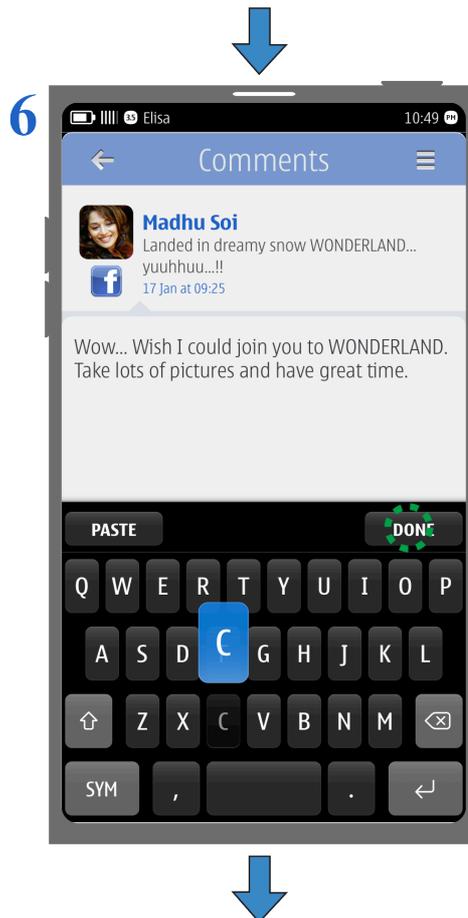


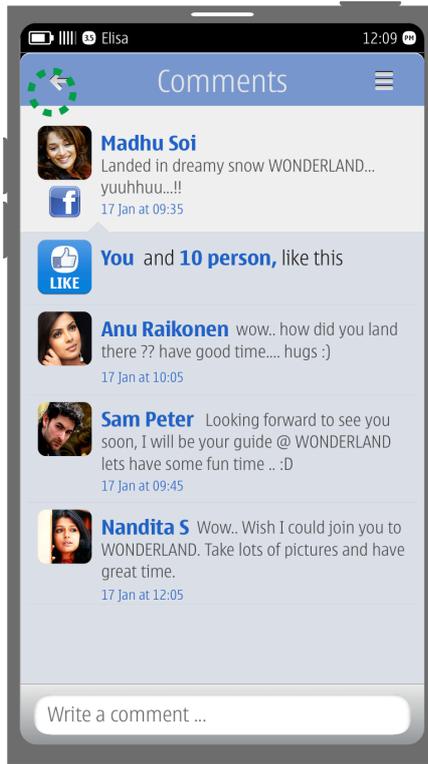
**Use-Case 3 – UI flow 2 of 6**

**UI 4:** Facebook view - Quick link to like and comment over the selected item; Tap on comment button.

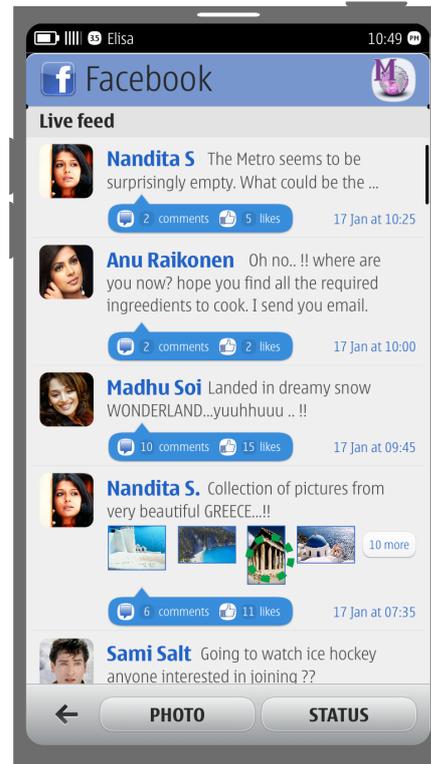
**UI 5:** Comment view - showing Madhu Soi complete status and comments from other friends; Tap on like button and tap write comment text box.

**UI 6:** Comment view - with keyboard and text entry box to compose comment; Tap done button.





7



8

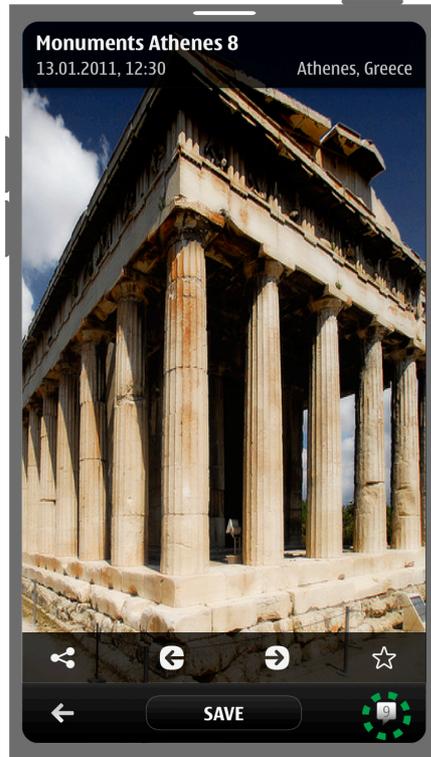
**Use-Case 3 – UI flow 3 of 6**

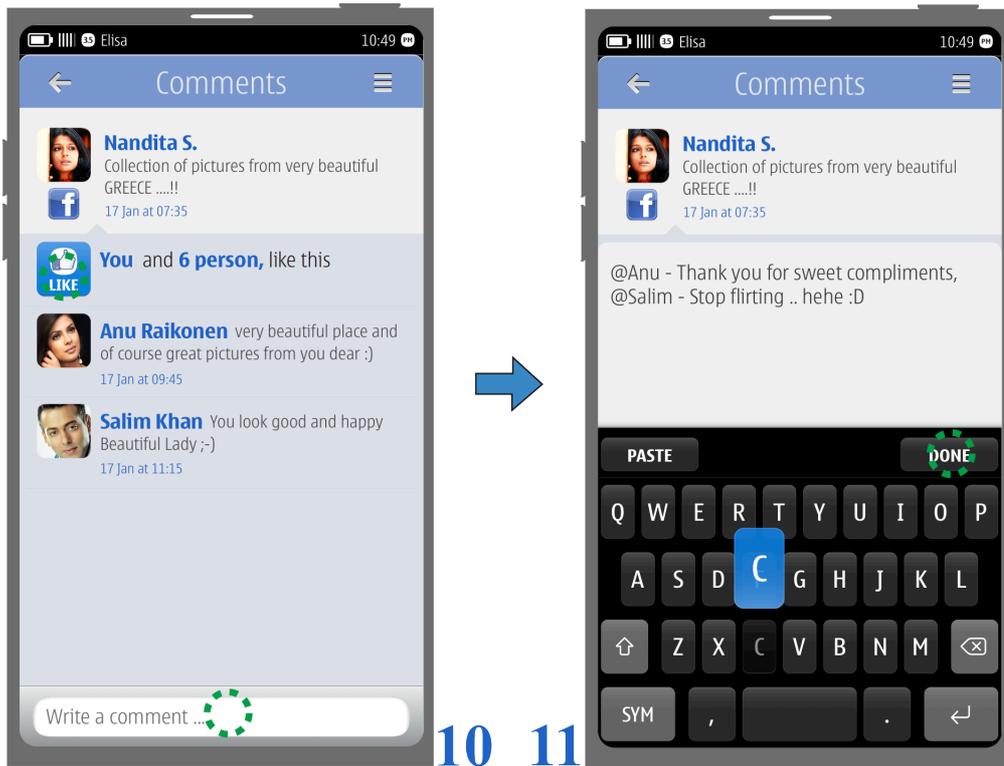
**UI 7:** Comment view of Madhu Soi - showing Nandita's updated comment; Tap on back button.

**UI 8:** Facebook view on My SocioWorld; Tap photo thumbnail of Nandita's entry

**UI 9:** Full screen - Photo view which shows details of photo on top and actions on bottom; Tap comment icon button.

9



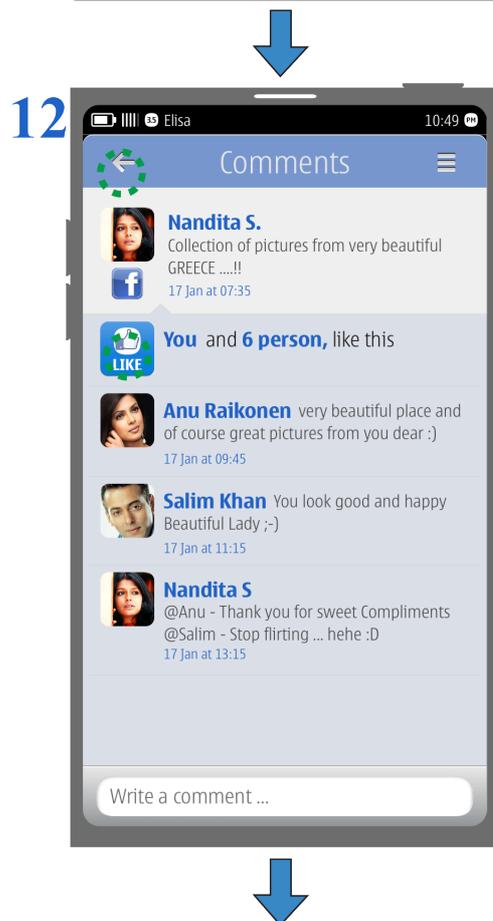


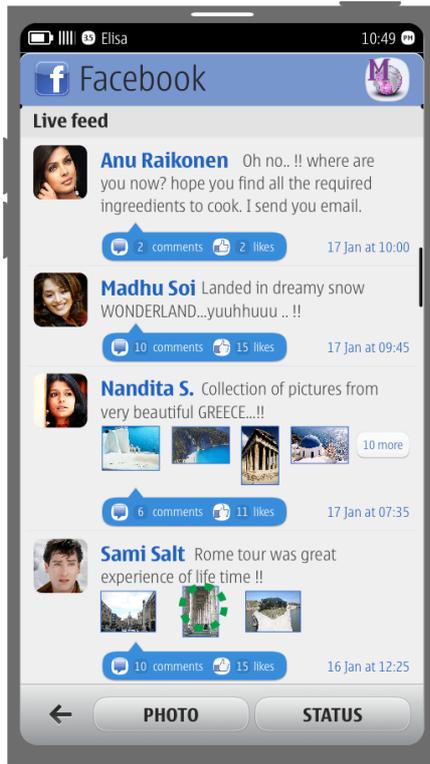
**Use-Case 3 – UI flow 4 of 6**

**UI 10:** Comment view of Nandita S. – showing list of likes and comments by friends; Tap on write comment.

**UI 11:** Compose view with text box and keyboard. Composing comment text; Tap on Done button.

**UI 12:** Comment view of Nandita S - showing updated comment; Tap back button.





13 14



**Use-Case 3 – UI flow 5 of 6**

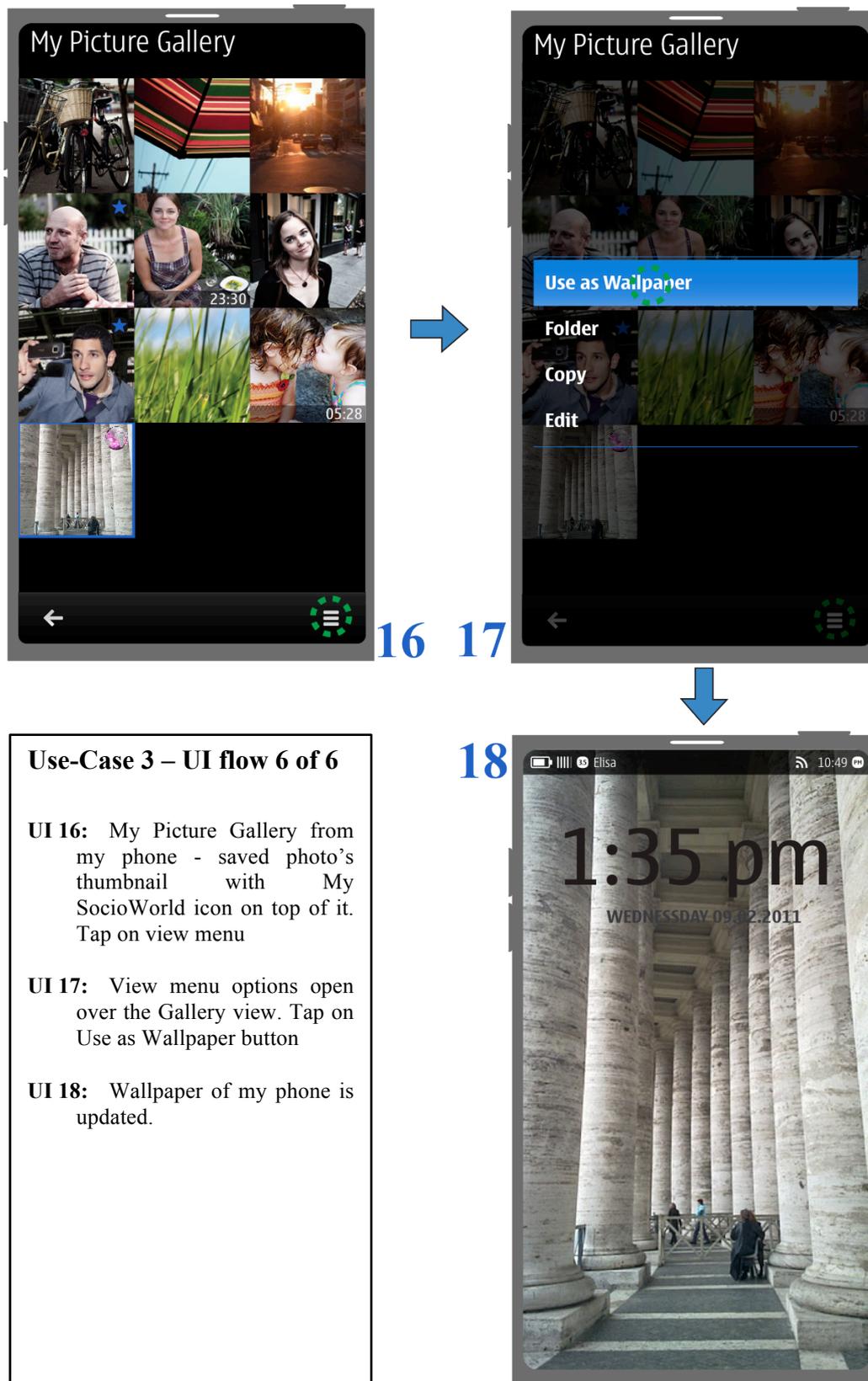
**UI 13:** Facebook view on My SocioWorld - scrolling down in the list; Tap on Sami Salt photo entry's thumbnail.

**UI 14:** Full screen photo view - detail of photo and action buttons; Tap on favourite icon later tap on save button on toolbar.

**UI 15:** Notification - saving process is completed; Tap on the Notification

15





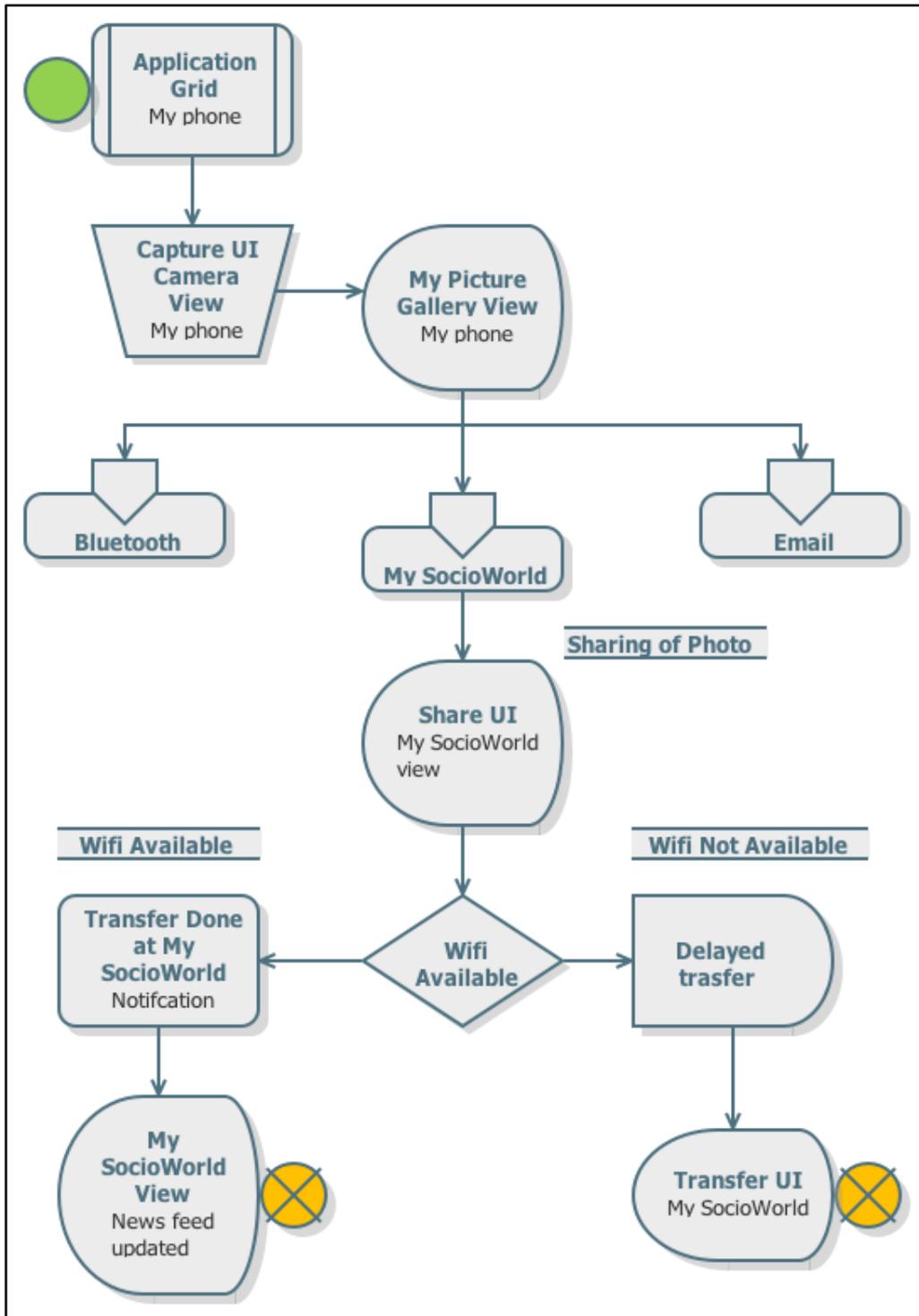
**Figure 27:** UI design flow mobile screen shots for use-case 3

#### 4.5.4 Use-Case 4: Share and Transfer Image

Nandita has already planned to meet her good friend Anna after work to go together for shopping. The day at work ends and she is waiting outside her office for Anna to come. Meanwhile she is surfing over 'My SocioWorld' checking her updates. Anna reaches and both of them start going towards the shopping centre. While shopping Nandita stops and notices a very interesting window display of a shop. She stops to admire the window display and thinks it's a good inspiration for the project she is working on. She takes picture and plans to share the photo with her work colleague to share her thoughts with him.

Nandita shares the photo from her phone's photo gallery. Here the sharing option gives her three different options share via email, 'My SocioWorld' or Bluetooth. Nandita decide to share the photo through a broader option hence she uploads the photo at 'My SocioWorld'. The 'Share view' opens on 'My SocioWorld' showing the photo she is sharing, option to upload on different services and methods to upload the photo. Nandita selects Flickr service as most of her work colleagues can see and Facebook to receive comments from other friends as it is now possible to upload the photos in more than one service at the same time. Next section gives option to select method of sharing, default selection here is Wi-Fi, as 'My SocioWorld' application does not want its user to spend more money using 3G networks. Nandita is very conscious about her phone bills so she selects Wi-Fi mode of uploading. As the Wi-Fi is not currently available uploading has not started and that can be checked from the transfer view.

After shopping Nandita goes to have coffee in a café nearby. The café has free Wi-Fi available for their customers; this makes Nandita think that she can use the Wi-Fi service to surf. Mean while she receives notification on her mobile saying that Wi-Fi is discovered and uploading has started, this makes Nandita very happy and she thinks that 'My SocioWorld' is very smart application. She opens 'My SocioWorld' and notices that her photo has already been uploaded and is listed in her news feeds section.



**Figure 28:** Flow chart diagram explaining interaction flow for use-case 4

The above flow chart in *figure 28* shows, a detailed interaction process and *figure 29* shows the overview of use-case 4 followed by detailed UI designs view obtained from mobile screen-shots as shown in *figure 30*.



**Figure 29:** Over view flow showing UI design layouts for use-case 4

User interface design flow for use-case 4 – Sketches and mobile screen shots



Sketch 1



Sketch 2



**Use-Case 4 – UI flow 1 of 4**

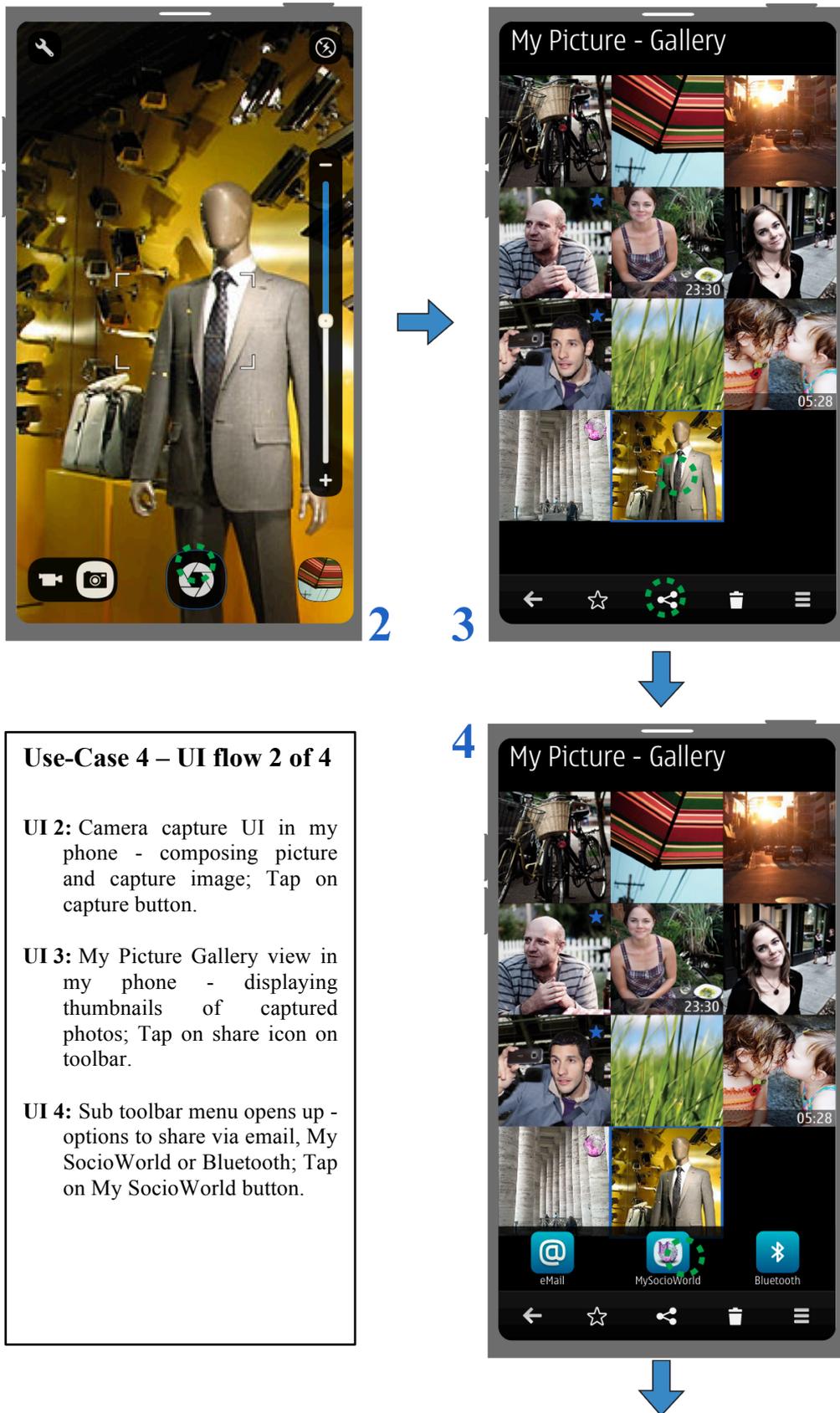
**Sketch 1:** Nandita meets her friend Anna after work. While waiting for her friend Nandita checks her My SocioWorld

**Sketch 2:** While shopping Nandita notices a very interesting window display in a shop, she decides to take picture and share it with My SocioWorld

**UI 1:** Application grid view Tap on camera icon.

1



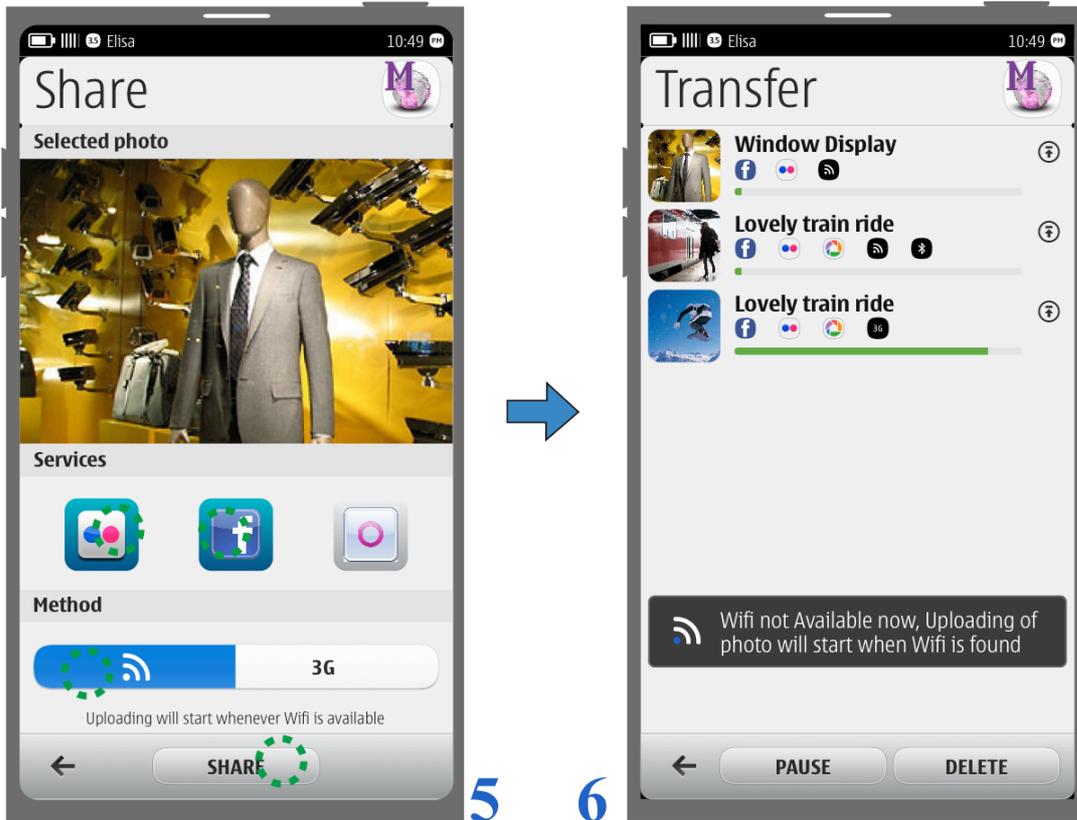


**Use-Case 4 – UI flow 2 of 4**

**UI 2:** Camera capture UI in my phone - composing picture and capture image; Tap on capture button.

**UI 3:** My Picture Gallery view in my phone - displaying thumbnails of captured photos; Tap on share icon on toolbar.

**UI 4:** Sub toolbar menu opens up - options to share via email, My SocioWorld or Bluetooth; Tap on My SocioWorld button.



**Use-Case 4 – UI flow 3 of 4**

**UI 5:** Share view on My SocioWorld - Showing photo, Services and method to upload photo; Tap on Flickr and Facebook buttons, tap on wifi icon and tap on toolbar share button.

**UI 6:** Showing transfers in queue, Notification showing wifi is not available hence transfer has not started.

**Sketch 3:** Nandita enters café where free wifi is available



**Sketch 3**



**Use-Case 4 – UI flow 4 of 4**

**UI 7:** Home screen notification from my world - stating Wifi is now available and uploading has started; Tap on notification.

**UI 8:** My SocioWorld view - showing uploaded photo in News feed section.

**Figure 30:** UI design flow mobile screen shots for use-case 4

#### **4.5.5 Use-Case 5: Create Event**

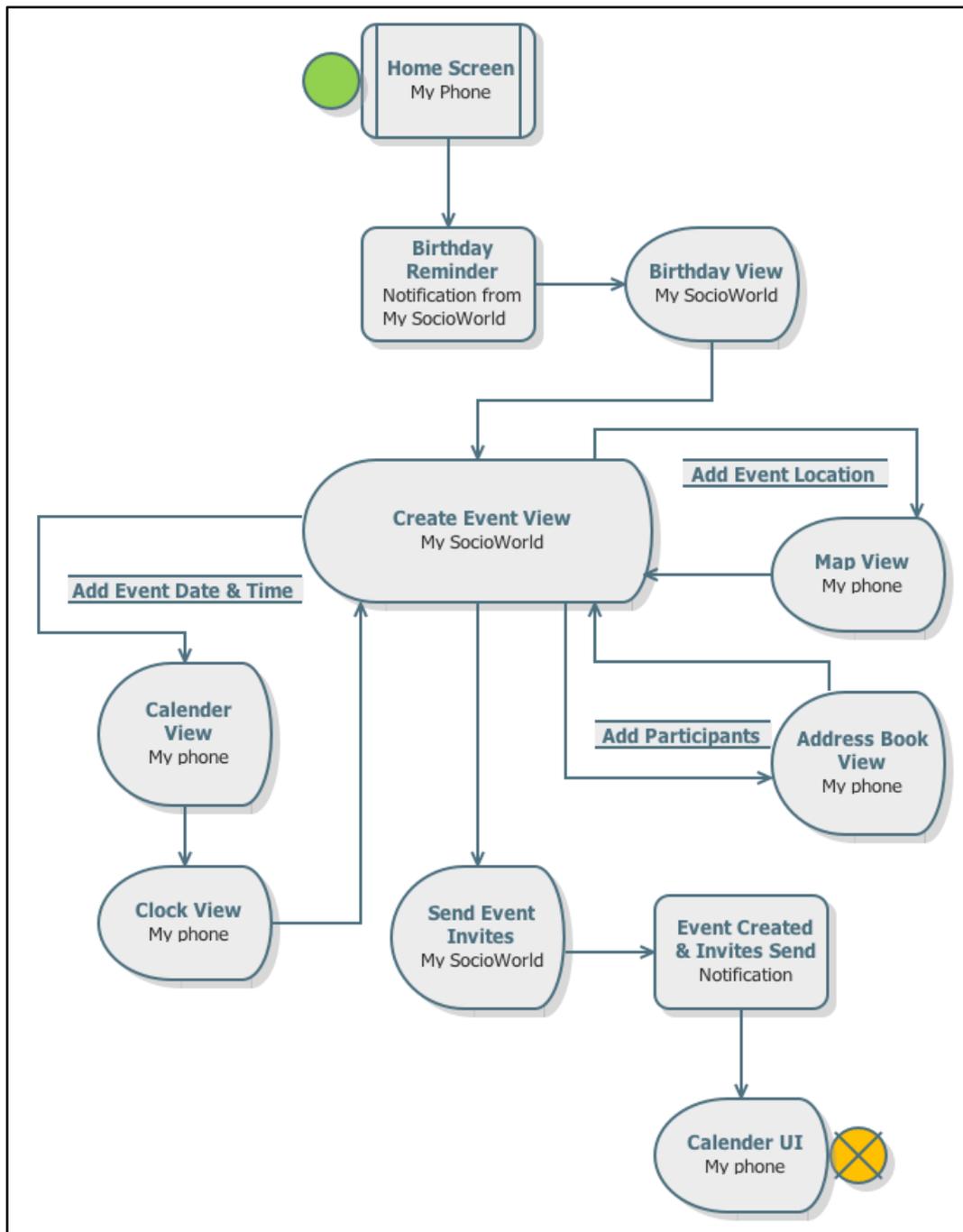
Nandita is still in the café enjoying her coffee after exhausting shopping endeavour. She receives notification from 'My SocioWorld' application on her phone - birthday reminder. She opens the phone and notices it's her good friend Madhu's birthday tomorrow. She gets excited and decides to plan a surprise party for her.

Nandita goes to birthday view from the reminder notification and notices that there is create event button already available for her convenience. She goes to 'Create event' view and thinks that this looks very easy to use.

She starts creating event by adding title – Surprise party for Madhu Soi. Adds date and time for the event navigates to use her phone's calendar and clock UI view. Nandita notices that her phones applications are very well integrated with 'My SocioWorld' application. She decides to make the event private so not everyone gets to see the invitation. She then adds location to the event, which is supposed to be Madhu's home to surprise her when she comes back from work. After adding practical information Nandita starts adding friends to be invited for the party; here she can do multi selection and add few friends on the event. After adding description to the event she decides to send the invite to all participants.

Once all the invites are sent she gets notification that the event is created and invites are sent. She than goes to her phone's calendar view UI and notices that 'My SocioWorld' has already added the event on her phone's calendar.

Nandita is happy to see the well-integrated application that uses her phone's application to enhance use of 'My SocioWorld' applications on her smart mobile phone.



**Figure 31:** Flow chart diagram explaining interaction flow for use-case 5

The above flow chart in *figure 31* shows, a detailed interaction process and *figure 32* shows the overview of use-case 5 followed by detailed UI designs view obtained from mobile screen-shots as shown in *figure 33*.

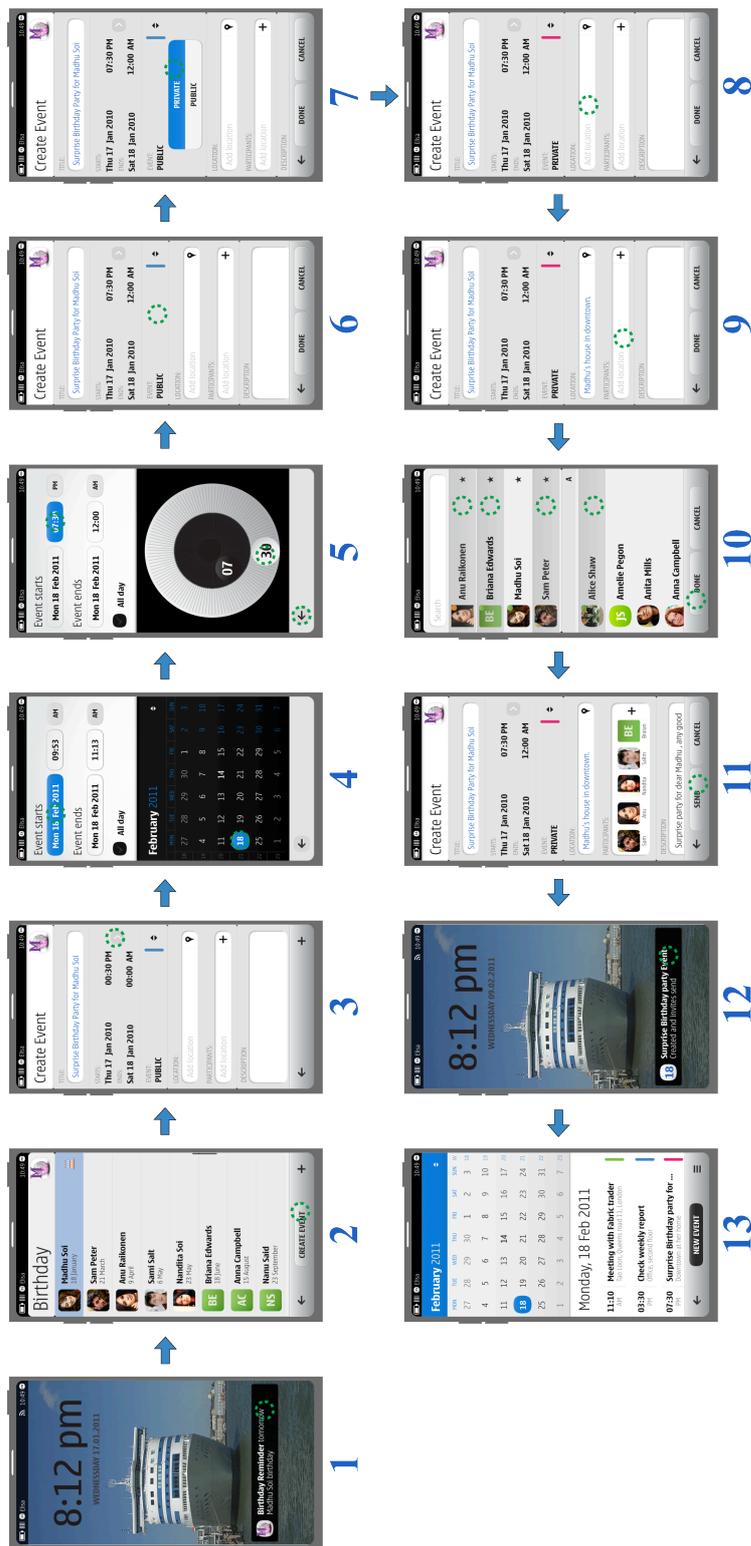
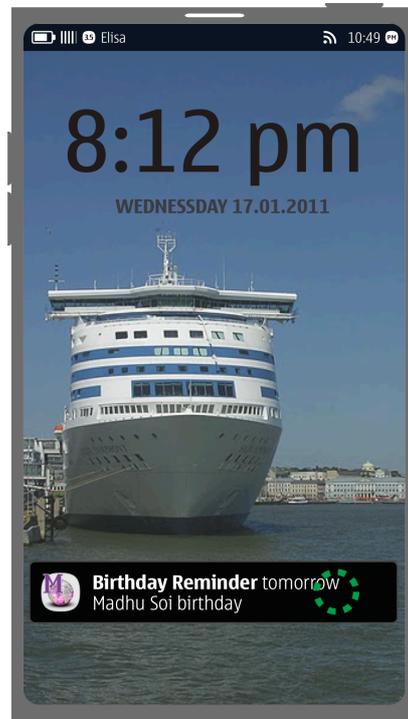


Figure 32: Over view flow showing UI design layouts for use-case 5

User interface design flow for use-case 5 – Sketch and mobile screen shots



Sketch 1



1



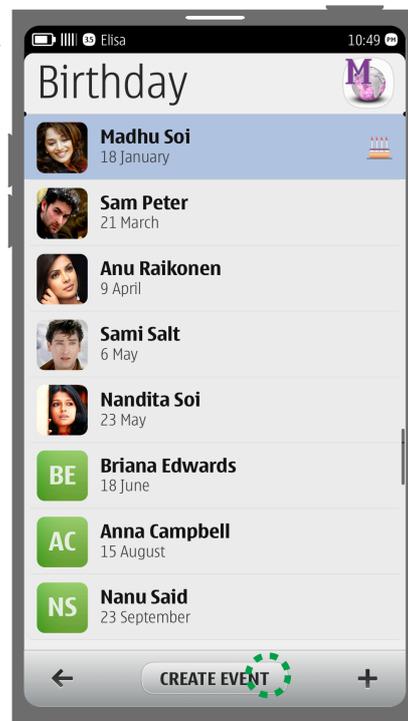
**Use-Case 5 – UI flow 1 of 5**

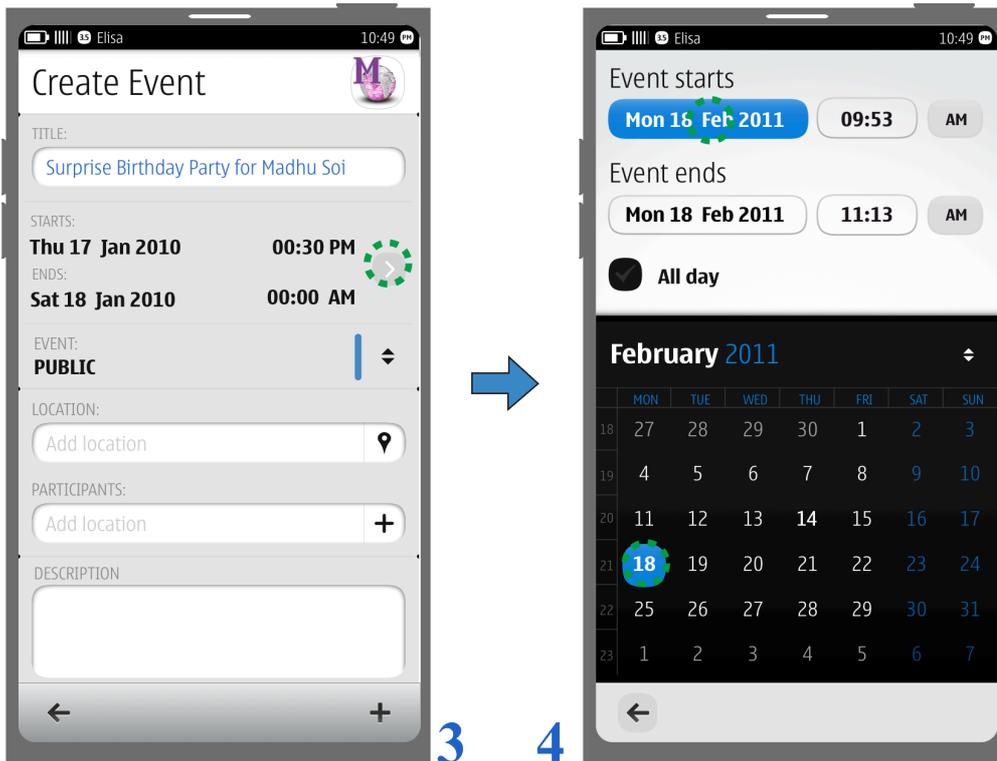
**Sketch 1:** Nandita is in Café enjoying her coffee after her shopping endeavour receives notification about birthday reminder.

**UI 1:** Home Screen – Notification from My SocioWorld about birthday reminder; Tap on the notification.

**UI 2:** Birthday view on My SocioWorld - Showing highlighted friend whose birthday is tomorrow; Tap on Create even button in toolbar.

2



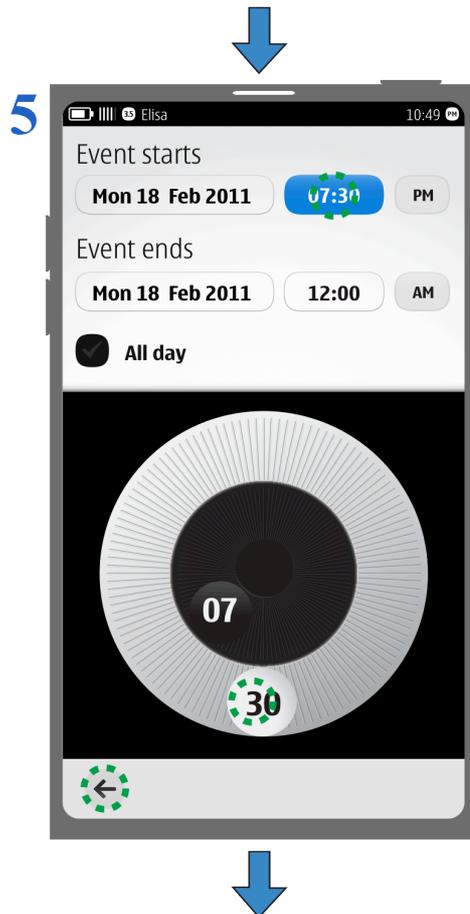


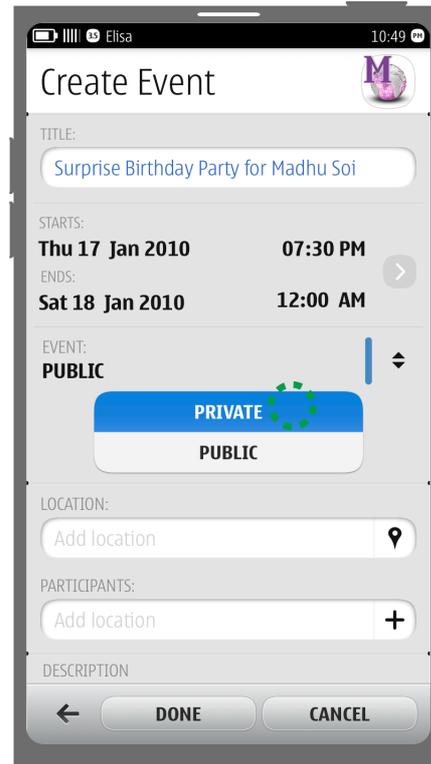
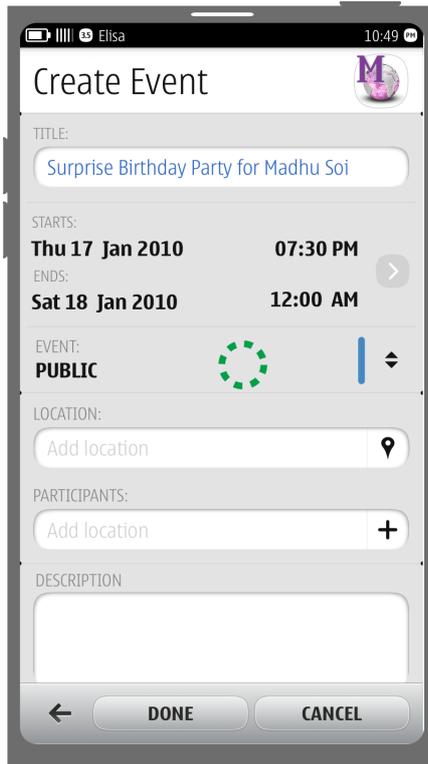
**Use-Case 5 – UI flow 2 of 5**

**UI 3:** Create event view on My SocioWorld - adding title of the event; tap on start-end time and date of event

**UI 4:** Calendar view on my phone - picking day for the event; Next view to set time

**UI 5:** Clock view on my phone - select start and end time for the event; Tap back





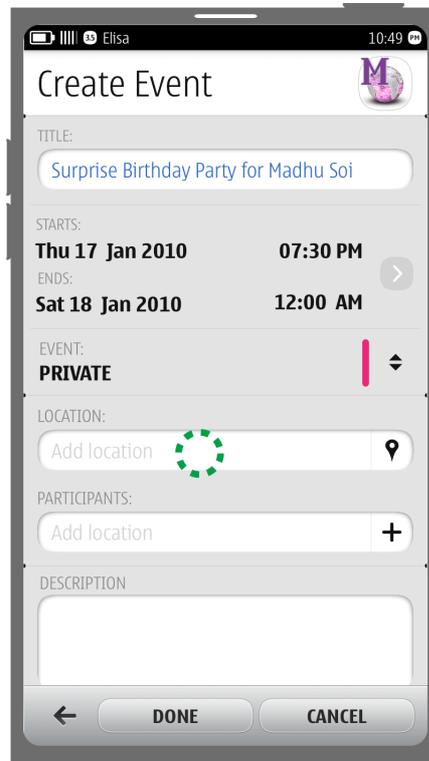
**Use-Case 5 – UI flow 3 of 5**

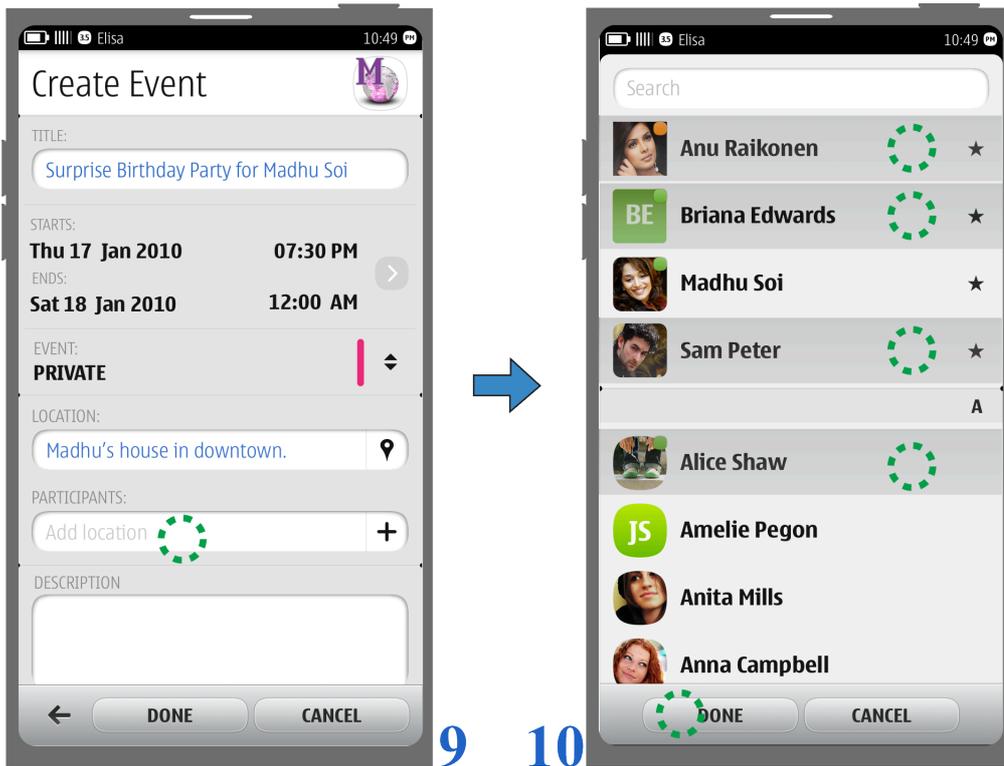
**UI 6:** Create event view on My SocioWorld - day and time set next setting type of event; Tap on event type

**UI 7:** Create event view- changing the event type to private; Tap on Private button

**UI 8:** Create event view - adding location; Tap on location text box

8



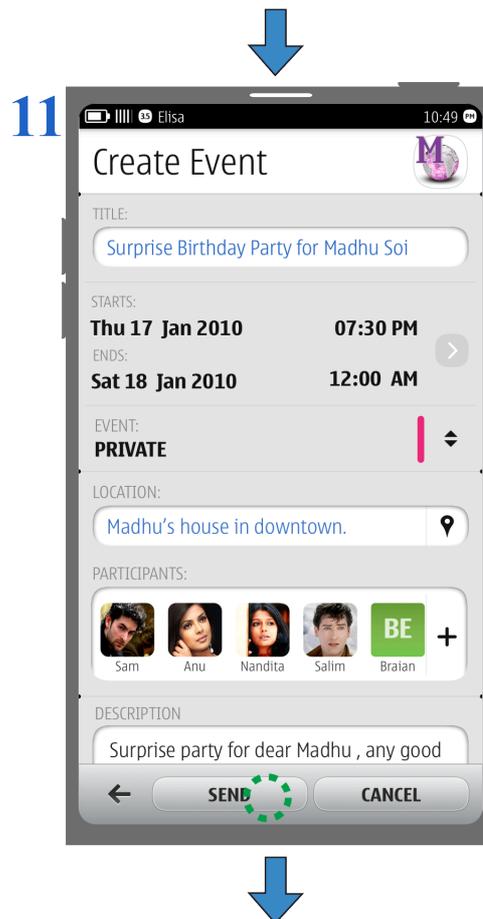


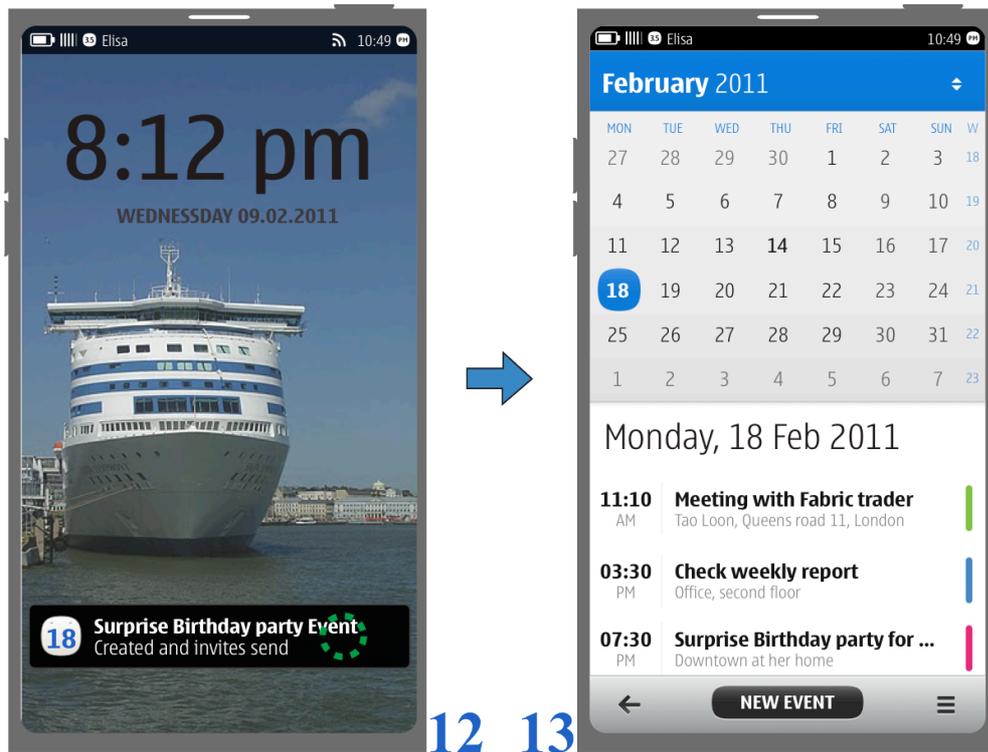
**Use-Case 5 – UI flow 4 of 5**

**UI 9:** Create event view - location updated next adding participants; Tap on add participants text box

**UI 10:** Friends list view - selecting friends to invite; Tap toolbar done button

**UI 11:** Create event view – friends added next adding description to complete event creation; Tap toolbar send button.





**Use-Case 5 – UI flow 4 of 5**

**UI 12:** Home Screen showing notification – event created and invites send; Tap on the notification

**UI 13:** Calendar UI in my phone - event day is saved listed in her calendar.

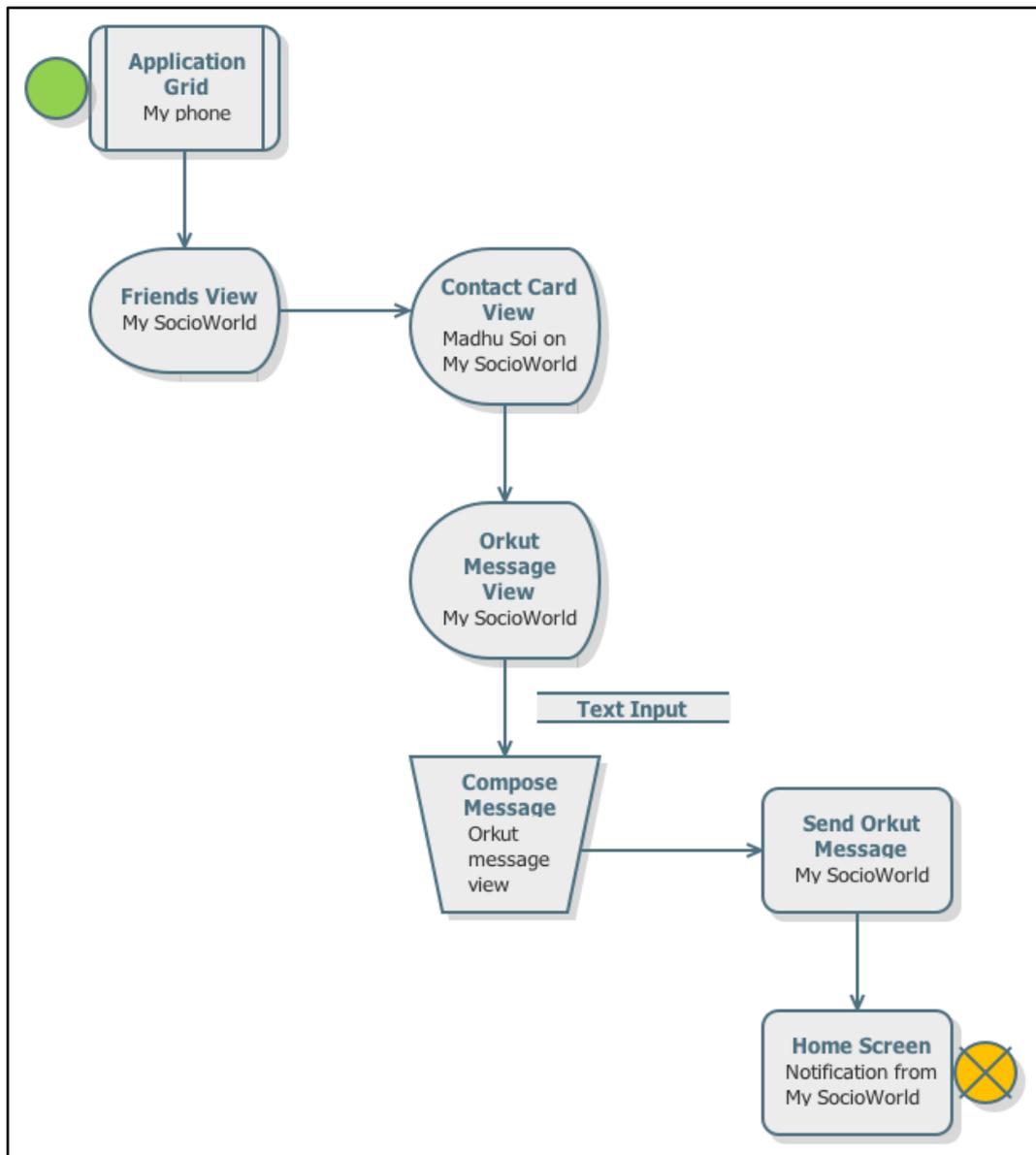
**Figure 33:** UI design flow mobile screen shots for use-case 5

#### **4.5.6 Use-Case 6: Holistic Contact Card View**

After sending out the invites Nandita leaves from café to go meet other friend for dinner. She notices that Madhu did not come for the dinner. While waiting for other friends she checks out 'My SocioWorld' application. Nandita goes to friends view on 'My SocioWorld' and finds Madhu's picture button is less shaded, she speculates - seems like there is very less activity from her either she is travelling or she is too busy. So she goes to see Madhu's contact card that contained all the information like - profession, location, birth date, mobile number, email address, Skype address and all the services in which she is involved. Nandita again notices that 'My SocioWorld' has integrated phone's address book collected all the email address and phone number from there. Nandita is smiling and likes the smartness of 'My SocioWorld' and shows it to her other friends and tells them to also use 'My SocioWorld' application.

Nandita notices the services in which Madhu is involved also the contact card displays all the activities from those services. Nandita likes this kind of smart contact card that contains all the information she expects to see from one person. She notices that under services there are different tabs for status, photo, links and friends. Nandita goes to status tab and notices that all status from different services is listed together with options for relevant actions. Nandita remembers that Madhu is very active on Orkut so she decides to send her a message on Orkut. She composes message to Madhu and sends it out.

Once all of invited friends have arrived and they all go to their table, while Nandita settles herself on the table she receives notification from 'My SocioWorld' application. The Notification says that the message is successfully send to Madhu. She goes to 'My SocioWorld' to see if there is any new update for her and notices that the event she had sent earlier has some new messages. She decides to check the updates later and gets back to enjoy dinner with her real life friends.



**Figure 34:** Flow chart diagram explaining interaction flow for use-case 6

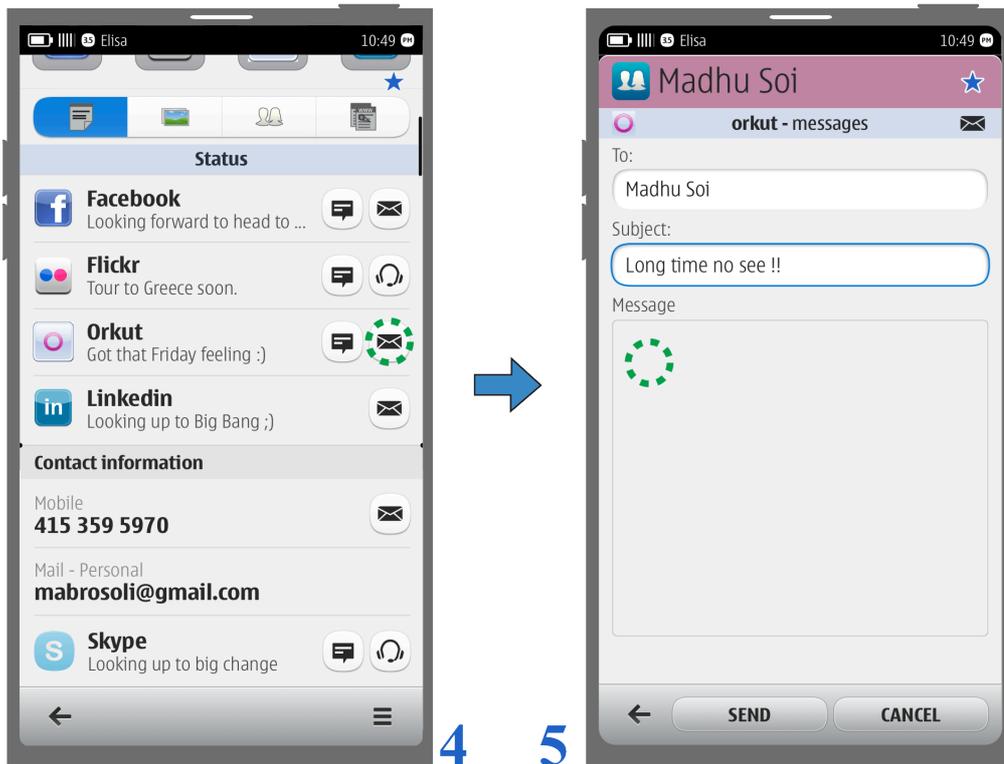
The above flow chart in *figure 34* shows, a detailed interaction process and *figure 35* shows the overview of use-case 6 followed by detailed UI designs view obtained from mobile screen-shots as shown in *figure 36*.



**Figure 35:** Over view flow showing UI design layouts for use-case 6

User interface design flow for use-case 6 – Sketch and mobile screen shots



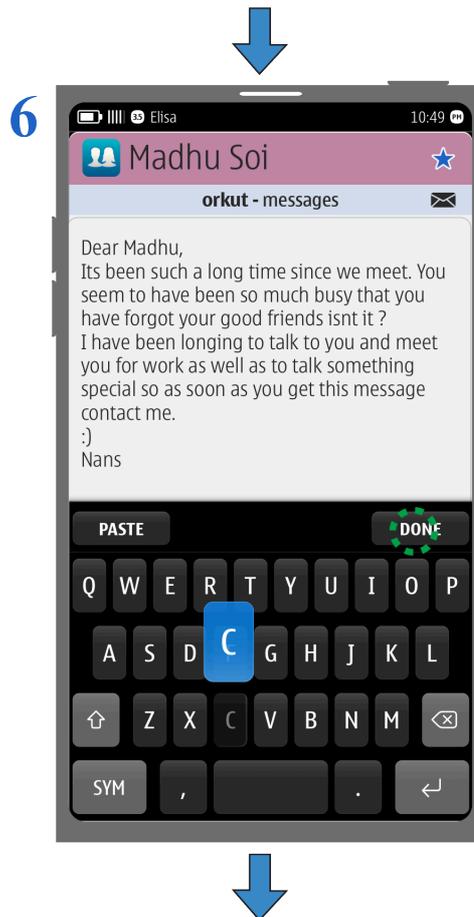


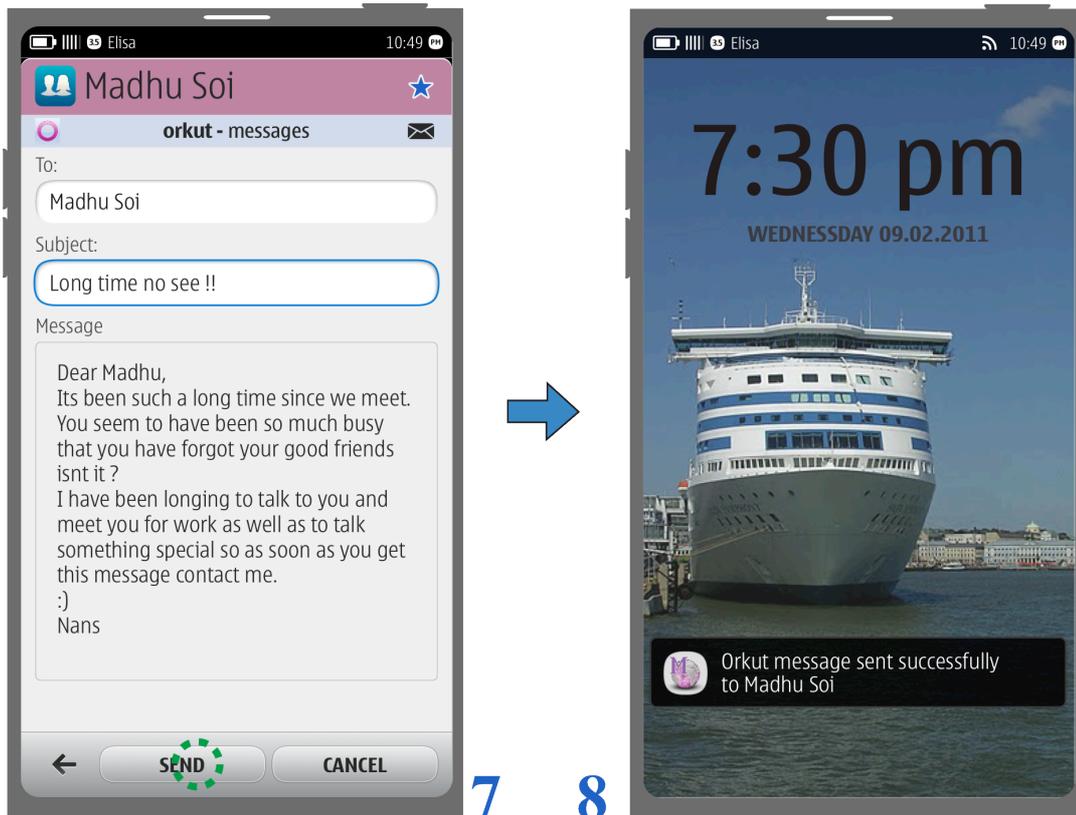
**Use-Case 6 – UI flow 2 of 3**

**UI 4:** Madhu Soi Contact Card view – checking status from different services; Tap Orkut message icon button.

**UI 5:** Compose Orkut message – add subject to the message; Tap on message box.

**UI 6:** Compose Orkut message – opens keyboard and compose message; Tap done button





**Use-Case 6 – UI flow 3 of 3**

**UI 7:** Compose Orkut message – Message now composed; Tap toolbar send button.

**UI 8:** Home Screen – notification from My SocioWorld

**Figure 36:** UI design flow mobile screen shots for use-case 6

## **4.6 User Usability Test**

The usability test for 'My SocioWorld' application is performed by active MSN users to evaluate; satisfaction, navigation, efficiency, general preference, ease of use and validate functionality. The following are the steps followed to conduct the usability tests.

### **Design**

Six different use-cases were evaluated in terms of overall usability of 'My SocioWorld' application. Conceptual designs, interaction flows and then detailed designs were made to understand the detail UI components. These designs tried to cover basic activities of SNS that user would perform almost daily or frequently. Like updating the status, like or comment on status, photos or links, add and save photos, add invites and check friends contact card. UI designs representing these activities were shown to the users in the test.

### **Equipment**

The Usability test was performed on paper prototype and on smart mobile phone - Nokia N900, which contained the prototype representing use-cases made using QML viewer and Flowella software. This software is used to make quick prototype that are not the final outcome of the application, but gives user the look and feel of the final application. This method was used so that the Users can understand actual touch feedback of the UI. Users were given basic instructions and guidelines to use the prototype.

### **Users**

To undergo the usability test six users were carefully selected under the following criteria's and the lists of the selected users for the usability test are listed under *Appendix 2*.

Mainly the criteria's were, the user should be using a smart touch mobile phone, secondly the user should be using and active on at least 3 different SNS, thirdly the user should be active MSN user and lastly the user age be from 19 to 40 years.

Users were given tasks to perform during the session. They were also allowed to examine the other aspects of the application and give their suggestions, while they answered the questionnaire.

### **Procedure**

A User was interviewed face to face in their common environment. The test procedure, which every test user was asked to follow, contained three phases.

The first phase is for *training* - The demo prototype was shown on smart mobile phone Nokia N900 and guidance to use the prototype was given in the beginning of the test. In particular user was described the use-case scenarios to give the context before performing the tasks.

The second phase is for *testing* - The User was asked to complete a predetermined set of tasks that covered the six use-cases. The tasks were the basic activities performed in day-to-day life. The session was intended to provide a basic usage experience of 'My SocioWorld' application by giving different kind of tasks to perform to make it easy for users to answer the evaluations questionnaire. The list of set task performed by the users during the usability test is provided in *Appendix 3*.

The third phase is for *evaluation* - After completing the tasks session, the user is asked to express their quantitative evaluation on the demo prototype of 'My SocioWorld' application's performance, by filling a usability test questionnaire. The questionnaire was drafted according to the three factors set for the usability test. Those factors are,

- *the functionality* – use
- *the efficiency* – concept
- *the convenience* – UI designs

Grouping of the questioner according to the three factors is shown in the *table 10*. The common factor of the three-factor group is the Application 'My SocioWorld'. The questions are divided in this three factor groups to receive an overall feed back from the Usability test (Ryu and Smith-Jackson 2006).

**Table 10:** Factor grouping of the questions asked on the usability test

<b>Common Factor</b>	<b>Factor Group</b>	<b>Item no.</b>	<b>Question</b>
<b>Application 'My SocioWorld' (MSoW)</b>	<i>The functionality</i> <b>Use of Mobile SNS (UMSNS)</b>	1	Are you cost conscious while using Mobile Social Networking (MSN)?
		2	Are you an active user of Social Networking Site (SNS) on mobile?
		3	Are you satisfied using Social Networking Site (SNS) on your mobile phone?
	<i>The efficiency</i> <b>Concept 'My SocioWorld' (CMSoW)</b>	4	Would you like an application that would integrate all the different Social Networking Site (SNS) into one application?
		5	Is it easy to install different Social Networking Site (SNS) into 'My SocioWorld' application?
	<i>The convenience</i> <b>UI Design 'My SocioWorld' (UIDMSoW)</b>	6	Is 'My SocioWorld' User Interface clear and understandable to operate?
		7	How do u feel while using 'My SocioWorld' application?
		8	Does 'My SocioWorld' include basic functionalities of Social networking?
		9	Is the amount of information displayed on the 'My SocioWorld' UI adequate?
		10	Give your feedback on UI designs of the tasks performed on 'My SocioWorld' application?

The questionnaire form contained ten questions based on these parameters. A five-point scale was used (1 = agree, 5 = disagree) for users to state their decision regarding the questions. The Usability test questionnaire for 'My SocioWorld' application is provided in *Appendix 4*.

Also the users were asked to speak aloud of their thoughts while performing the tasks and thus user can suggest their immediate feedback on the UI designs. These feedbacks were collected as qualitative evaluation. Qualitative evaluation results on the tasks will overall affect the outcome of the results from quantitative evaluation on 'My SocioWorld' application.

## Chapter 5 Results, Discussions and Enhancements

The smart devices, involvements with SNS, related work and motivation to contribute into MSN world, have resulted into development of ‘My SocioWorld’ application. Below mentioned results, discussions and enchantments are described in details for studies conducted in the thesis.

### 5.1 Results and Discussions

Here the results and discussions are the outcome from motivation and research questions stated in introduction chapter.

Different social networking sites were studied to understand different facts and features of those SNS. The expectation and the purpose of involvement of user in SNS on web or mobile interface, is to stay in touch with their social network like friends, family and to make new contacts for further socializing.

The transitions from web to mobile UI of different SNS were compared, to find and use common UI elements and their interaction patterns for developing ‘My SocioWorld’ application. The thesis uses UCD approach, where user needs and expectation are kept in centre of the design process. The realised needs from user current scenario of using MSN are demonstrated in proposed application. Also use-cases and UI designs were developed, tested and validated. Later, the usability test demonstrates that user’s experience of using the proposed application ‘My SocioWorld’ was acceptable. Thus the optimized approach enhances the user experience of ‘My SocioWorld’ application, which integrates different SNS into one application. It provides easy method of socializing in smart phone mobile device on the go and an intelligent interaction design to display information relevant to the user expectations.

The proposed application will benefit user by providing real-time information about friends and family (social networks), seamless integration of mobile tools to create new content and share with their social networks. Also it will benefit user with location, time of content creation, user context tags, user preferences, encourage users to use Wi-Fi network, reduce data usage cost and aware user of their expense. Overall keep users active on MSN by using ‘My SocioWorld’ application.

Thus, incorporating suggested enhancements would deliver the proposed application 'My SocioWorld' interaction designs as a decisive MSN application to be developed for a real time usage in mobile application world.

The below results and discussions are the outcome from usability test performed for proposed application 'My SocioWorld'.

The process to develop optimized approach is based on *figures 7 to 14*, which shows transition and comparisons from web UI to mobile UI of different SNS and *table 8 and 9* showing prioritize SNS and their UI elements. These syntheses of information build up concept for 'My SocioWorld' application as shown in *figure 18*. Six different use-cases and their UI designs were designed as shown in *figures 19 to 36* to understand functionality of proposed application. Further to validate these designs, the standard deviation and average of observation were calculated (*Appendix 5*) from the usability test conducted with potential users, which included both qualitative and quantitative question as shown in *table 10*.

**Table 11:** Usability test results of 'My SocioWorld' application

Users Profession		Engineer	Housewife	Designer	Manager	Student	Student	RESULTS	
		User 1	User 2	User 3	User 4	User 5	User 6	Average	Std. Deviation
QUESTIONS									
1	Cost Concious while using SNS	1	1	3	4	1	1	1.83	1.21
2	Active SNS user on mobile phone	1	2	1	3	1	2	1.67	0.75
3	Satisfied using SNS on mobile phone	5	3	5	3	5	4	4.17	0.90
4	Integrated app or different SNS	1	2	1	3	1	1	1.50	0.76
5	Installing 'My SocioWorld'	1	2	1	2	1	2	1.50	0.50
6	My SocioWorld' UI clear to understand	1	3	1	2	1	2	1.67	0.75
7	Feeling while using 'My SocioWorld'	1	1	1	2	1	2	1.33	0.47
8	My SocioWorld' include basic functionalities	1	1	1	2	1	2	1.33	0.47
9	Adequate Information on UI	1	3	2	3	1	3	2.17	0.90
10	Feedback on UI design on the tasks	1	2	1	2	1	1	1.33	0.47
Average		1.4	2	1.7	2.6	1.4	2	1.85	0.42

Index: ( 1 = agree ; 5 = disagree)

By performing the usability test for 'My SocioWorld' application, users acceptance of application and responses to use-case UI design were recorded which is listed and summarized in *table 11*. Also from the usability test, detail evaluation, observations, physical interactions and qualitative suggestions received from the users helped to enhance UI design of 'My SocioWorld' application.

The usability test results of 'My SocioWorld' application shows user 1 and user 5 appears to have agreed, liked and satisfied using 'My SocioWorld' application in regards to all the questions asked to them in usability test. They replied all the questions by giving highest score of 1 = agree, showing how much they appreciate the application and are ready to use it as their only MSN solution in their day-to-day life. Also in the question 3 both the users 3 and 5 suggested that they were very conscious about cost and data charges incurred while interacting on mobile social networking.

The scores from Question 7, 8 and 10 suggest that most of the users were comfortable using the application. They were satisfied while using 'My SocioWorld' application to perform basic functionalities of socializing, which they would usually perform on their SNS. Also they communicated that the best part of performing this functionality was the unified combination of mobile applications to the social networking sites and the ease of creating, consuming and sharing information to and fro from the services through 'My SocioWorld' application.

Further, below are the qualitative and quantitative results in details followed with discussions of individual usability test question for proposed application.

*Question 1 – Are you cost conscious while using SNS?*

Four users stated that they were conscious about the amount of data charge / money they spent on mobile-internet while using SNS from their mobile. While the remaining two users were little conscious as their bills were paid by their companies. This shows that if the users have Wi-Fi available or Wi-Fi use is pushed by services they would happily use them instead of using 3G networks.

*Question 2 – Are you active user of Social Networking Sites (SNS) on mobile?*

Most of the test users were active mobile SNS users. As they use SPMD with internet facility they have access to SNS on web or as applications. Users frequently communicate with their friends and social networks by interacting on their posts or by uploading photos, status, links etc.

*Question 3 – Are you satisfied using SNS on your mobile phone?*

Half of the users were not satisfied using SNS on mobile in current scenario, reason being – high cost of usage, opening different applications for viewing different SNS and the mobile tools did not support to enhance the use of MSN. Other three users were also not so convinced with the current usage scenario of MSN.

*Question 4 – Would you like an application that would integrate all the different SNS into one application?*

Four users showed a lot of enthusiasm on the thought of having such kind of application, which would integrate all different SNS into one common mobile application. This shows active MSN users would easily accept and start using this new application 'My SocioWorld'.

*Question 5 – Is it easy to install different SNS into 'My SocioWorld' application?*

Most of the users without any problem could easily add their favourite SNS on 'My SocioWorld'. Once these sites were synchronized users could start using 'My SocioWorld' application smoothly. As start up UI designs were precise, simple to understand and interact.

*Question 6 – Is 'My SocioWorld' user interface clear and understandable?*

Most of the users found UI designs of 'My SocioWorld' application clear and easy to use, as the UI showed users the content that they expected to see while interacting with application. Moreover users communicated that they do not expect to see the similar amount of content as on web UI.

*Question 7 – How does it feel using ‘My SocioWorld’ application?*

Most of the users felt comfortable using ‘My SocioWorld’ application, as they could perform given set of tasks with ease and in time, even though user interacted with ‘My SocioWorld’ application for the first time. Also it was observed and communicated that there were different ways of reaching to the set task that was found interesting.

*Question 8 – Does ‘My SocioWorld’ include basic functionalities of Social Networking?*

Almost all users agreed on being able to perform the basic functionalities of Social networking. It was communicated that most of the functionalities user perform in a scattered fashion on different SNS, are now found in this one common application. Also users noticed the seamless integration of mobile applications / tools and SNS that would help them to create new content and be more active while socializing.

*Question 9 – Is the amount of information displayed on ‘My SocioWorld’ UI adequate?*

Three users who were more active on dedicated SNS expected more information to be displayed on UI. While others three users who were average users found the displayed information satisfied.

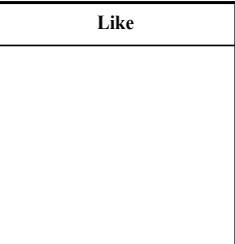
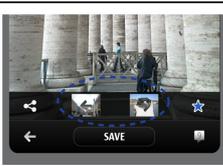
*Question 10 – Give your feedback on the UI designs of the tasks performed on ‘My SocioWorld’ application?*

After performing the given set of tasks on ‘My SocioWorld’ application, users found UI designs of ‘My SocioWorld’ application easy to perform, efficient UI to navigate, satisfied by easy access to mobile functionalities, display of useful information, simple UI designs and easy application to understand (*Appendix 6*).

## **5.2 Enhancements**

Based on the detail evaluation, observation, essential feedback and suggestions received from the users while performing usability test are amended as enhancements to the proposed application UI design. These enhancements are as summarized below in *table 12*. Mainly users’ interaction with prototype of proposed application ‘My SocioWorld’, suggested some enhancement of visual and UI element.

**Table 12:** List of UI designs enhancement for 'My SocioWorld' application

No.	View name	Like	Dislikes	User Suggestions	Proposed UI Refinements
1	Add Service view			"Add button near the service name is not understood, it would be good under the password".	
2	Birthday view			"Option to wish the friend directly from this view would be a good feature to add".	
3	Add Status			"I like this kind of shortcut makes it easy to add new content to my services. So are there were more applications after this?"	
4	Friends view			"It would be nice to see friend's name eventhough I know them and the name need not be presnt all the time but can disappear after few seconds".	
5	My SocioWorld view			"The visualization of activities can show more information as its not very clear what kind of activities it shows here".	
6	My SocioWorld view			"Time stamp showing when 'My SocioWorld' was last updated is needed when I use Wi-Fi to connect".	
7	Picture view			"It would be nice to see the photo just viewed and next coming photos like flickr does".	
8	Share view			"I like the share view allows me to uploads a photo in many services and pushes me to use Wi-Fi. But how is multiple photos uploading handled?"	
9	Contact Card view			"I very much like the contact card view on 'My SocioWorld', as it shows me all the information connected to one friends. Can I personalise this view?"	

Some of the functionality / view liked by the users are:

- *Add functionality*, which provided shortcut to add different content quickly to 'My SocioWorld' and found the functionality very convenient to use. While some users suggested to show small label / description to respective buttons.
- *Share view*, which was liked by the users because of the possibility provided on the view to upload a photo to many SNS at the same time. But some users had concerns about the UI representation when multiple photos are shared through this view and some other users were confident that the view would handle multiple photo shares smoothly.
- *Contact card view* of a friend was very impressive to almost all the users. They found the view to be very useful as it collected all the information from SNS, contact information from the phone's address book and everything related to that particular friend. Some users showed a concern and wanted to personalize the view.

Some of the functionality / view not liked / not understood by the users and there suggestions for enhancements are -

- *Birthday view*, have 'created event' button but the users suggested; the view could also include 'send wish' button to be able to greet a friend directly from this view.
- *Friends view*, which showed only friends photo was expected to display those friends name visible along with the friend's photo. While some other users suggested, the friends name need not be visible all the time but can vanish out after few seconds.
- In *My SocioWorld view*, users expected additional usage information like time stamp of last updated information on 'My SocioWorld' application. This was essential for users who used Wi-Fi connection to know when was the last time application was updated or used.

- *Picture view*, was liked by the users in general as the view displays the picture in full screen mode making it possible for user to enjoy the viewing of picture. But users also expected and wanted to have thumbnails of next and previous picture visible on the view.

The above 'like' and 'dislike' view / functionality are shown in list of enhancement to UI design shown in *table 12*. The table's columns contains view name column i.e. the title of UI design; 'like' column i.e. UI elements liked by the users during usability test; 'dislike' column i.e. UI elements unclear by the users during usability test; user suggestions column i.e. the feedbacks and suggestions given by the users while performing usability test and proposed UI enhancements i.e. new UI designs developed on the bases of suggestions obtained from the users and enhancements to the earlier UI designs.

Thus, the enhancement provides add on to some important and necessary functionality that were missing in the earlier UI designs. All necessary changes and suggestion are incorporated into 'My SocioWorld' application, which enables UI designs to become more consistent effective and user friendly throughout the application.

## Chapter 6 Conclusion and Further Studies

### 6.1 Conclusion

Making efforts to study the challenges to design interactions (Rana et.al. 2009) and compare different kinds of SNS brought to understand different taste and habits of users would expect and want to have into a common application for MSN. With the increasing advancement of technology in mobile world and MSN users (Gauntt 2008), the focus in designing MSN application ‘My SocioWorld’ would ease life of users very much into their day-to-day activity to create, edit, share and consume (Savla and Roto 2009).

The challenge to design application interaction design is not only the process that provides the solution to optimize MSN, but series of mobile activities and tools have to be considered. The interaction design process of ‘My SocioWorld’ application integrates different SNS, creating and sharing new content like status, photos, links, location, calendar and event, holistic contact card and cost efficient method would optimize the application to allows user to interact on MSN more efficiently and effectively. The prototype of application was evaluated by performing usability test with potential MSN users. This resulted in acceptance of proposed application ‘My SocioWorld’ with some suggested enhancements.

The focused approach to design an application helped author to develop an optimized MSN application and its related activities. In addition, the application ‘My SocioWorld’ contributed to the field of social networking by providing an optimized MSN solution suited for use in any smart devices. The MSN users in social networking world are expected specifically to benefit from this approach. It emphasizes the need to provide convenient, effective and easy method of mobile socializing to end-users.

Thus it can be concluded from the preceding discussion ‘My SocioWorld’ application has re-defined a new way of optimizing mobile social networking on today’s smart mobile phone device.

## **6.2 Further Studies**

Based on the evaluation of developed application 'My SocioWorld', there are some scopes for further studies to enhance user experience by applying advanced techniques of UI navigation and multi-touch interaction gestures for more information and easiness (Ruiz, Lank, and Yang 2011).

UI designs will be more attractive by enhancing visual designs or graphics like adding interactive animations. By incorporating, more contexts-aware questionnaires, user samples that would further enrich usability test results (Ryu and Smith-Jackson 2006). In addition user samples could be expanded from expert, lab and field evaluation (Nicholas 2010).

The user's experiences and suggestions obtained while performing usability test reveals that there is a real demand and market need for such MSN application. An effective software development life cycle (SDLC) could be commenced for the production of 'My SocioWorld' application and its enhancements as a promising direction for future work.

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## Appendices

### Appendix 1: Major social networking sites

Sr. No.	Social Networking Sites	Sr. No.	Social Networking Sites
1	Bebo	16	MySpace
2	Delicious	17	Netlog
3	Facebook	18	Ning
4	Flickr	19	Orkut
5	FourSquire	20	Spotify
6	Friendster	21	StumbleUpon
7	Googlebuzz	22	Tagged
8	Gowalla	23	Tripit
9	Habbo	24	Tumblr
10	hi5	25	Twitter
11	Jaiku	26	Wayn
12	Lastfm	27	Windows live space
13	Linkedin	28	Xing
14	MocoSpace	29	Yelp
15	Mylife	30	YouTube

### Appendix 2: Usability test user information

#### Usability test user details

Users	Gender	Age	Profession	Mobile Phone	Location
1	Male	28	IT Engineer	Nokia E7	Helsinki
2	Female	26	Housewife	Nokia N8	Helsinki
3	Female	30	Designer	iPhone 4	Helsinki
4	Male	32	Manager	Nokia N900	Helsinki
5	Female	20	Student	iPhone 4	Helsinki
6	Male	32	Student	iPhone 3GS	Helsinki

### **Appendix 3: Usability test set-of-task**

#### **Usability test pre-determined set of tasks**

1. Add Facebook, Flickr and Twitter accounts.
  - a. Username: nandita.s
  - b. Password: T123456
  
2. Add new status to Facebook and Twitter.
  - a. Status - The metro seems to be surprisingly empty what could be the reason?
  
3. Check activities on Facebook.
  - a. Like a friends Madhu's status on Facebook.
  
4. Comment and like on friend Sami's photo on Facebook.
  - a. Comment - Very beautiful shot...!
  
5. Save Sami's Photo into your mobile phone.
  
6. Take picture and share it.
  - a. Share to 'My SocioWorld' Facebook and Flickr on Wifi.
  
7. Your friend has birthday tomorrow create a surprise party invite.
  - a. Title - Surprise birthday party
  - b. Date - tomorrow's date
  - c. Time - 7:00 pm till 11:00
  - d. Event - Private
  - e. Add friends - Anna, Sami, Anu, and Sam
  - f. Send invites to all the friends
  
8. Check Madhu's contact card and send Orkut message to Madhu.
  - a. Message - Where are you and when can we meet next? Call me soon.

**Appendix 4: Usability test questionnaire**

**Usability test questionnaire for ‘My SocioWorld’ application**

User Mobile Phone Model:

Age and Gender:

Profession:

Place, Date and Time:

Which SNS do you use on your mobile phone?

Facebook	Orkut	Twitter	Flickr	Linkedin	Tripit	YouTube	Spotify	MySpace

Others SNS - \_\_\_\_\_.

**Questionnaire to be filled after completing the tasks: (1 = agree; 5 = disagree)**

No.	Questions	1	2	3	4	5
1	Are you cost conscious while using Mobile Social Networking (MSN)? Why?					
2	Are you an active user of Social Networking Site (SNS) on mobile?					
3	Are you satisfied using Social Networking Site (SNS) on your mobile phone? Why?					
4	Would you like an application that would integrate all different SNS into one application? Why?					
5	Is it easy to install different SNS into ‘My SocioWorld’ application? Why?					
6	Is ‘My SocioWorld’ User Interface (UI) clear and understandable to operate? Why?					
7	How do u feel while using ‘My SocioWorld’ application? Why?					
8	Does ‘My SocioWorld’ include basic functionalities of Social Networking? Why?					
9	Is the amount of information displayed on the ‘My SocioWorld’ UI adequate? Why?					
10	Give your feedback on UI designs for the tasks performed on ‘My SocioWorld’ application? Why?					
	Easy to perform					
	Efficient					
	Satisfied					
	Useful					
	Simple					

**Appendix 5:** Mathematical formula used for calculations

**1. Average**

$$A = \sum (X_1+X_2\dots X_n) / N$$

Where, A = average

X<sub>1</sub>+X<sub>2</sub>...X<sub>n</sub> = observations

N = total number of observations

**2. Standard Deviation**

$$\sigma = \sqrt{\frac{\sum(x - \bar{x})^2}{N}}$$

Where, σ = standard deviation

x = each value in the data set

$\bar{x}$  = mean of all values in the data set

N = number of value in the data set

**Appendix 6:** Usability test results of question 10

VARIABLE	Engineer	Housewife	Designer	Manager	Student	Student
	User 1	User 2	User 3	User 4	User 5	User 6
Easy to perform	1	2	2	3	1	1
Efficient	1	3	1	2	2	2
Satisfied	2	2	1	2	1	1
Helpfulness	1	1	1	3	2	2
Simple	1	2	1	2	1	1
<b>Common score</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>

Index: ( 1 = agree ; 5 = disagree)

## Key Terms and Definitions

*Adaptive User Interface* - “A computer interface that adapts the interaction guided by a model of a specific set of factors” (Streetkerk et.al. 2008).

*Application* - “Pieces of software usually created by third party developers, that interact with the core feature of a SNS e.g. games, maps etc.” (Social networking 2008).

*Context Aware Technology* - “Technology that models a set of factors about the use context to adapt the interaction with the user” (Streetkerk et.al. 2008).

*Empirical Evaluation* - “An evaluation method in which results are derived by observation or experiment instead of theory” (Streetkerk et.al. 2008).

*Facebook* - “One of the three most popular in USA, Europe and Asia, founded in 2004” (Social networking 2008).

*Flickr* - “A SNS based around photo and video sharing” (Social networking 2008).

*Linkedin* - “A SNS based around business networking” (Social networking 2008).

*Mobile Social Networking* - It is a social networking where one or more person is connected via mobile phone.

*Requirements Analysis* - “An analysis method during the analysis stage in which the user needs and requirements for design solutions are specified” (Streetkerk et.al. 2008).

*Social Networking Site* - “A site, which allows users to create a person page or profile and construct display social networks of their only contacts” (Social networking 2008).

*Twitter* - “A Popular messaging SNS and blog, launched in 2006” (Social networking 2008).

*User Centred Design* - “A design methodology in which end-users needs and requirements guide the design choices” (Streetkerk et.al. 2008).

*User Experience* - “The set of cognitive, affective and social responses that are induced by the use of a product or service” (Streetkerk et.al. 2008).

*User Generated Content* - “A online content that is produced by the user or consumer of the site, e.g. blogs, photos and videos that users upload” (Social networking 2008).

*YouTube* - “A popular video sharing SNS founded in 2005” (Social networking 2008).

