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Mobile Social Media Business Models

Master's Thesis
Espoo, May 25, 2009

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ABSTRACT OF MASTER'S THESIS

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Social media services have recently become very popular in the Internet. At the same time, mobile technology has evolved to enable accessing these services and features such as GPS positioning and cameras have become common. However, mobile social media services have not become as popular as could have been predicted. Uncertainty regarding the services are high, and different services are experimented.

The revenue models that are used in desktop WWW based social media services cannot directly be used in the mobile environment. Mobile phones have small screens, which limits the usefulness of advertisements. Revenue sharing between the service provider and device manufacturers or mobile network operators are possible.

In this thesis, valid mobile social media business models are tried to be identified. Four distinct scenarios for mobile social media services are found, based on their openness and design principles. A framework for comparing mobile social media services is created, and existing mobile social media services are compared using this framework. Based on the comparison, reasons for the slow growth of services and aspects which should be considered for accelerating the service adoption are identified. Finally, the future implications for mobile social media services on the telecommunications industry are discussed.

Keywords: Mobile services, social media, business models, service diffusion, network externalities
Language: English

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Sosiaalimediapalvelut ovat viime aikoina kasvattaneet suosiotaan nousten Internetin käytetyimpien palveluiden joukkoon. Samalla mobiiliteknologian kehitys on ollut nopeaa, ja yhä monipuolisemmat palvelut ovat mahdollisia. Sosiaalmediapalveluiden käyttö mobiiliympäristössä ei kuitenkaan ole yleistynyt odotusten mukaisesti. Markkinaepävarmuus on vielä korkea, ja erilaisia palveluita kokeillaan menestyvän palvelun löytämiseksi.

WWW-pohjaisten sosiaalimediapalveluiden liiketoimintamalleja ei voida suoraan käyttää mobiiliympäristössä. Näytön koko rajoittaa mainostusmahdollisuuksia, jolloin esimerkiksi yhteistyö laitevalmistajien tai teleoperaattoreiden kanssa voi tulla kyseeseen.

Diplomityössä etsitään kestäviä mobiilisosiaalimediapalveluiden liiketoimintamalleja. Uudelle palvelulle löytyy neljä erilaista skenaariota riippuen palvelun avoimuudesta ja suunnittelulähtökohdista. Työssä rakennetaan mobiilisosiaalimediapalveluiden vertailuun sopiva vertailukehys, ja nykyisiä palveluita vertaillaan sen avulla. Lisäksi tunnistetaan syitä palveludiffuusion hitauteen ja tekijöitä jotka voisivat nopeuttaa diffuusiota. Lopuksi tarkastellaan mobiilisosiaalimediapalveluiden merkitystä tulevaisuuden teleliiketoimintakentässä.

Avainsanat: Mobiilipalvelut, sosiaalimedia, liiketoimintamallit, palveludiffuusio, verkostoeksternaliteetit
Kieli: englanti

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Finishing my Master's Thesis has been my goal during the majority of my stay in Otaniemi. As I have lived my entire life here, it has indeed been a *long-term* goal. Now it is finally done.

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Abbreviations and Acronyms

AJAX	Asynchronous JavaScript and XML
API	Application Programming Interface
GSM	Global System for Mobile Communications
CSS	Cascading Style Sheets
GPS	Global Positioning System
HTML	HyperText Markup Language
IP	Internet Protocol
IPR	Intellectual Property Rights
J2ME	Java 2, Micro Edition
JSON	JavaScript Object Notation
JSR	Java Specification Request
MIDP	Mobile Information Device Profile
MMS	Multimedia Messaging Service
MNO	Mobile Network Operator
MSA	Mobile Service Architecture
NFC	Near Field Communications
POS	Point-Of-Sale
SDK	Software Development Kit
SMS	Short Message Service
SMTP	Simple Mail Transfer Protocol
SSO	Single Sign-On
STOF	Service, Technology, Organization and Finance
UMTS	Universal Mobile Telecommunications System
WWW	World Wide Web
XML	Extensible Markup Language
XMPP	Extensible Messaging and Presence Protocol

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Chapter 1

Introduction

1.1 Background

From the early 2000s, services on the Internet have become a very important part in people's lives in most parts of the world. User-generated content has rapidly become the trend, and services based on that have grown from small-scale applications to very popular giants[21]. The services feature social aspects, such as personalized profiles, contact lists and messaging between users. These social media services are mostly desktop WWW based, though, and not very suited for mobile applications. At the same time, mobile phones have technically evolved enormously and are revolutionizing the whole service landscape. The amount of phones capable of accessing Internet services is rising steadily according to market research[35], which creates pressure to implement social media services on mobile platforms as well. Usage of the desktop web based services is usually free and ad-supported, which creates many challenges creating a suitable business model for the mobile environment. There are many definitions for a *business model*, but in this study it defines the technological and operational functionality in addition to the revenue sources.

Recently the amount of mobile social media service users has been growing, but still is very low. As of late 2008, market research reports show that 10% of mobile subscribers use mobile social media services[52] in the USA and less than 10% in Europe[22]. As the industry is in constant movement, continuous research is needed to evaluate future possibilities and the implications to the whole mobile business.

Social networking services is a mostly identical term to *social media services*,

although some studies have differentiated social media to include user provided image or video files. In this study, the differentiation is not made and only *social media services* is used.

1.2 Research Objectives and Scope

The research objectives for this study are to find reasons why mobile social media services with viable business models have not gained popularity despite the increasing penetration of devices capable of using such services. Also, this study attempts to identify ideal aspects in a successful mobile social media service and how social media services could change the mobile service market in the future.

This study is limited to the current major social media services using English as the primary language and used primarily for entertainment purposes. The study does not include legal or IPR issues regarding mobile services, which might arise when connecting several different services together.

1.3 Research Methods

The research methods consist of scenario analysis and qualitative multiple case study using desk research. Scenario analysis is used to categorize mobile social media services into scenarios for structural identification. The scenarios are constructed with explorative research. Then, current mobile services are placed into the scenarios. Significant existing services representing their scenarios are chosen for the multiple case study. For the case study, a new framework suitable for mobile social media services is created based on existing research. Using the framework, the cases are compared to identify the best practices and reasons for slow adoption of these services. The case study is done using desk research[92].

1.4 Thesis Structure

A literature study consisting of traditional innovation theory, technology diffusion and dominant design theory and mobile service business specific research is presented in Chapter 2. Chapter 3 describes the mobile environment from a technology perspective, while Chapter 4 describes social media

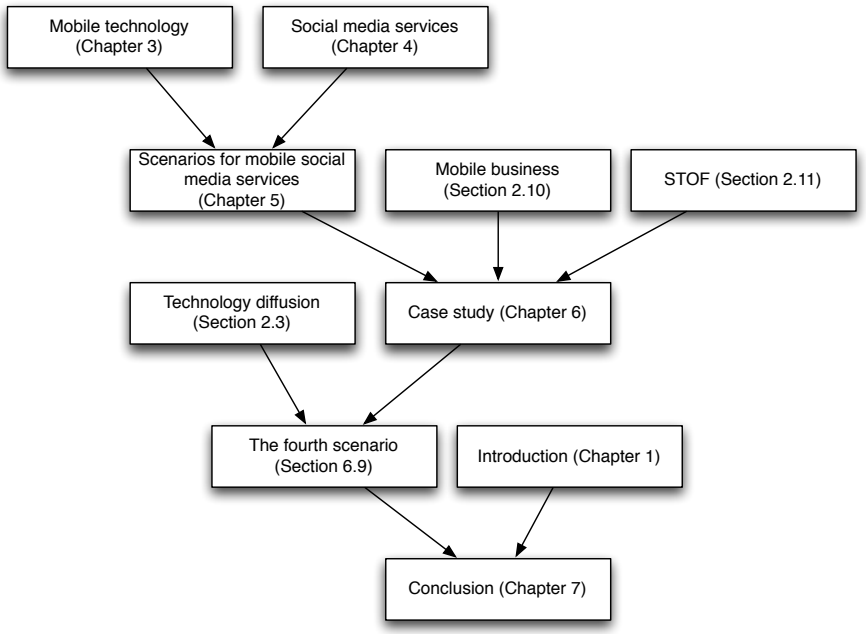

Figure 1.1: Structure of the thesis

services in general. Then, implementation scenarios are constructed and analyzed in Chapter 5. The multiple case study is presented in Chapter 6 and the conclusion ends the thesis with Chapter 7. Figure 1.1 illustrates the structure of the thesis.

1.5 Related Research

Existing research in the field of mobile social media services is sparse, though a paper has been presented with a different point of view by Zhong et al[93]. Ziv has categorized mobile social media as an umbrella category containing mobile social networking and mobile dating services, emphasizing the importance of dating services[94]. Social media services for the fixed Internet have been researched with different aspects, such as social group formation[9] and privacy issues[43].

Chapter 2

Literature Study

The literature study includes aspects related to the introduction of new ideas and products into the markets and mobile service business models in order to form the requirements for implementing successful and financially viable new mobile services. In the study a mobile service business model specific framework is also presented as a basis for a more customized framework in Chapter 6.

2.1 Innovations

Innovations are widely regarded as inventions which have been successfully commercialized to markets[79]. The innovation process involves the introduction of some new technology or idea to the market and the diffusion of the technology or idea to the users (see Figure 2.1). The diffusion process is covered in Section 2.3.

In history, innovations have been grouped into different waves, grouped by a main technological element leading the wave[23]. These include mechaniza-

Figure 2.1: Innovation stages, adapted from [79]

tion, steam power, electrical engineering and mass production. Currently, a fifth wave, ICT wave, is thought to be the major driver of innovations and the next wave is speculated to be biotechnology. However, the wave theory has been criticized, as technology development has accelerated to new heights.

2.1.1 Forms of Innovation

Innovations have been generally categorized into three different forms, product innovations, service innovations and process innovations[79], although innovations can include aspects from every category as well.

Product Innovations

Product innovations are the most general form of innovation. Consumer products are the archetype of product innovations, and are understood very well because of their tangibility.

Service Innovations

Service innovations are less tangible than product innovations, but are very important in the business model development sense. The Internet has made a whole genre of service innovations possible, and the convergence of mobile technology and Internet provides a new boost for mobile service innovations.

Process Innovations

Process innovations are very intangible to an average individual. They usually reside in the bigger picture impacting whole societies. In a process innovation, a manufacturing or development process is streamlined and improved, producing better results with fewer resources.

2.1.2 Types of Innovation

Innovations can be categorized simply to two different types: incremental and radical depending on the changes to existing state-of-the-art[23]. Smith and Schilling extend them to four types: incremental, architectural, modular and radical innovations[79, 72]. As with the forms of innovation, the types

of innovation are not strict and a new innovation can belong into many categories.

Incremental Innovations

Incremental innovations are basically improvements to existing innovations using them as the base. The structure of that innovation is kept the same, but its components are upgraded. This type of innovations is the most common type.

Architectural Innovations

Architectural innovations include a new structure of existing components. These innovations can include completely new combinations with relatively small development costs, as the components exist already.

Modular Innovations

Modular innovations retain the same structure of an existing innovation such as with incremental innovations. The components, however, are very different or changed from the previous innovation to for example enable new usage scenarios for existing products.

Radical Innovations

Radical innovations are different both in the structure and the components themselves and usually feature a completely new technology. They are quite rare, but they have the potential of being discontinuous (see Section 2.5).

2.2 Uncertainty

Uncertainty in general refers to the inability to know whether a certain event happens or not, or which event happens from a group of events. In the telecommunications technology context, it refers to the selection of a technology to be most useful or if another technology will be better, as technology advances at a rapid pace.

Market uncertainty refers to the inability to know whether a product or a service is adopted by users or not[36]. Gaynor argues that when the market

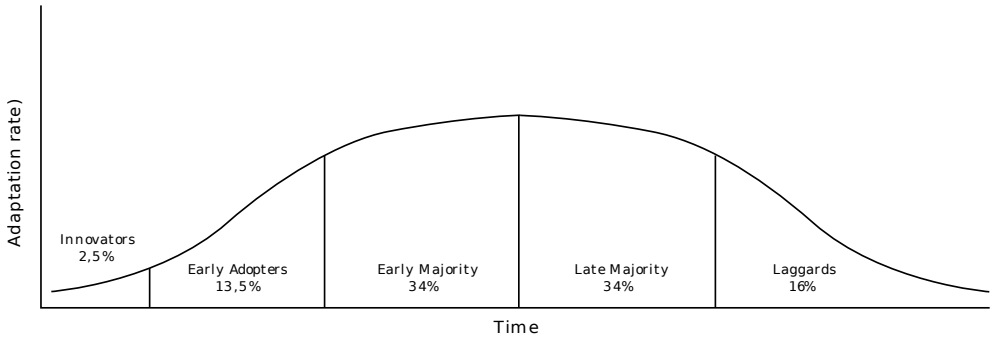

Figure 2.2: Diffusion over time (adapted from: [70])

uncertainty is high, the competition is based on feature differentiation, and being right about the correct features produces more revenue than when the market uncertainty is low as then the competition is based on price differentiation. In high uncertainty, different ideas should be tried out to see which would be adopted. Gaynor proposes that the adoption of a technology should be staged, so that the alternatives could be considered also after an initial adoption had been done.

2.3 Technology Diffusion

Technology diffusion is the process where a new technology or idea gains users. Usually the technology diffusion takes place in steps. Rogers described the successful diffusion process with a cumulative S-curve[70]. The technology diffusion process is illustrated in Figure 2.2.

2.3.1 Adopter Categorization

The persons who adopt the innovation can be categorized to five distinct groups based on their innovativeness, i.e., their tendency to adopt new technologies [70]. First, a group called innovators adopts a new technology or product. Then, early adopters, early majority, late majority and finally laggards adopt the technology.

Innovators

Innovators thrive on new ideas and trying them out. They need technical expertise and have to be able to cope with a high degree of uncertainty related to technology. Innovators typically also need resources to be able to invest in new innovations. On the other hand, innovators tend to socialize with other innovators and less with the rest of the society. This slows down the diffusion process as well, as the benefits of the innovation are not communicated to others.

Early Adopters

Early adopters are more integrated into the society than innovators, as they are more similar to the average individual. They are usually opinion leaders, and will really trigger the adoption rate growth for the rest of the population. Early adopters are sought for advice regarding new innovations. They cope with less uncertainty than innovators, but still more than the later adopters.

Early Majority

The early majority aren't as much opinion leaders as the early adopters, but still adopt a technology before an average individual. They provide links to the rest of the people, but are willing to wait and see until other prove an innovation to be useful.

Late Majority

The late majority can be described as sceptical. They adopt the innovation generally because of peer pressure. They have fewer resources available than the previous categories, and do not cope with uncertainty regarding new technology.

Laggards

Laggards base their decisions on the experience of the past, and their social circles consist of other laggards. They do not possess many resources, which limit their abilities to invest in new innovations as well.

2.3.2 Innovation-Decision Process

Each new person who learns of a new innovation goes through an innovation-decision process. The process consists of five different stages, knowledge, persuasion, decision, implementation and confirmation[70].

Knowledge

The innovation-decision process begins with the knowledge stage. In this stage, an individual becomes aware of the innovation and understands how the principles of it. Awareness of the innovation can be reached either passively, when randomly encountering the innovation or actively, when seeking out solutions for a particular need. A need can also be created when the individual learns of a new innovation.

Persuasion

In the persuasion stage, an attitude towards the innovation is formed. The attitude can be either favourable or unfavourable based on the perceived relative advantage, compatibility and complexity. The individual tries to mentally apply the innovation to current or future needs, and uncertainty is weighed at this stage. The uncertainty can depend on the amount of other innovation adopters and will be discussed in later sections.

Decision

The decision stage contains the most major element of the process, adopting or rejecting the innovation. A trial or demonstration can help in making an adopting decision. The rejection can also happen after a prior adopting decision, where the decision is called discontinuance.

Implementation

In the implementation stage, the innovation-decision process changes form from mental to more physical and the innovation is taken into actual use. Some technical uncertainty remains in this stage related to actual usage situations. Sometimes, when the innovation is taken into use, the users find alternative uses than what was originally thought. This is described as re-invention, and it has happened widely on the Internet. Re-invention can

occur more if the original innovation was designed for it. Also, the whole innovation is adopted faster if re-invention occurs. The implementation stage will continue until the innovation is completely absorbed as standard behaviour.

Confirmation

A fifth stage, confirmation, can occur after the actual adoption, if the user still has some uncertainty regarding the innovation. The uncertainty is described as dissonance. In this stage, the user tries to avoid dissonance or reduce it. It is possible to make a discontinuance decision, i.e., stop using the technology, if the user is not satisfied with the performance or if there is a new, better innovation available.

2.3.3 The Chasm

Moore argued that there is a distinct gap, *the chasm* between early adopters and early majority when adapting disruptive innovations, although giving the categories different names than Rogers: innovators are technology enthusiasts, early adopters are visionaries, early majority are pragmatists, late majority are conservatives and laggards are sceptics[54]. The early adopters are willing to invest into the innovation because they see it as potentially disruptive, but after a while, they lose their interest in it and begin to seek out other new innovations. The early majority on the other hand need to know that other people in their category have invested into the innovation before making their decision, which creates the chasm. In Moore's opinion, the only way for the innovation to cross the chasm is to provide a complete solution to an existing problem, which would motivate the early majority to adopt it.

2.3.4 Attributes of Successful Innovations

Rogers has listed five attributes that contribute to the rate of adoption for an innovation: relative advantage, compatibility, complexity, trialability and observability[70].

Relative Advantage

Relative advantage is used to compare the innovation to previous or competing ideas. Usually it is measured by price and performance, but sometimes the relative advantage can be measured with social status as well.

Compatibility

Compatibility or incompatibility of the innovation with existing values, beliefs and experiences is highly personal. Culture can affect the values and beliefs to a great extent, and an innovation can be very incompatible with certain cultures. Past experiences on similar innovations can affect the adoption of the new innovation positively or negatively, too. Also, compatibility with existing technologies or products that the user has adopted is important.

Complexity

Perceived complexity or simplicity, or the difficulty of understanding and using the innovation, can greatly affect the adoption of highly technical innovations. The importance of complexity varies by the target market. In niche markets with technically oriented individuals, complexity is not as important as with whole societies.

Trialability

Trialability is described as the possibility to first experimenting with the innovation before adopting it. Trialability is described to be more important to the early adopters than the later ones, as they do not have others who have already tried out the innovation.

Observability

Observability means the visibility of the results of using the innovation. If the adoption of the innovation is visible, others will notice it more easily which speeds up the rate of adoption. Also, observability helps to promote the social status advantages too.

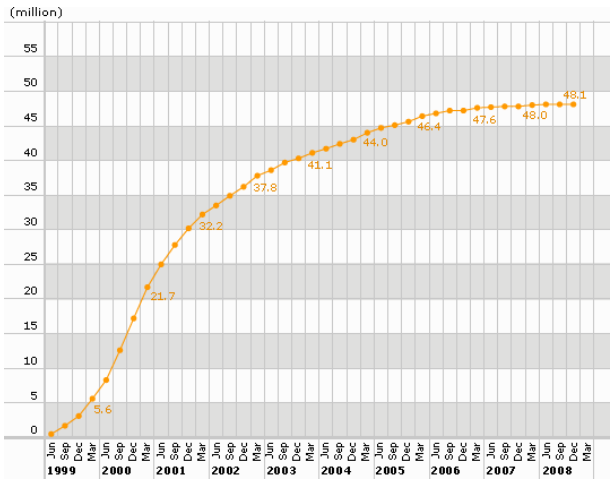

Figure 2.3: i-mode subscriber growth (source: NTT DoCoMo)

2.3.5 Case i-mode

An example of a new technology adaptation is the launch of Japan's leading mobile operator NTT DoCoMo's i-mode product suite in 1999. i-mode offered a variety of services accessible directly from the mobile phone. In a few years, the total user base reached 87% of NTT DoCoMo's customers[6]. The subscriber growth data follows an S-curve very well[44], see Figure 2.3.

There are several reasons for i-mode's success[6]. One is that the variety of mobile phones was controlled by the network operator, NTT DoCoMo, and was preconfigured to support i-mode, making it very easy for the end users to access the services. Also, service implementation was made attractive for third parties as they received a 91% share of the revenues, although the services themselves were not very expensive. Incidentally, a non-technical person designed the whole i-mode service concept. When taking the attributes for successful innovations from the last section into account, it seems that i-mode had all the necessary elements in theory as well.

2.4 Network Valuation

A network can refer to the users of a certain technology, product or service. New users can make decisions between joining different networks based on the value they would get from joining a network. Valuating a network is very difficult, as the value to a user can be different than another user's.

Some estimates have been proposed base on the size of the network, such as Metcalfe's Law:

$$v = n^2 \tag{2.1}$$

Which states that whenever a new user connects to the network, any existing users and the new user can connect to each other, creating new value. However, it is very unlikely that in large networks a new user will want to connect to everyone else, thus limiting the usability of the law. Another similar law has been proposed[18, 62]:

$$v = n * log(n) \tag{2.2}$$

This takes a more careful approach to valuating networks based on their sizes. Metcalfe's Law has also been described to only value networks in their very infant stages whereas Equation 2.2 would apply to larger sized networks as well[85].

Generally, when the value of an innovation grows with the amount of other users using it, network effects are said to apply[73, 24]. A concept of critical mass is used to describe a general amount of users after which the technology diffusion growth accelerates on its own due to enough network effects for a new user[70, 25]. At critical mass, the value of joining the network is larger than the cost of joining it.

The number of other users in the network an individual requires before adopting the innovation is called a threshold[70]. The thresholds can vary individually, but are lower for innovators and higher for late adopters.

2.5 Switching Costs and Lock-In

Once an user is using a certain technology, product or service, the time and resource consumption associated with changing to another one is called the switching cost. When the switching costs are high, a customer is has a lock-in to that technology, product or service[73].

Lock-in is an important feature in many product suites, which consist of more than just the core product. Additionally, they include accessories, supporting services and compatible upgrades. Standardization makes switching costs low, while proprietary technology has high switching costs. Lock-in is profitable for the seller, but customers try to minimize it as much as possible.

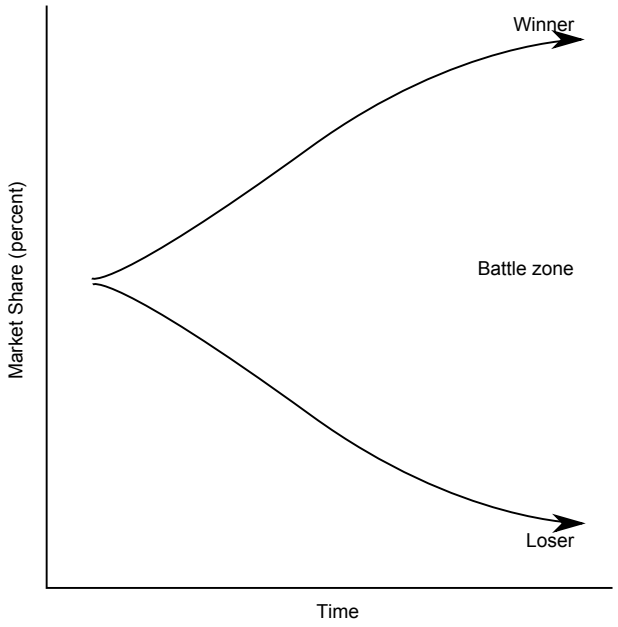

Figure 2.4: Positive feedback (adapted from [73])

This creates a balancing problem for designing new technology as customers might avoid technologies with a high perceived switching costs.

2.6 Dominant Design

Sections 2.3 and 2.4 describe the choice of product or technology for the user. However, as there are a limited amount of users available, a competing technology or product will lose their users. This has been described as positive feedback[73], which is illustrated in Figure 2.4.

A critical mass of users can trigger an innovation to win, and also result in discontinuance of the losing innovation[70]. The winning innovation is called the dominant design[5]. Dominant designs traditionally make the competitors withdraw their alternatives from the market and concentrate on the dominant one and have very large collective switching costs.

The WWW has made dominant designs less important, as it allows even the smallest entrants to come up with clever new service innovations at least in niche markets. This phenomenon is described by Anderson as *the Long Tail*[4].

2.7 Compatibility

In networked goods, compatibility describes the interconnection possibilities between the products of competitors. The introduction of compatibility in a product creates competitive effects and network effects. Competitive effects are the decrease of profits due to the increase of competitors and network effects are the increase of profits due to the network externalities from a larger user base.

Economides has argued that if the products have strong network externalities, the network effects are larger than competitive effects resulting in higher profits and thus compatibility and interworking between companies should be encouraged[24]. According to Shapiro and Varian, compatibility shouldn't be used if the company is able to capture a critical mass of users by itself[73]. In networked goods it is difficult to achieve, though. Alliances between companies are one way to limit the compatibility while enabling a larger user base than one company would be able to capture alone.

2.8 Service Structures

According to Gaynor, the structure of a service can be generalized as centralized or distributed[36]. Centralized services contain a single point of management, which allows for tight control but are not very flexible nor encourage experimentation. The changes are regulated by the single authority and the service is designed to suit a wide audience, possibly introducing compromises. These services are also prone to denial of service attacks which are common in today's Internet.

Distributed services have several management points, and feature interconnection between them. This encourages experimentation and the services can be customized better for the needs of users. This structure consumes more resources, though, as the efficiency is much lower than with a single management point.

The choice of service structure is related to the market uncertainty (see Section 2.2). If the uncertainty is high, there is a need for experimentation to see which kind of a service is adopted by the users. In this situation the users will choose a service with a distributed management structure. On the other hand, if the uncertainty is low and the needs of users are well known, the need for experimentation is also low. Then the users will value the efficiency of a centralized management structure over the possibilities of experimentation.

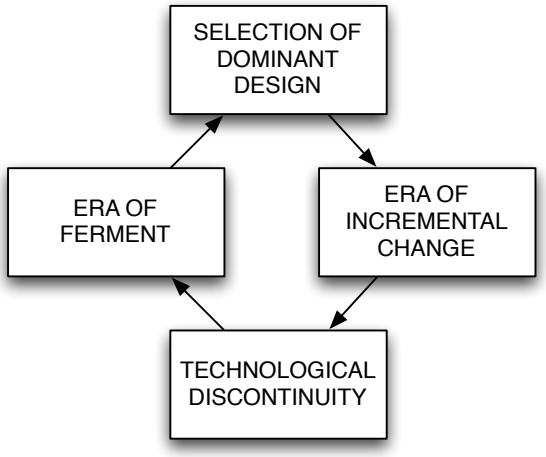

Figure 2.5: Technology cycle (adapted from [5])

As the uncertainty can change over time, the design of a service should take both centralized and distributed structures into account.

2.9 Technology Cycles

Anderson and Tushman described the technological evolution to be cyclical. The cycle starts with a technological discontinuity and continue with an era of ferment, choosing a dominant design, an era of incremental change and end when another technological discontinuity appears[5]. A discontinuous innovation can be described as a dramatic advance in the price/performance ratio in the industry which an ability to even destroy the incumbent companies' market positions. Afterwards, in the era of ferment, competitors implement their alternatives into the technology area, one of which is selected as the dominant design. The dominant design will incrementally improve until another discontinuous innovation appears. The cycle is illustrated in Figure 2.5.

2.9.1 Case E-Mail

A technology cycle can be seen with e-mail during the 80's and 90's with e-mail[36]. First, standard technologies like X.400 and Internet e-mail (SMTP)

competed with each other and with service provider proprietary e-mail systems, indicating high market uncertainty. Then, the market uncertainty lowered as SMTP became the dominant design due to its simplicity to the end users and binary file transfer capabilities. Afterwards, e-mail services such as Hotmail and Internet service providers competed for customers. This stage could be described as a mixture of eras of fermentation and incremental change. An e-mail address has a relatively large switching cost, which creates need for a separate address unrelated to the actual Internet service such as a Hotmail address. When the services providing a separate e-mail address gained popularity, e-mail shifted more into a centralized management structure.

However, during the technology selection stage gateway services between the competing technologies were also built, such as between X.400 and SMTP which were open standards[83]. Different X.400 systems were not always interconnectable, but gateways were built between the systems as well. These gateways made e-mail more valuable to users regardless of their primary e-mail system. E-mail addresses have similar concepts where a permanent address can be forwarded to an user changeable address.

2.10 Mobile Business

There are many players in a mobile business model. A traditional business model consists of a customer and a service provider, but mobility brings in also regulators, network operators, content providers, internet service providers and payment agents. It is argued that a business model needs to be profitable for all of the players for it to succeed[19], but as we can see, there has been success with nonprofitable business models too.

2.10.1 Walled and Open Garden

Walled garden means that the primary service provider is in control of what the end user can do[36]. In the mobile context, the primary service provider is the mobile network operator (MNO). The operator controls the applications available to the end user, by restricting the connection possibilities to the user. The applications can be developed by the operator itself or by trusted third parties. The operator can restrict even the selection of the mobile phone.

In contrast, an open garden means that the user can choose the applications

and technologies freely. A complete open garden might not be realized in the mobile context, as the telecommunications business is regulated and needs to be interoperable.

2.10.2 Revenue Models

Traditional mobile business models rely on a walled garden model, where an end user uses calling and sending text messages, which generate per-minute and per-message revenue to the MNO. As more and more phones and mobile networks have become Internet and WWW-enabled, data transfer has risen to a third primary function which opens up the walled garden. A traditional model[28] assumes an usage-sensitive pricing for data transfer and revenue sharing between the content service provider and the MNO. In standard Internet use, data transfer amounts can vary a lot due to rich video and image content, which creates interest towards a flat-rate pricing model from the end users. Recently flat-rate pricing has become available, and the amount of data transfer has grown exponentially due to it[61]. This tends to force the network operators to adopt a *bit-pipe* model, which they function only as data transfer agents without any revenue sharing from the actual content and service providers. The operator can get revenue by being involved in the service, by for instance providing an easier access to it and provide billing functionality[51, 75].

Roaming costs have still been very high regarding data transfer, lowering the usefulness of flat-rate pricing for customers. On the other hand, roaming has been very profitable for the operators. In the EU, regulation has been placed to cut roaming data transfer costs heavily from July 2009 onwards[27].

Advertising

is one possible way to generate revenue for the service. Social media services usually gather a lot of personal information regarding each user, which enables personalized advertisements. Mobile phones are regarded as personal devices which are most of the time with the user, thus creating an ideal target for advertising if the advertisements are highly informative or entertaining[11]. However, in the social media context, research by IDC has shown that pay-per-click advertising is not as effective as in standard WWW[45, 37]. Such advertising is also not very effective for mobile applications, as the small screen size and usage situations pose limits to the advertisements[69].

A more efficient way could be using coupons. Coupons offer rewards if used, like special discounts. The coupons can use different forms, like text messages or images stored on the phone's memory. Text message coupons have been somewhat successful[67]. A new method for mobile coupons has also been discussed. For instance, the mobile coupon could have *stamps* based on coffee purchase events. After gathering enough stamps, the user would get a free cup of coffee. Social media enables interesting new viral marketing methods for coupon use. Sharing a coupon with the user's contact list, ranking coupons by popularity and giving gifts to other contacts via mobile coupons are possible, opening up business opportunities. Some problems regarding to mobile coupons exist in redeeming them. Near Field Communications (NFC) is anticipated to bring some relief to the mobile equipment problems[2], but the Point-Of-Sale (POS) equipment needs to be updated as well. Research indicates that NFC technology will not be generally available until after 2010[33].

Subscription-Based

Subscription-based premium service with free standard service model, i.e., the *freemium* business model, is suitable for social network services[37]. If the premium mobile service offers real value to the end user, it could be worth subscribing to. A combination of subscription and advertisements has also been proposed[93].

No Business Model

No business model is also an alternative. With social network services, the amount of users can be seen as value for the service due to network externalities. One way is to assume that when the user base has grown enough, some other company with a better business model will buy the service. This happened to Jaiku, which was bought by Google in October 2007[26] and Dodgeball, which was also bought by Google in May 2005[40]. Finally in January 2009, both services were closed[39], probably due to the lack of a viable business model and added value to Google. This suggests that unless a social media service provides real value to a prospect parent company, this business model will not work. In niche markets, mobile social media services with no business model can be used as promotional tools[20], though the potential amount of users and network externalities are small.

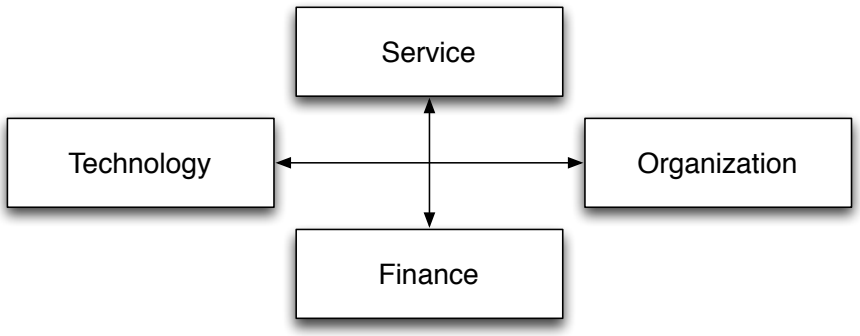

Figure 2.6: STOF (adapted from [14])

2.10.3 Open Interfaces

As the industry moves towards IP-based communications where mobile network operators are threatened to become bit-pipes, new open garden based service concepts have been proposed[53]. In these concepts, the operators open their service interfaces to application developers. The network operators have positioning and presence information as well as SMS messaging and call control natively, which has been unavailable to third parties before. Third parties could also benefit from the operators' existing billing features. Standard interfaces, such as Parlay-X, have been proposed but the interfaces have not been adopted widely as of May 2009.

2.11 STOF

STOF, which stands for Service, Technology, Organization and Finance, is a business model analysis and development framework for mobile services developed by Harry Bouwman, Henny De Vos and Timber Haaker[14]. The STOF layout is illustrated in Figure 2.6.

The four STOF domains each describe significant aspects related to the business viability of a mobile service.

2.11.1 Service

The service domain describes the value proposition of using the service to the end user. The value can be described with many ways depending on the

context.

Intended Value

Intended value is the basis for service design that the service provider wishes to offer to the end users using the primary use case. It often is different than the rest of the value descriptions, though.

Delivered Value

Delivered value is what the end users could actually receive. Service functionality and distribution affects the differences between intended and delivered value.

Expected Value

Expected value varies according to end users' individual experiences with previous versions or similar services. Also, the end users base their value expectations on their overall image of the service provider and usage costs.

Perceived Value

Perceived value is the ultimate value an end user receives from using the service. It is affected by the service's usage scenarios, ease of use and emotional issues.

2.11.2 Technology

The intended value defines technological requirements for the service. The technology domain describes the architecture designed for filling the requirements, as well as devices and applications used by the end user.

2.11.3 Organization

The organization domain describes the different players related to the service. Typically in a mobile service, the amount of players is higher than normally. The players combined with their relationship with the service form a value

network. Relationships between the players can be on multiple levels, forming complexity and interdepence into to the value network.

2.11.4 Finance

The financial domain contains the most important aspects of a successful mobile service. A viable revenue model is critical, but also costs and risks have to be considered. If the revenue sources are the users, different pricing models are also to be considered.

Chapter 3

Mobile Technology

Mobile technology has developed during the recent years to incorporate more features into less expensive equipment. This chapter describes technology aspects related to mobile service development.

3.1 Features

Compared to standard desktop computers, mobile devices are most of the time with the user, providing connectivity and access to services anywhere and at any time[19]. Smartphones are generally described as mobile phones with advanced features such as user installable applications and Internet connectivity, as well as features not present in desktop computers or laptops[77]. Picture and video capturing features are now very common and present in most mobile phones. GPS and other locationing features are present in the higher-end mobile phones as of May 2009, but research predicts that GPS location-awareness is becoming more and more common[1], which creates possibilities for accurate location-based services. Also, there are predictions that the amount of smartphones will rise from 13% in 2008 to 23% in 2013, totalling sales of 300 million smartphones per year[48].

3.2 Platforms

The general problem in implementing new services to mobile devices is that there are many very different devices, which use different platforms. A general platform, mobile WWW, is adequate for some basic use but is very

limited due to the phones' different WWW browser implementations. New standard (non-smartphones) phones usually feature some kind of a Java Micro Edition environment for running custom applications. Smartphones usually feature a more flexible platform for running native code. Research has been conducted for analyzing different application environments on various platforms[13]. According to Gartner's report for 1st quarter 2009 smartphone sales[35], Symbian was in the lead, followed by Research In Motion (Blackberry phones) and with Apple iPhone third gaining more market share very quickly. The market shares are constantly changing according to trends and also vary regionally. According to Gartner, Nokia using Symbian is the market leader in Europe, Middle East and Africa while Research in Motion and Apple have the leading positions in North America[34]. Application development has to be balanced between platform coverage and development costs, depending on the target geographical regions.

3.2.1 Mobile WWW

Almost every mobile phone these days comes with a native WWW browser adapted for mobile use. Their functionality is usually limited and support for modern Rich Internet Application technologies such as AJAX still vary much as well as slowing down browsing[68]. There are third party WWW browsers available too for mobile platforms, which can provide more advanced functionality. Opera Mini, based on Java ME, renders some content on Opera's proxy servers, compresses it and transfers it to to the client[65]. Opera Mini provides efficient web browsing for most phones that do not have a full-featured native browser. It doesn't handle AJAX, though. Skyfire is a radically different mobile browser. It renders all of the content with Windows-based browsers on their servers, which is then transferred compressed to the mobile client[78], effectively unloading the processing burden from the phone. It claims to provide full AJAX, Flash, Silverlight and Quicktime compatibility, but the platforms supported are quite rare as of yet. The Skyfire system is very resource intensive on the server side, which will require either advertisements or a subscription for the users in the future.

The World Wide Web Consortium has issued a recommendation Best Practices document for Mobile Web[89]. This takes different devices into account, and serves as a design guide for using Mobile WWW as a platform. Mobile WWW provides wide mobile phone support, but doesn't allow any other mobile specific features for the time being than sending picture files on some mobile browsers and social media services. It also makes the server carry most of the processing burden, which compared to shifting load to mobile

phones is more expensive when scaled up to more users. Most of the content needs to be reloaded and processed continuously while using the service, thus slowing the user experience[71] compared to a more native platform where the most of the data relies already in the phone and only updated content is transferred via a data connection. Taking these hindrances into account makes today's mobile WWW an unlikely platform for a *killer app* social media service but instead a reduced functionality version of a desktop WWW social media service.

However, it is predicted that the distinction between mobile WWW and desktop WWW will be blurred due to the immense amount of mobile devices capable of browsing the Web[86]. There are industry initiatives to provide JavaScript access to mobile specific features and running the mobile WWW application outside a browser environment and without a network connection[3]. These applications are called widgets, and are estimated to gain popularity very soon[68]. Also, technologies such as HTML 5 will bring more features for standard desktop WWW to be viewed in mobile devices[49].

3.2.2 Java 2 ME

The Java 2 Platform, Micro Edition (J2ME) is a somewhat device-independent platform for mobile phone applications. The phone runs a device-specific Java Virtual Machine interpreting Java into native code. J2ME includes Mobile Information Device Profiles (MIDP) which contains common features that all J2ME compatible devices for that profile must support, such as network connectivity and scalable user interfaces that provide device and resolution independent programming for applications[84].

Also, there are optional features described by more Java Specification Requests (JSRs) that the devices can support, such as location awareness (JSR 179 and JSR 293)[10], image and video capture (JSR 135) with additional camera control (JSR 234). These with additional other features combine into a Mobile Service Architecture (MSA) umbrella[84], which enables all the features needed for a state-of-the-art social media application.

The problem with J2ME as with Mobile WWW is that the implementations are sometimes different than the specifications, and it is usually hard to update a mobile phone with more features without buying a new one. JSR 271, or MIDP 3.0, is a future profile aimed at providing J2ME with more features such as running in the background or automatically starting up applications on device startup[47]. Also, it tightens specifications to attempt bringing more compatibility between the implementations. However, not all

platforms support J2ME, such as Apple iPhone or Windows Mobile.

3.2.3 Symbian Series 60

Symbian S60 is a mobile software platform running the Symbian operating system. It is owned by Nokia, which also manufactures most of the S60 phones. It supports user installable applications that are programmed in native C++, resulting in efficient use of the processors and access to low- and high-level hardware functions such as phonebook, camera, positioning and wireless networking[82]. The applications can be left running in the background. S60 applications have to be signed by Symbian in order to utilize the full feature set available, but can be distributed freely.

3.2.4 Apple iPhone

Apple's iPhone is a closed platform launched in 2007, running a modified version of Mac OS X. The SDK includes many hardware features to be used in the applications, such as camera, positioning and multi-touch controls, though the applications cannot be left running in background[7]. This limits always-on social media service features. Apple is using currently a walled garden model, in which users cannot install any application they wish but instead are limited to Apple's App Store. Application developers must distribute their applications through it, and Apple can limit available applications as they wish.

3.2.5 Google Android

Google Android has been released as open source mobile phone platform. Many device manufacturers have announced phones using the platform, including Sony Ericsson, HTC, Motorola and Samsung. Applications for Android phones can be developed with Java, using the freely available Android SDK. As the platform is open, hardware configurations can vary widely. The SDK support includes cameras, positioning and phonebook functionality[38]. Also, applications can be left running in the background.

3.2.6 Windows Mobile

Windows Mobile is Microsoft's mobile platform, derived from Microsoft Pocket PC used in touchscreen PDAs. Manufacturers that use Windows Mobile include HTC, Sony Ericsson and LG. It features a similar user interface and applications as Microsoft Windows and flexible syncing with Microsoft's corporate products. Applications can be developed using Visual C++ with Microsoft Visual Studio on the .NET Compact framework, and can feature positioning and camera functions. The applications can be distributed freely to the end users.

3.2.7 BlackBerry OS

BlackBerry OS, developed by Research In Motion (RIM), is used in BlackBerry phones. Applications can be developed using standard J2ME, but there are certain BlackBerry-only classes that enable usage of the specific hardware features such as camera, positioning and contacts database. Applications can be left running in the background. Code signing is required to access certain features, but development is mostly free from restrictions.

3.2.8 Palm webOS

Palm webOS, announced in January 2009, is a mobile phone operating system based on Web technologies. Developers will be able to create applications for the operating system using only HTML5, CSS and JavaScript[66]. Native features, such as positioning, are available through a local JSON based service.

3.3 Software Installation

The most critical part of successful adoption of a new mobile service is the installation[88]. If the user is not able to install the service on the mobile phone, it will not be used at all. Different platforms have different mechanisms for the installation. Mobile WWW based services usually require no installation at all, requiring the user only to save a bookmark in the mobile phone's browser pointing to the service. This procedure is familiar from standard desktop WWW browsing, but typing the address with a keypad might limit the potential users. J2ME based services require installation,

which is usually done via the mobile WWW browser. It requires typing the address manually into the browser like with mobile WWW based services and confirming the installation of the application.

The installation of native applications has been more complex, though. Sometimes installing an application requires installing special software on a computer and connecting the phone to the computer, which can be a significant barrier towards the service adoption. Phone manufacturers have recently launched special application distribution services to encourage users to install new applications. Apple's App Store was the first, and due to its very easy and intuitive user interface, it has been very successful with over a billion application downloads in nine months[8]. App Store provides applications that are either free or commercial, with 70% of the revenues going to developers. This promotes application development.

Other platforms have since followed with their services. Nokia has announced Ovi Store to become the application distribution platform for Nokia's phones, including those based on Symbian S60[59]. Google's Android platform features Android Market, which is similar to Apple's App Store. Microsoft has followed with Windows Marketplace for Mobile for their Windows Mobile platform. BlackBerry features the BlackBerry App World, and Palm has announced App Catalog to be used in the Palm Pre platform.

Chapter 4

Social Media Services

Social media services are services that incorporate communication between other users and usually feature user created content such as multimedia, position data or textual data. Boyd distinguishes *social media* and *social networking* by not having user created content in social networking services[17]. Social networking services and social media services are nowadays usually used interchangeably, but in this study the latter is chosen. Typically, users have a list of contacts, or friends, that they communicate with. These contacts form a social network, and groups within the network are commonly formed. Due to network externalities, the value of a social media service to its user grows according to the amount of other users he or she can connect to[37, 9], see also Section 2.4. The lack of other users in the network slows down the rate of service adoption[70]. Also, as seen in Section 2.3.4, perceived complexity is one of the key reasons for slow adoption of new technology[70]. Application distribution, installation and usage must be simple also to non-technical persons.

Most users have already an off-line relationship with their contacts, making the social media service an alternative way to connect with them[17]. Research indicates that there is a connection between the number of social media service contacts and off-line contacts[87], which means that socially active people tend to have a high number of social media contacts too. The amount of contacts can be seen also as an indicator of popularity as well as physical and social attractiveness. It is seemed impolite not to accept an incoming request for becoming a contact, though, which could artificially make the contact numbers higher than they should be. Having a large number of contacts can also have a negative impact, when the number exceeds a reasonable amount of possible off-line contacts.

Using a social media service can also be trend, creating pressure for users to join the service if their friends use it. This has been observed especially among teenagers[16]. They use the social media service mostly to maintain their existing connections, while older people use the services to also make new contacts. Young adults use social media services to create social ties with people they just barely know, and maintain lightweight connections with a large group of acquaintances[81].

The popularity of services varies regionally. Some social media services are specifically made for specific countries or geographical areas, while some are global. Users tend to select only one or two generic social media services with the rest being more targeted services [46]. This indicates high switching costs between social media services. The lock-in is natural; if the user's off-line contacts are already using a certain service, the usefulness of another service with less contacts is limited.

4.1 Open Architectures

It is also possible to establish connections to other services through established technologies to increase the amount of users that can be reached and provide more value to the end user through network externalities (see Section 2.7), but many service providers are not very keen to open up their borders as they might lose their source of revenue[90]. Historically, gateways facilitating communication between the competing technologies have been implemented, such as with e-mail (see Section 2.6). Openness can cause privacy and security issues, though, if sensitive user data is opened up to other parties[32].

4.1.1 OpenSocial

OpenSocial, as the name suggests, is an open platform for social media services. It is being maintained by the OpenSocial Foundation, including representatives from Google, MySpace, Yahoo!, hi5 and Flixster. The OpenSocial API enables social data from certain existing social media services to be used in third party applications[42]. OpenSocial abstracts the user social data from the actual service hosting it by making them OpenSocial containers. The data can then be accessed from any other service using the open API.

Current services using OpenSocial and thus being OpenSocial containers in-

clude MySpace, LinkedIn, orkut, Friendster, Yahoo!, hi5, Google Friend Connect and many others.

Google Friend Connect

Google Friend Connect is Google's primary OpenSocial container, and a simple way to incorporate social media features into existing web sites[41]. Developers can use a JavaScript API to access user profile, contact network and activity functionality with gadgets provided by Google. There are also more advanced APIs for more functionality.

4.1.2 Facebook Connect

Facebook Connect is Facebook's API for third party applications. It allows users to connect the application with Facebook in order to access Facebook's data for the user[31]. The application can publish stories into the user's Facebook profile or show Facebook data in the application.

Facebook Connect is not very open. The applications must first register with Facebook to get an authorization key. The policies are very strict, and any data received from Facebook must be deleted upon an user's disconnection from the service[29]. Compared to OpenSocial, Facebook Connect is much more restricted and can be described as a walled garden.

4.1.3 Federated Identities

Federated identity management refers to a technology concept in which the identity and trust information is distributed across separate entities. The most visible feature enabled by it is single sign-on (SSO), where a login to a single system provides access to a number of services. Components for federated identities include the end user, actual service provider and an identity provider to which user authentication is delegated. A single sign-on process is illustrated in Figure 4.1. The identity provider can provide and store additional information as well, such as profile and contacts data. However, federated identity management also raises security issues, as private data is distributed across security domains[50]. All parties involved should be protected against attacks compared to the single closed system. Also, the possibilities of abusing a stolen identity are leveraged from the number of services connected.

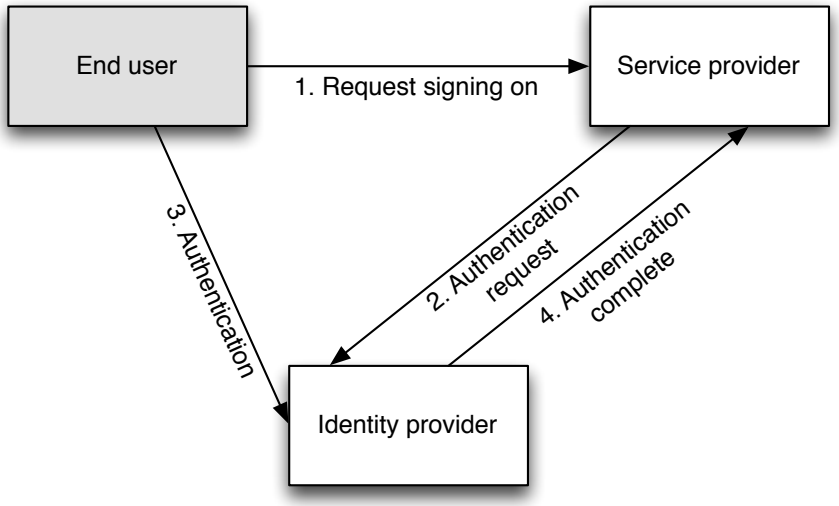

Figure 4.1: A single sign-on process

OpenID

OpenID is a standard for identity federation. Compared to a single identity provider model, OpenID allows for any number of OpenID providers. The service provider is called a relying party[64]. The system is very independent and distributed, and there is no central trust mechanism for OpenID providers. Scalability on the other hand is excellent, and thousands of services already accept OpenID authentication.

4.2 Privacy

Social media services have also created a number of privacy issues. Publicity of the user's profile data can be potentially dangerous if criminals find a way to abuse it. On the other hand, by not making the profile information public, the user makes it more difficult for other potential contacts to find them. Different services have different default publicity settings and abilities to customize them, but most users do not realize the consequences of publicity of their private information[43].

As the importance of social media services grow in daily communication, the possibility of identity theft increases. Most services do not have a way of identifying that the user creating a profile actually is the same person in real

life. The stolen identity can then used to access other users' private data[12].

Also, an user can have several distinct groups of contacts, which do not necessarily share the same interests. For example, the user might not want to share the same information with friends from school than with the user's parents or other relatives. This is problematic especially for young people, whose parents want to follow what they are doing by using the service[16].

Chapter 5

Scenario Construction

Mobile social media services have a high degree of uncertainty in technology, business models and demand. This calls for scenario analysis, which is suitable for analyzing possible future outcomes[19, 15].

Shapiro and Varian have formulated two dimensions for network strategies: Compatibility vs. Performance and Control vs. Openness[73]. In this study, the dimensions are adapted for mobile social media applications as Closed vs. Open and Desktop vs. Mobile.

Closed vs. Open considers the openness of the service. As described in Section 2.4, the more users a service can reach, the more valuable it is to the end user. Open services are connected to others, maximizing the potential number of users. Closed services only allow its users to connect with other users in the service.

Desktop vs. Mobile considers the technological design basis for the service. Desktop services are designed primarily for usage within a desktop PC environment, where mobile services are designed taking mobile specific features and restrictions into account.

5.1 Scenarios

These dimensions combine to form four scenarios for a new mobile social media service: desktop WWW to mobile, straight to mobile, aggregated WWW to mobile and aggregated straight to mobile, which is illustrated in Figure 5.1.

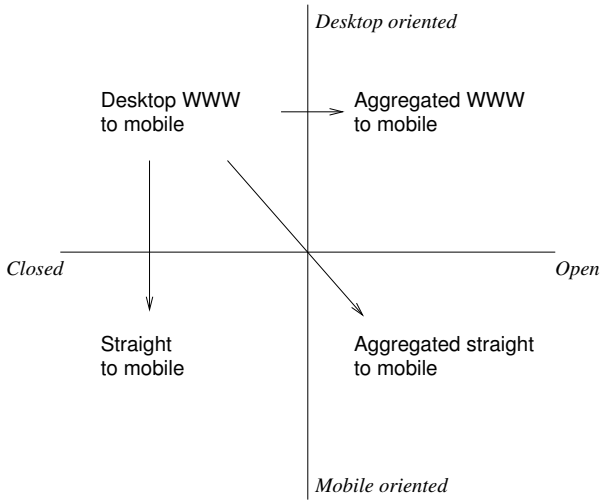

Figure 5.1: Scenario dimensions

5.1.1 Desktop WWW to Mobile

Desktop WWW to mobile means that the mobile service is based on an existing social media service primarily targeted towards desktop WWW users. The mobile service is provided as a convenience to the regular service users for access to the features on the move. This scenario is illustrated in Figure 5.2.

5.1.2 Straight to Mobile

Straight to mobile services do not bear the hindrances of legacy desktop WWW social media services and are instead free to implement the service from a fresh new perspective using all the features available to mobile devices. Positioning and media capturing is used to provide actual added value to the end user. This scenario is illustrated in Figure 5.3.

5.1.3 Aggregated WWW to Mobile

Aggregated WWW to mobile services integrate many existing desktop WWW social media services into one, simple to use mobile service. Aggregation acts as a gateway between the services (see Section 2.9.1). Functionality is limited, but added value is provided through the simplification of having the

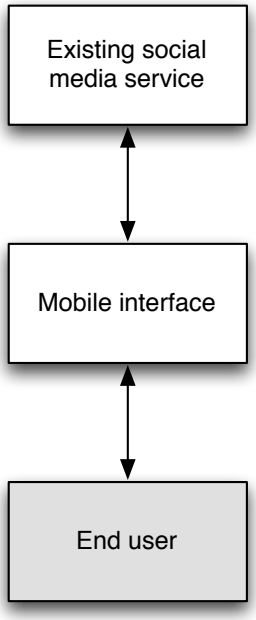

Figure 5.2: Desktop WWW to mobile

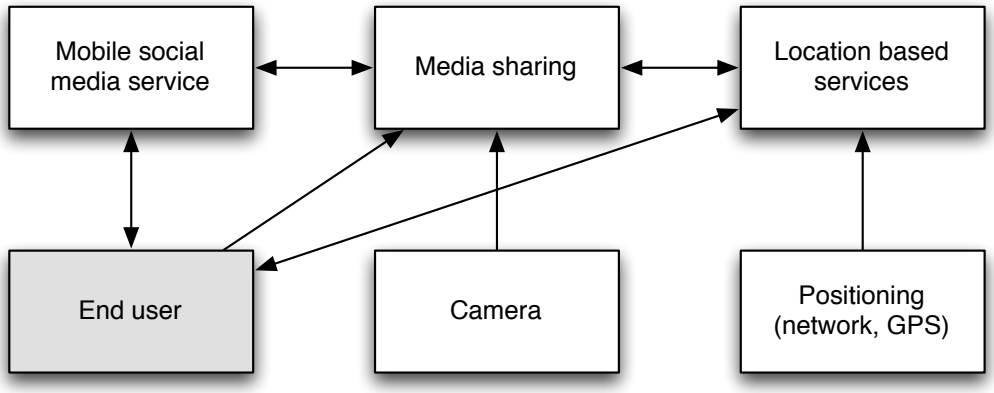

Figure 5.3: Straight to mobile

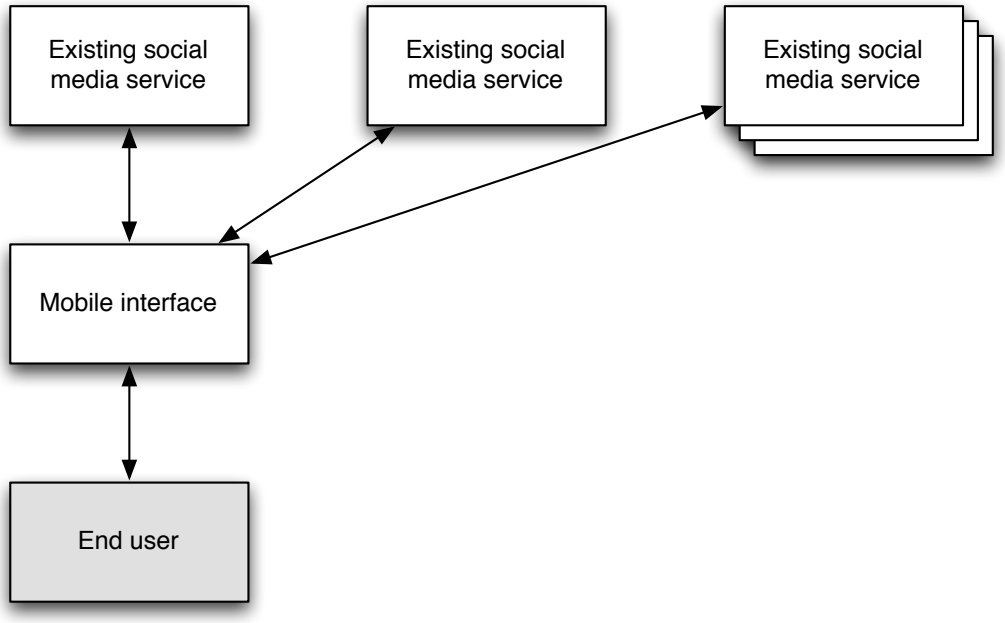

Figure 5.4: Aggregated WWW to mobile

maximum amount of contacts available for messaging on a single screen. This scenario is illustrated in Figure 5.4.

5.1.4 Aggregated Straight to Mobile

combines the unique features of straight to mobile services and the contacts integration of aggregated WWW to mobile services. The combination has the best aspects of all other categories but is also technically and financially challenging. This scenario is illustrated in Figure 5.5.

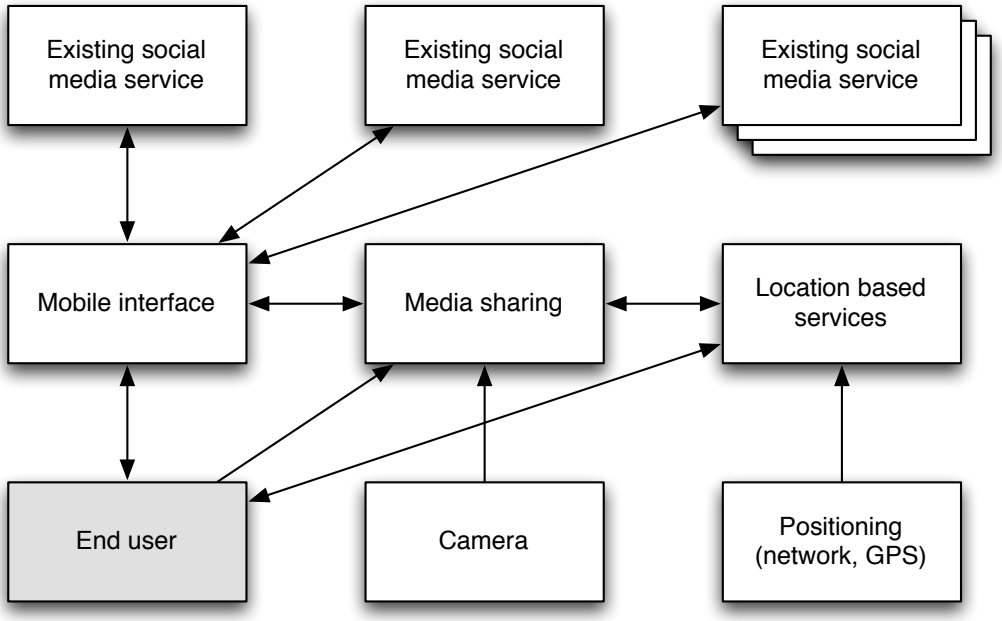

Figure 5.5: Aggregated straight to mobile

Chapter 6

Case Study

In this study, a multiple case study is used to compare *state-of-the-art* services and to identify their strengths and weaknesses using a common framework[92]. Additionally, the best practices are combined into a description of a possible future service.

6.1 Case Study Framework

Based on the previous chapters, a framework is created for comparing mobile social media services. The framework uses STOF (see Section 2.11) as the basis, but includes also user base and complexity to compare the attractiveness to potential new users. The framework is illustrated in Figure 6.1.

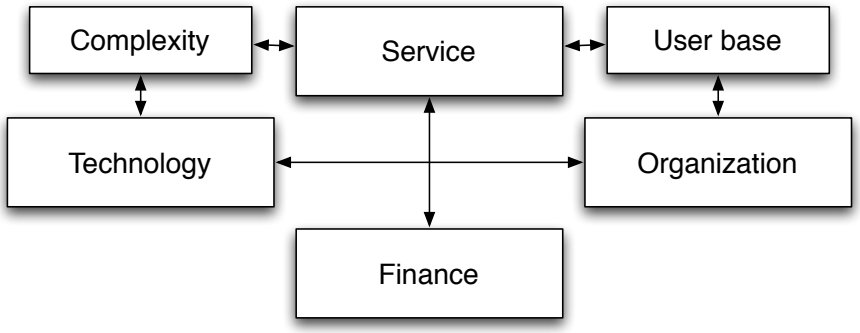

Figure 6.1: The case study framework

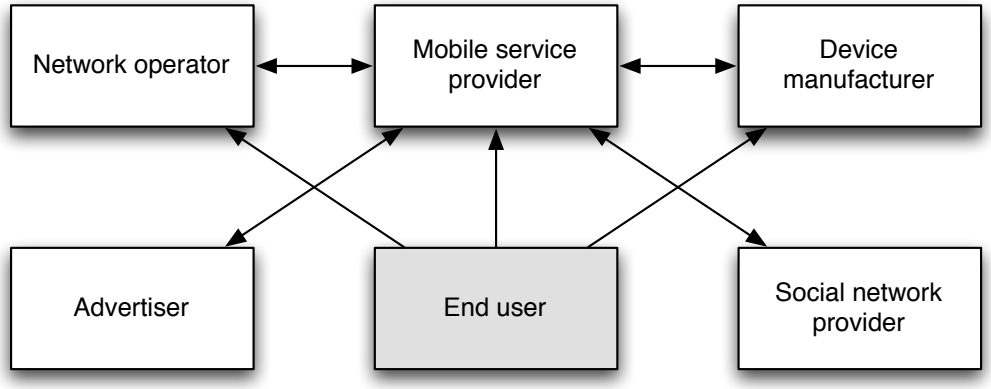

Figure 6.2: A complete value network for a mobile social media service

6.1.1 Service

The service element is used to compare the features valuable to the user especially in the mobile context.

6.1.2 Technology

Technology contains the technical elements used, including mobile specific features such as media capture and positioning. Also, the technology part includes platform coverage, see Section 3.2.

6.1.3 Organization

Organization compares the players involved in the service and the value network. A complete value network for mobile social media services is illustrated in Figure 6.2.

6.1.4 Finance

The finance element is used to compare the business potential and revenue models of the services for long-term survival. As noted in Section 2.10, there are few viable mobile revenue models.

6.1.5 User Base

User base is used for comparing attractiveness for potential new users, as the value depends on the amount of other users, see section 2.4. This includes any current users as well as possibilities to connect to third party services to maximize the connectible user base, see Section 4.1. Most revenue models also depend on the amount of users.

6.1.6 Complexity

As shown in Section 2.3.4, difficulty in installing and using the service can be a major obstacle in technology diffusion. Complexity is thus a critical element in a new mobile service. As there are no objective measurements for complexity, the comparison is always subjective. In this study the comparison is attempted to be as objective as possible.

6.2 Case Selection

Using the dimensions in Section 5, notable existing mobile social media services are visualized in Figure 6.3.

Five cases representing different backgrounds are selected for the case study. The cases form a wide coverage on the current state-of-the-art: Nokia as a phone manufacturer shifting its focus to service business, Facebook Mobile as the mobile extension to the most popular desktop WWW social media service, ShoZu as a service utilizing many mobile-specific features, Yahoo OneConnect as an integrator of many existing traditional social media services and OtaSizzle as an open research platform.

6.3 Nokia

Nokia, the biggest mobile phone manufacturer in the world in 2008 has recently been adding services into its product portfolio. Nokia's strategy seems to be gaining more positions in the mobile business playground (see Section 2.10). As a phone manufacturer, Nokia can integrate services and applications tighter into the handset than third parties. This leads to a better position when trying to capture market share.

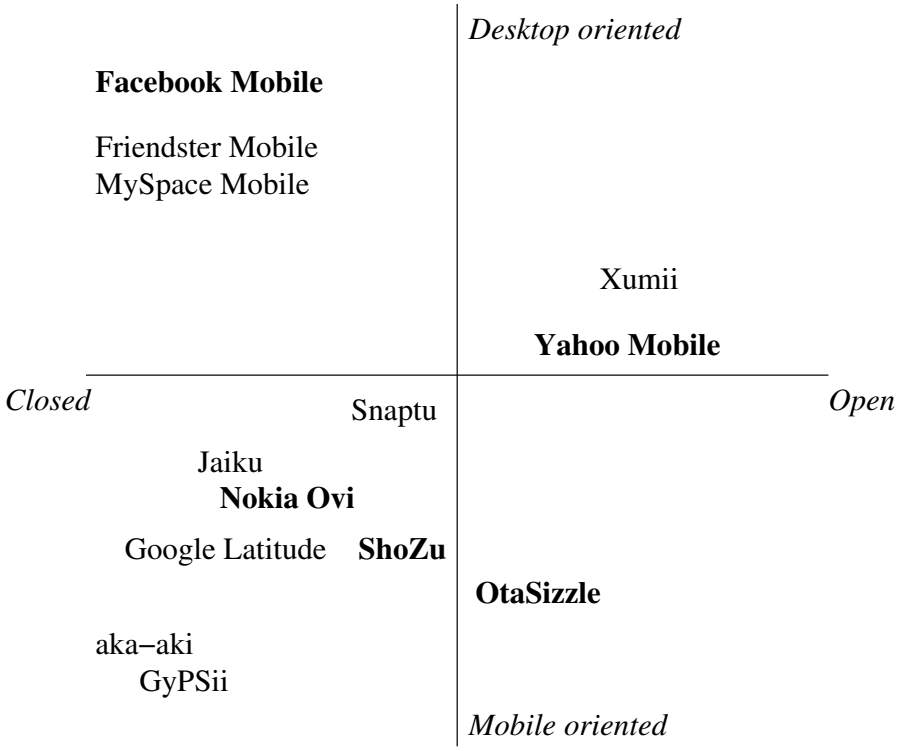

Figure 6.3: Notable current mobile social media services categorized

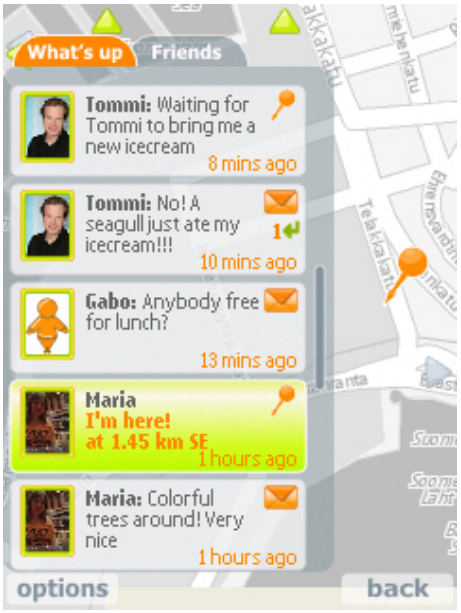

Figure 6.4: Nokia Friend View (source: Nokia)

In December 2008, Nokia's CEO Olli-Pekka Kallasvuo launched the term *Solo*, Social Location, which refers to location-based services in the social media context[55]. Nokia's Capital Markets Day presentation included references to new social network services[56]. This can be interpreted that Nokia is keen on capturing market share in the social media business.

Nokia's current main service offering includes Ovi, which is a suite of mobile applications which are extended into desktop WWW as well. As of May 2009, Ovi includes two social media applications: Share Online[60] and Ovi Contacts[58]. Share Online allows users to send pictures directly from their mobile phones to Ovi where they can be shared with other users. Ovi Contacts is a social media service integrated into the phone's phonebook, and is described as part of the case study.

Additionally, Nokia has a Beta Labs location-based social media application called Friend View[57]. Friend View consists of global map data downloaded from Internet, user profiles specific to Friend View as well as microblogging features for each user. For instance, one user can create friend lists to which they will publish status updates and optionally location updates as well. The user's location is based on either manual update by scrolling the map to a specific location, by internal or external GPS or by network cell ID location. A screenshot is featured in Figure 6.4. Friend View is not an application in

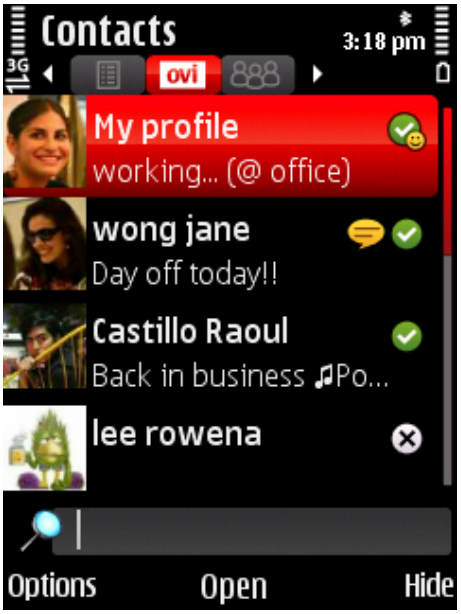

Figure 6.5: Ovi Contacts running on Symbian S60 (source: Nokia)

production use, so it will not be featured in the case study.

6.3.1 Service

Ovi Contacts allows the user to see their friends' status updates and locations on a map like Friend View, but additionally provides chatting, presence and *Now playing* features. A screenshot is shown in Figure 6.5. The presence notifications such as being busy or on the phone depend on tight integration with hardware, so Nokia has natural advantages in developing these services.

6.3.2 Technology

Ovi Contacts has a wide Nokia platform support, such as S40, S60 3rd Edition and Maemo. As such, it can be expected that Contacts on Ovi will be integrated to all new Nokia phones. The support for S40, which is used on less expensive Nokia phones, will bring the service available to a much larger customer base that does not use or require smartphones. On the other hand, it is not provided for any others than Nokia phones, which limits the potential user base drastically. Mobile specific features are used for positioning, and the user interface is adapted to mobile use very well.

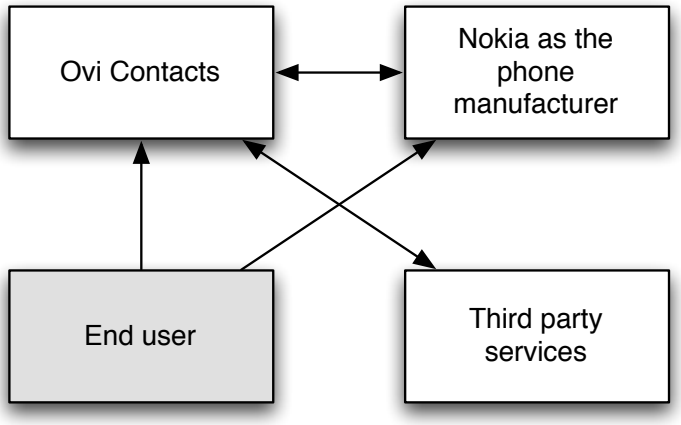

Figure 6.6: The value network for Ovi Contacts

6.3.3 Organization

The value network for Ovi Contacts is fairly limited, as it is a service provided by the phone manufacturer. Connections to third party XMPP based instant messaging services, such as Jabber and Google Talk, are possible. The value network is illustrated in Figure 6.6.

6.3.4 Finance

The financial domain is very simple, as Ovi Contacts is financed entirely by Nokia as a phone manufacturer. In return, Ovi Contacts provides added value to the phones and could make them more attractive to customers choosing between phones. The revenue model is viable in that sense.

6.3.5 User Base

The Ovi suite applications share a common user base, which is very small at the moment, although no figures have been published. As the Ovi applications can be used only with Nokia's phones, the global potential user base is comparatively limited. Connections to third party XMPP based instant messaging services with tens of millions of users are available, but they are limited to chatting and do not provide location information.

6.3.6 Complexity

Ovi Contacts features a novel user interface, as it is partly integrated into the phonebook. The phonebook is an intuitive and already familiar interface, which makes the service relatively easy to use. Installation of the application is still complex, but as Nokia plans to preinstall it to many new phone models, installation will not be needed in the future. Signing up is required, though, and finding friends can be difficult when using the phone interface.

6.4 Facebook Mobile

Facebook Mobile is the mobile extension to Facebook, one of the largest social media services in Internet. MySpace, the other big player, has a very similar MySpace Mobile service available and was left out from this case study.

6.4.1 Service

Facebook Mobile allows users to access some of Facebook's content with a simplified interface adapted for mobile phones. It has a wide range of features, including profiles, messaging, wall posts, status updates and comments as well as small photo galleries. Notable features missing from the desktop WWW service are Facebook chat and most third party applications. Facebook Mobile does not support any positioning features, though, and photo sending is limited to the iPhone and BlackBerry native clients. A screenshot of Facebook Mobile running on Symbian S60 is shown in Figure 6.7.

6.4.2 Technology

Facebook Mobile's platform support is quite wide, with native clients for iPhone and BlackBerry phones. Other phones can use a limited feature set with a mobile WWW user interface. Facebook has a somewhat open connection interface for third parties as well. One example is Sony Ericsson's Xperia X1 mobile phone, which features a Facebook panel[80]. The panel features a hardware accelerated fluid graphical user interface to Facebook's primary features.

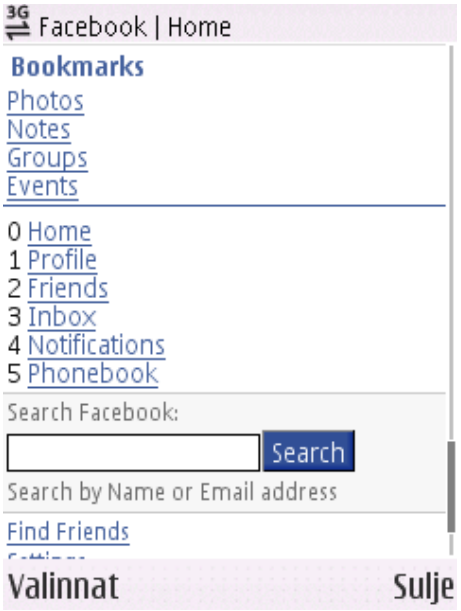

Figure 6.7: Facebook Mobile running on Symbian S60 (source: self taken)

6.4.3 Organization

Facebook Mobile has a closed value network primarily between the end user and the actual service. Additionally, Facebook Mobile has some connections to phone manufacturers, for example Sony Ericsson, who have built-in client applications. However, Facebook has recently become an OpenID relying party (see Section 4.1.3), which might open up new possibilities in the future[74]. The current value network is illustrated in Figure 6.8.

6.4.4 Finance

Financially, Facebook Mobile is supported by the main Facebook and due to the lack of advertisements and being free to the end users, it does not generate revenue itself. Revenue sharing between phone manufacturers can exist, but public information about that is not available. Thus, the revenue model is very vague.

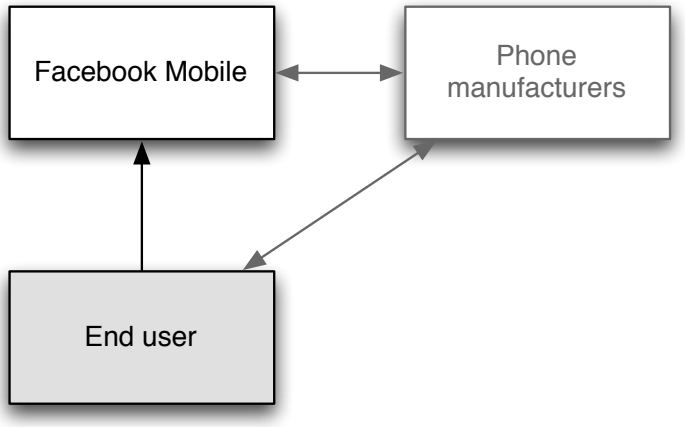

Figure 6.8: The value network for Facebook Mobile

6.4.5 User Base

The user base is very large. Facebook has reported that over 25 million people access Facebook each month with mobile devices[63]. Even though the desktop Facebook has over 175 million users as of March 2009[30], the standard service is designed for desktop WWW users. The mobile clients provide access only to a limited amount of features, which limits the attractiveness for potential new users. It can be discussed whether Facebook already has a critical mass of users that will fuel growth by itself, though.

6.4.6 Complexity

Due to its familiarity with desktop WWW Facebook, the mobile version is relatively simple to use. Installation is easy, as the multiplatform mobile WWW version requires just saving a bookmark in the phone's web browser and the native client for iPhone can be downloaded from Apple's App Store. The installation procedure for the BlackBerry client is more difficult.

6.5 Yahoo! OneConnect

Yahoo! OneConnect was a mobile social media aggregation service combining other services into one. However, Yahoo shut down OneConnect quietly during Spring 2009 when the new Yahoo! Mobile was announced, combining

Figure 6.9: Yahoo! OneConnect (source: Yahoo)

previously separated services under one umbrella. As of May 2009, OneConnect's features are not completely present in Yahoo! Mobile, so the discontinued OneConnect is analyzed in this study.

6.5.1 Service

Yahoo! OneConnect allows users to aggregate multiple social media services into one application. As of March 2009, the user can connect to Bebo, Dopplr, Facebook, Flickr, Friendster, Last.fm, MySpace, Twitter and YouTube[91]. The services are all integrated into one contact list. A contact can have multiple services merged into one, using what is available at a given moment. Positioning or camera features are missing, though, and the different services have quite simple features. A screenshot is shown in Figure 6.9.

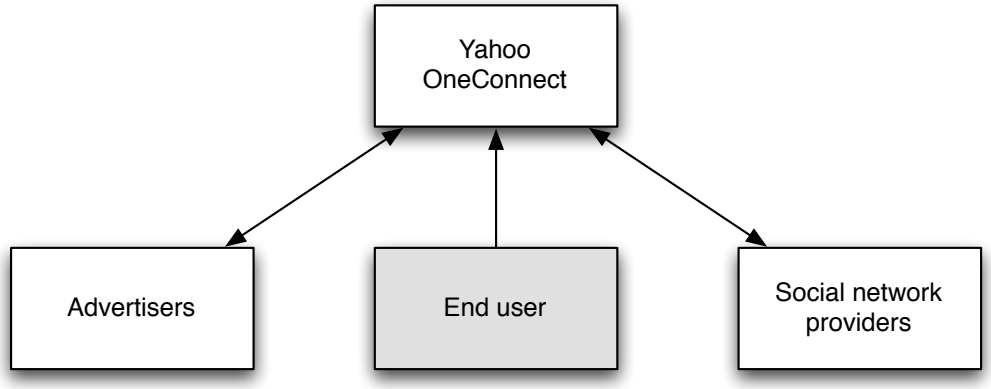

Figure 6.10: The value network for Yahoo! OneConnect

6.5.2 Technology

OneConnect's platform support is narrow, as there is only an iPhone preview version available. OneConnect is built with Yahoo's Blueprint engine, which is claimed to be platform independent. Blueprint supports GPS and manual location sharing, so positioning features could be added in the future.

6.5.3 Organization

As OneConnect is designed to connect to other services and said to use advertisements in the future, the value network is quite large. It is unknown what kind of agreements Yahoo has with the social network providers and what kind of an interface is used to communicate. The current value network is illustrated in Figure 6.10.

6.5.4 Finance

OneConnect's revenue model is still unclear as the service is in the starting stage. Currently there are no advertisements, but they could be introduced later using Yahoo's extensive mobile advertisement platform. Also, Yahoo is promoting mobile network operator co-operation, so revenue sharing models are possible as well.

6.5.5 User Base

OneConnect's user base is minimal as the service is in a preview stage. However, the integrated services provide a very large connectable user base. Yahoo also has the marketing power to promote the product and financial resources to sustain development without a need for advertisement revenue from a large user base.

6.5.6 Complexity

The basic usage is quite simple. The services are integrated well together, and the user interface is very intuitive. OneConnect is available from Apple's App Store, which translates into an easy installation as well.

6.6 ShoZu

ShoZu started as a mobile application enabling direct photo sending to Flickr from a mobile phone with integrated geotagging. Lately ShoZu has added other social networks into its repertoire, which allows the user to connect multiple services into a single application. These are not aggregated into one user interface, so it is not categorized as an aggregating service.

6.6.1 Service

ShoZu allows the user to use a single application for connecting to several social media services. Depending on the service, it features status updates, media upload and messaging. The media upload features are integrated directly in to the phone's camera interface for most platforms. In addition, it uses GPS information if available to embed a geotag into the sent image. The amount of services as of May 2009 is impressive, including Flickr, Facebook, Dailymotion, Photobucket, Twitter, Youtube, Friendster, 23, blip.tv, Box.net, Buzznet, Cellfish, divShare, Easy-Share.com, Faces.com, HotSMS, Hyves, ipernity, Kodak EasyShare Gallery, Multiply, Netlog, Nokia Ovi, Phanfare, Photobox, Photoshop.com, Picasa, Pikeo, Qipit, Seesmic, Smugmug, Snapfish, SnapMyLife, Twitpic, Webshots, Blogger, Dada, Freewebs, LiveJournal, MetaWeblog, Moblog, Typepad, Vox, Windows Live Spaces and WordPress. Additionally, ShoZu can send images and videos to news

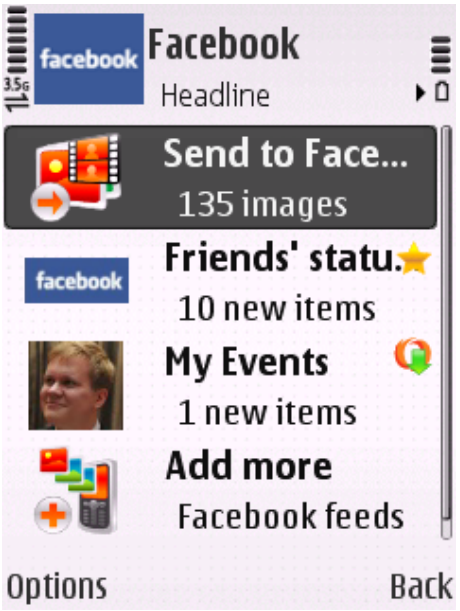

Figure 6.11: ShoZu running on Symbian S60 (source: self taken)

services such as BBC news, CNN, ITV, NowPublic and Reuters. A screenshot is shown in Figure 6.11.

6.6.2 Technology

ShoZu has a wide platform support, with Symbian S60 v2 and v3, Apple iPhone, BlackBerry, UIQ, Java ME and Windows Mobile. In most of the platforms, it integrates itself into the phone's photo and video taking menu, offering direct sending to a service after a picture has been snapped. The pictures can be tagged and geotagged using GPS on-the-fly. Locationing isn't used for any other purposes, though.

6.6.3 Organization

ShoZu's value network is very complex, as it can connect to a large number of services. Additionally, ShoZu has agreements with phone manufacturers, mobile network operators and advertisers. The services are connected by first logging in to ShoZu's desktop WWW site and then logging into the wanted service which shares trust tokens between ShoZu and the service. The user is in control of many aspects when and how ShoZu can use a particular service.

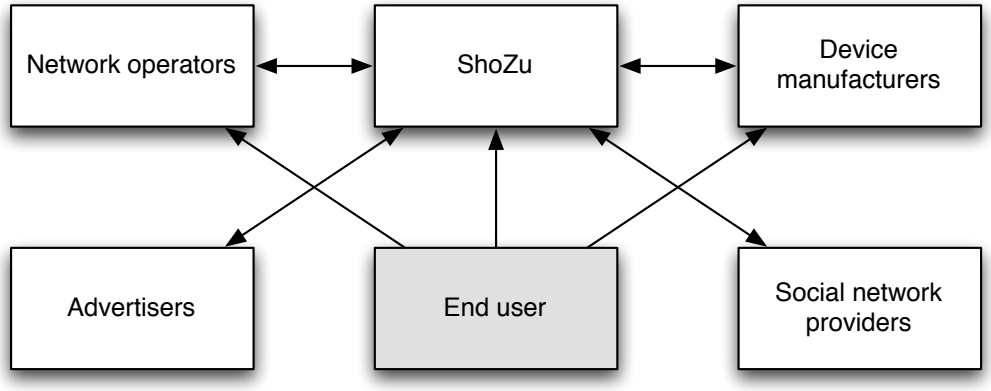

Figure 6.12: The value network for ShoZu

Some users may be concerned about privacy issues, as all of the traffic and passwords are going through ShoZu's servers and not directly to the actual service provider. However, it is mandatory for the integration of services with today's technologies. The current value network is illustrated in Figure 6.12.

6.6.4 Finance

ShoZu's business model is to integrate itself with as many players as possible. Revenue sharing with service providers, mobile operators and handset manufacturers provide income[76]. In return, the service providers will get more users, mobile operators will get data transfer fees or subscriptions and the handset manufacturers will have a feature with which to distinguish itself from others[75]. Also, both click-through advertisements and *ZuCasts*, mobile video advertisements, are also provided. The service is free to the end users.

6.6.5 User Base

ShoZu does not disclose the number of users publicly, but as the service has existed for several years and is relatively known in the public, it can be assumed that ShoZu has a solid user base. The connectable user base is very large, as there are numerous services that can be used through ShoZu.

6.6.6 Complexity

The amount of services and the separation of them make ShoZu hard to comprehend for the average user. The user interface is complex also due to a careful approach on data transfer. Depending on the platform, installation is difficult too. Some Motorola mobile phones have ShoZu preinstalled, though. If the complexity is not decreased, the user base probably will not grow beyond technical experts.

6.7 OtaSizzle

OtaSizzle is an academic testbed for different mobile services. The testbed is used to host several different projects as of May 2009. Otasizzle is unique due to the fact that the services are being tested with students who reside on a tight campus area. This enables location-based social media services to be tested with a smaller amount of total users than in full-blown global services. Additionally, as it is not a commercial service, research on usage patterns can be published academically.

6.7.1 Service

Presently, OtaSizzle contains two services, Ossi and Kassi. Ossi is a mobile messaging service utilizing public and private channels and user profiles. Kassi was designed to allow users within the community to rent or loan things to other members in the community, as well as to allow small real-world services to be exchanged. The goals of Kassi are to promote efficient usage of resources within a student community, where resources are often sparse. A screenshot of OtaSizzle's Ossi is shown in Figure 6.13.

6.7.2 Technology

Ossi and Kassi are both based on OtaSizzle Common Services, an universal service platform handling user profiles and authentication. Ossi functions within the mobile WWW platform using JavaScript heavily. Kassi does not have a mobile interface yet, though. Common Services, or COS, is designed to be very flexible and to allow third party services to be developed and used within OtaSizzle. Camera features are not implemented, but locationing

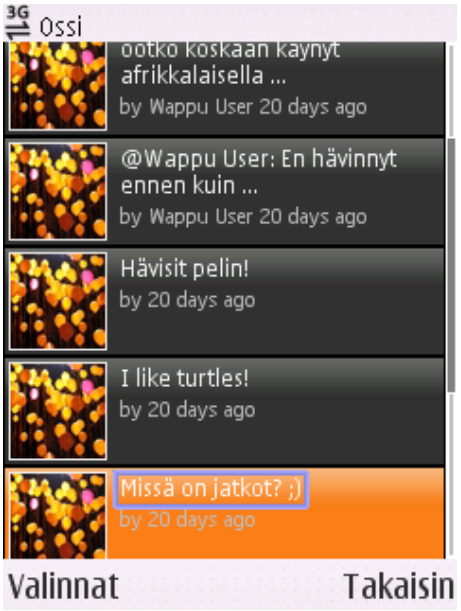

Figure 6.13: OtaSizzle Ossi running on Symbian S60 (source: self taken)

features are to be used, utilizing a native client running on the mobile phones.

6.7.3 Organization

OtaSizzle's value network is still developing. Technically, the COS is the basic platform which the user accesses, and can use services that are built on top of it. Connections to third party services are under consideration, which would enable communication between different services. The current value network is illustrated in Figure 6.14.

6.7.4 Finance

OtaSizzle does not have a business model yet, as it is a publicly funded research project. It could be used as a communications platform for enterprise use, but the revenue models cannot be predicted yet.

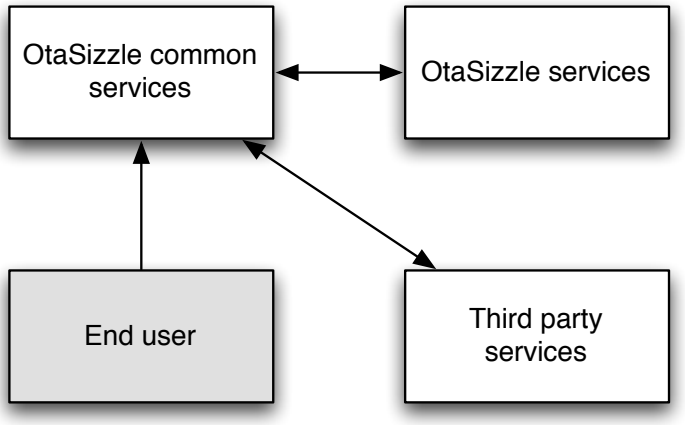

Figure 6.14: The value network for OtaSizzle

6.7.5 User Base

Presently, the user base is extremely small. However, the user base is tightly concentrated into the Otaniemi campus area, which makes the service more valuable to end users. As there are no third party services available, a connectable user base does not exist.

6.7.6 Complexity

OtaSizzle Ossi is running as a mobile WWW service, so the installation is relatively easy. Also, the user interface is adapted well for mobile use. Locationing features require a separate native client to be installed, and presently is very difficult for an average user to comprehend.

6.8 Case Comparison

The case comparison is summarized in Table 6.1. The advantages with Nokia's Ovi Contacts is that the technological issues are very well covered and the services are easy to use once they are integrated to new phones. Also, Ovi Contacts has locationing features, which can be very valuable to the users. Financially, the revenue model is solid, although the service itself does not generate any revenue. On the other hand, both the existing user

	Nokia Ovi	**Facebook Mobile**	**OneConnect**	**ShoZu**	**OtaSizzle**
Service	Good	Good	Excellent	Good	Potentially very good
Technology	Excellent, although limited to one platform	Not very good	Not very good	Very good	Good
Organization	Not very good	Not very good	Good	Excellent	Not very good
Finance	Good	Not very good	Good	Very good	Not very good
User base	Minimal	Very good	Minimal	Good	Minimal
Complexity	Low	Low	Low	High	High

Table 6.1: Case comparison

base and the connectable user base are very small, which discourages other adopters than innovators from starting to use the service.

In comparison, Facebook Mobile has a very large user base, which creates value to the end user. It is limited in mobile-specific features, though, and its business model isn't very good. The platform coverage is quite wide, which can encourage users to adopt it.

Yahoo! OneConnect and other aggregating services provide access to multiple services at once, which is very useful to end users. Also, the connectable user base is very large. OneConnect's business model is based on advertisements and its validity remains to be seen, but it is financially backed by a large company. The service is easy and intuitive to use, but the lack of mobile-specific features can limit its usefulness in the mobile context, though.

ShoZu utilizes the available mobile-specific features such as media capture and positioning, but the service is very complex to the end users. ShoZu has a wide array of connectable services and its business model is valid. Still, it probably will not be adopted by non-technical people, which limits the potential user base.

OtaSizzle can be developed according to user input due to it being a research platform. It is very open to new services, and will provide location-based services in the future. The small user base limits the attractiveness, though, and currently it is quite complex to use.

All of the services are free to the end user and the revenue models are still developing. The existing cases evaluated are not seen as providing enough value for the end user to use the mobile client as a primary way of communicating, though. Instead, they are seen as secondary ways, which are used if the primary way is not available. Most of the services are also very complex to end users, and the installation procedure is not easy and straightforward.

This is seen as the most critical issue in mobile social media service adoption to the masses.

6.9 The Fourth Scenario

The fourth scenario is described as combining aggregation between services and mobile specific features. As seen from from Figure 6.3, it does not have any commercial implementations yet. OtaSizzle, an academic research platform, can be developed to include these features. Based on research on service diffusion and the previous sections, complexity is the primary barrier for service adoption. Thus, the service must be as simple to use as possible. Integration into the mobile phone's main user interface would reduce complexity and make it intuitive for non-expert users. One likely possibility would be to combine the standard phonebook with social media contacts and presence features like in Ovi Contacts.

When considering network externalities, the service should be able to interconnect with standard social media platforms as well as other services in order to maximize the connectable user base. The greatest value of the service to the end user is in the interconnected social media network. These services should be aggregated together like in Yahoo! OneConnect which is valuable for the end user. Aggregation of different services enables the convergence of different communication methods. When selecting a contact, the service would suggest the best available method for communicating with them. Presence data could be obtained from the mobile network operator through their open interfaces.

As the platforms are very different at the moment, development should be concentrated on the target geographical area's most used platforms. As the technology behind mobile WWW advances, such as HTML 5 and Widget technologies, it could be the global platform of choice in the future. Since the mobile phone is always with the user, positioning should be used extensively. This is the primary feature desktop WWW based services do not have and would suit the mobile usage scenarios very well. The service should show nearby contacts on a map, as well as customizable alerts. Locationing could also show general points of interest, such as entertainment, shopping and restaurants with comments and coupon sharing by contacts. As privacy issues are critical for locationing, the disclosure of the user's position should be extensively controlled by the user. Different groups or users could see the user's position with different precision. Camera features are also exclusive to mobile phones. In the service, the user should be able to immediately send

taken pictures and videos to social media services to share with contacts. The pictures would have context metadata attached to them, such as the location on a map.

The revenue models for mobile social media services are still unclear. Enabling micropayments could facilitate easier purchasing of goods, and social coupons would provide advertisement revenue possibilities. Including device manufacturers and mobile network operators in the value network for revenue sharing would be the ideal model for a sustainable service.

Chapter 7

Conclusion

This study tried to find an answer to why mobile social media services haven't gained popularity and valid business models despite the technological development to support these services. The primary reason for it was found to be the complexity of current services, which fits existing theory[70]. Additionally, the service installation needs to be simple. Different platforms have announced application distribution services to enable easier finding and installation of new service applications, which can help social media service adoption in the future.

The existence of many alternative designs and scenarios imply that the mobile social media services are in a fermentation phase of a technology cycle, where the dominant design is being chosen[5]. Currently, the market uncertainty is high, and the service providers do not know what the customers need. According to theory, critical mass of users is difficult to gain when the service is closed and centrally managed[36]. This calls for distributed and open service architectures to enable experimentation and to gain enough users for network externalities. Open social media platforms, such as OpenSocial, could bring the competitors together, possibly even creating a single unified network of services like what happened with e-mail. Experimentation will result in a service which is valuable enough for the end users to be selected as the dominant design. Then, uncertainty is decreased and the service structure is shifted back towards a central management[36]. This design is then incrementally improved until a new technological discontinuity appears.

The revenue models for mobile social media services are not very clear at the moment. Advertising is the most popular revenue model in standard desktop WWW social media services, which does not fit the typical mobile or social media usage scenarios. Instead, revenue sharing with device manufacturers

or mobile network operators could work better. Revenue sharing is only possible with a few services, though, forcing new entrants to find alternative revenue models.

The future for mobile social media services is seen as bright, though. As the services are incrementally developed to include real-time communication features and gaining leverage and network externalities through maximizing the connectable user base, they can be seen as a substitute to traditional mobile services. Off-line social networks can have a new layer of on-line communication, which is used daily and as a primary medium for communication. However, this requires compatibility and interworking between different services. Flat-rate data transfer packages can be seen as a prerequisite for service adoption, but it is not yet available globally or seen as useful for most customers. As technology develops, the different service platforms and mobile features change. The platforms are supposed to become less fragmented with new standard technologies. Positioning and camera hardware are increasingly common in less and less expensive mobile phones, which makes services utilizing them more attractive to larger populations.

The whole mobile service provision can be seen as drifting towards operator independence and a bit-pipe business model for them, unless they can either integrate themselves into the social media services or force restrictions through usage policies.

7.1 Future Work

Future research is needed for analyzing the technological platforms as they develop as well as the implications of open social media platforms. Usability will become a strong focus for research. Location-based services are finally taking off as positioning features become more common. Participation in developing OtaSizzle will provide possibilities for extensive mobile social media research. The changing role of the network operator is very interesting and requires further attention, as the whole mobile industry will change radically.

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