SCHOOL OF ECONOMICS AND MANAGEMENT
Lund University

Mobile Operators Future Business Model
- Strategic Implications of Emerging Networks

Master Thesis
Strategic Management 2006/2007
FEK 591

Authors:
Anders Bernadotte af Wisborg Hedström
Richard Glimstedt
Carl-Johan Medin

Tutors:
Professor Allan T. Malm
PhD Fredrik Häglund

Abstract

Title:	Mobile Operators Future Business Model – Strategic Implications of Emerging Networks
Seminar date:	8Th of June 2007
Course:	Master Thesis in Strategic Management, Lund University (FEK 591)
Authors:	Anders Bernadotte af Wisborg Hedström, Richard Glimstedt, Carl-Johan Medin
Tutors:	Professor Allan T. Malm, PhD Fredrik Häglund
Key words:	Mobile Operator, Mobile Industry, Business Model, New Emerging Networks, Telecommunications, Internet.
Purpose:	The aim with this study is to analyse mobile operators need to assess and value the transformations of technology and market conditions in order to solve their complex environment by depicting several alternative business models.
Methodology:	The thesis is based on a qualitative research of the mobile operator industry. The empirical data has been gathered from semi-structured interviews with business experts and people within the industry. Additional written information is collected from numerous types of sources including business and industry press, Internet, scientific articles and litteratur.
Theory:	The chosen theoretical base covers the theories of value migration, value network and blinders of dominant logic. Furthermore, theories dealing with business models constitute a central part. Finally, the theory of service opportunity matrix and the customer as innovator are also used.
Conclusions:	New networks and technologies are changing the industry conditions for the mobile operators. In order to not to stagnate or fall behind and loose market shares it is of great importance that the operators' strategy is proactive and that the operator redesigns their existing but profitable business models. In the analysis we identified three different and innovative business models and applied them to the future industry conditions.

Abstrakt

Titel:	Mobiloperatörers Framtida Affärsmodell – Nya Nätverks Strategiska Innebörd
Seminariedatum:	8 juni 2007
Kurs och Ämne:	Magisteruppsats i Strategic Management, Lunds Universitet, (FEK 591)
Författare:	Anders Bernadotte af Wisborg Hedström, Carl-Johan Medin, Richard Glimstedt
Handledare:	Professor Allan T. Malm, Doktorand Fredrik Häglund
Nyckelord:	Mobiloperatörer, Mobilbranschen, Affärsmodell, Nya Nätverk, Telekom, Internet.
Syfte:	Syftet med uppsatsen är att analysera mobil operatörernas behov att värdera teknologiska förändringar och marknadsomständigheter för att sedan kunna lägga fram olika alternativ av affärsmodeller.
Metod:	Uppsatsen är baserad på en kvalitativ undersökning av mobiloperatörbranschen. Det empiriska materialet har samlats in genom semistrukturerade intervjuer med branschexperter och personer med mycket erfarenhet av branschen. Sekundärdata är hämtad från affärs och branschtidningar, Internet, vetenskapliga artiklar och litteratur.
Teori:	För att tydligt beskriva och förklara de förändringar som sker på marknaden har vi valt teorier om värdekedjor och värde förflyttning samt ”blinders of dominant logic”. Vidare genomgås det teorier om värdeskapande och affärsmodeller som är den centrala delen för att underbygga de alternativa affärsmodeller som vi presenterar i analysen och slutsatsen. Sist har vi använt oss av teorin om ”service opportunity” matrisen.
Slutsatser:	Nya nätverk och teknologier håller på att förändra den stabila mobiltelefonimarknaden och därmed branschförhållandena för operatörerna. För att inte tappa marknadsandelar och attrahera nya kunder måste de vara proaktiva i sina strategier vilket inte är fallet idag. Vi har i analysen kommit fram till tre olika affärsmodeller vi anser vara lämpliga att ta i beaktning vid anpassning till de kommande marknadsförhållandena.

Table of Content

Table of Figures

I. Introduction

The introductory chapter outlines the founding components of the subject's background in order to present the main issues studied. Additionally, the study's delimitations, purpose and target audience are defined.

1.1 Background

During the past fifteen years, modern societies have experienced grand revolutions initiated by two major technological innovations: the Internet and Mobile telephony. The broad consequences resulting from those groundbreaking technologies entail a wide range of domains originating from the world of communication. Mobile phones and the Internet are today on the threshold of integration leaving us very enthusiastic over what the future has to hold. Consequently it is widely acknowledged within the field of telecommunications that the upcoming years will probably be highly crucial and significant in shaping the industry's future.

With worldwide mobile phone sales running at well over 600 million units a year and 35 to 40% of today's users are willing to pay extra for additional features beyond voice and SMS, it is not a market to neglect.[1] In the first quarter of 2006, the data-traffic over mobile networks was four times higher than during the corresponding period of the previous year, indicating the abundance of all emerging features.[2]

Several technological innovations along with the continuous evolution of the infrastructural networks have progressively redefined the use of mobile devices. New applications are constantly being added including equipment devices ranging from address books and organizers to digital cameras and mp3 players, resulting in

[1] Figures: mobileopportunity.blogspot.com, *The myth of the smartphone market*, Michael Mace, Rubicon Consulting, Oct 2005.
[2] "Genombrott för mobildata", Computer Sweden, Nov 29 2006.

one multifunctional too, thus reducing the need for several different devices. Therefore the functional fields of the mobile phone, the PDA (Personal Digital Assistant), the laptop, are progressively merging together. The CEO of Symbian, Nigel Clifford believes that by 2010 the mobile phone will have turned into "a remote control for life".[3]

In recent years, mobile operators have witnessed a marked evolution of different mobile networks. Initially, a move from the traditional GSM-net, also called 2G, to the 3G infrastructures enabling data transmission of higher capacity marked the starting point of an evolving mobile business. At this point, the initial use of mobile phones and main focus of operators, broadened towards greater areas of activity than just voice calls. Web browsers were incorporated into mobile phones, as well as several features such as colour-screens and video-calls.

Today's recently developed networks, HSDPA also called 3G-Turbo, adopted by a few early mobile operators, provides users with even more possibilities, of better speed and quality. An alternative technology called W-Lan, commonly branded as WiFi, provides a high capacity transfer of data over short distances using an enabled computer or mobile phone. Users can reach local W-Lan networks free of charge or simply by subscribing to a wireless provider. A further developed technology using W-Lan is WiMax, which reaches over longer distances.

Through rapid network development and investments in the industry of wireless telecommunications, producers and operators are starting to offer a broad range of convenient and abundant Internet-features to the end user.

The recent deal between the mobile operator 3 and Skype resulted in the X-series

[3] "Mobile devices: What are we meant to do with all this?" by Mary Branscombe, ft.com, Oct 4 2006.

mobile phone that enables VoIP (Voice over Internet Protocol)-calls. This illustrates the mutual interest of operators and web based actors to think in terms of joint business activities. VoIP permits individuals to call almost free of charge using an Internet access instead of using a traditional, costly operator's network.

Frank Sixt, Finance Director at Hutchinson Whampoa, a Hong-Kong based group owner of the company 3, stated that "We are setting a course that will take us away from the per minute, per message, per click, per event and per megabit charging universe that we live in today, and towards one simple but compelling proposition: it's free when you use it".[4] Many other mobile operators are also increasingly paying attention to what the convergence of the mobile and web-based spheres actually induce. The model below presented at a conference illustrates what the convergence to mobile Internet could include.

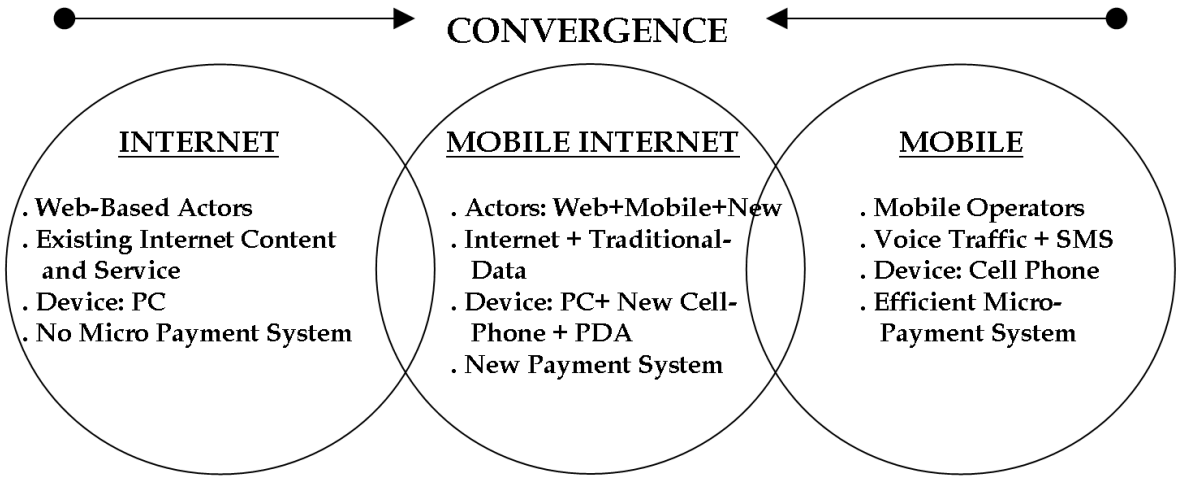

Figure.1: Converging the Internet Mobile Communication[5]

"We are facing bigger changes in the coming five years than we have seen for the past hundred years" according to Hjalmar Winbladh, CEO and co-founder of Rebtel.[6] Not only are those conditions of importance for the operator but also concerns the

[4] www.timesonline.co.uk Waples J., "3 finds the right way to do mobile Internet", November 19 2006.
[5] Adapted from Jukka Helin, TeliaSonera, slides presented at the "mBusiness Conference in Vienna" June, 2003.
[6] Computer Sweden, Dec 1 2006.

future of the telecommunications in its whole. The major industry of telecommunications will be fundamentally transformed in one way or another and it puts especially the mobile operators in a challenging situation with an infinite set of essential strategic questions.

1.2 Problem discussion

Internet's progressive penetration in the telecom sector offers new potential applications, which most likely will result in a great number of new entrants and competitors. From an operator's perspective, the assessment of the recently developed networks and the upcoming transformation of the telecommunications market is crucial and places them in front of an intricate strategic crossroad including both new risks as well as new windows of opportunities.

Given that traditional mobile telephony is becoming less promising, operators have to develop co-operations with Internet-giants in order to be part of the evolution, make significant profits and avoid being restrained to the state of a simple access supplier.[7] Consequently operators are forced to offer radically new services, and come up with innovative promotions and find optimal ways to protect their market shares.

A primary difficulty lies in the issue of redefined roles due to the mentioned evolution. The market structure that mobile operators are used to operate in, is very complex as it is. Adding the influential web-based actors requires taking into account parties that stems from radically different sectors.

[7] "Alla mot alla på mobilt Internet", Computer Sweden, Feb 16 2006.

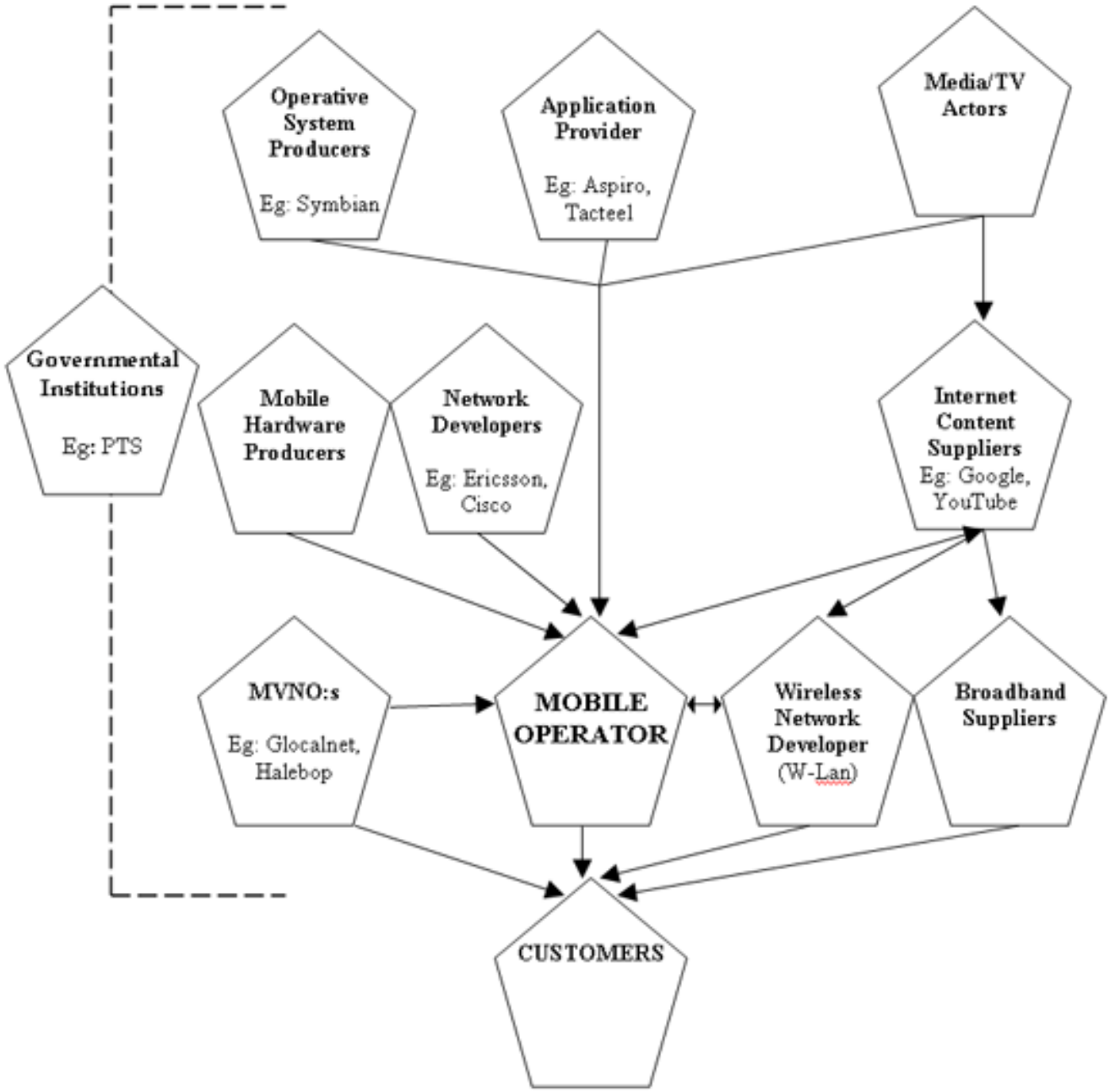

Figure 2: Mobile Market Structure

"2007 is the Year of the Business Model"

Hamid Akhavan, CEO of T-Mobile International.[8]

[8] www.telco.com, Nov 13 2006.

As traditional actors are reconsidering the scope of their primary activities and new entrants are threatening to benefit from the upcoming state of the market, the positioning of operators is therefore uncertain. Consequently, mobile operator's chosen course of action and way of adapting their current business model will be a decisive episode.

Many operators have done a superb job over the last 3-5 years in creating value but in a changing environment the business models that worked in the past will be less successful when moving forward.[9] To date, operators have been very careful not to jeopardize their business models which are predominantly focused on voice services because of considerable revenues.

Adapting the initial business model to web based services results in tricky pricing issues, when attempting to expand the existing pricing structure that is in stark contrast to the "free culture" on the web. The user is commonly used to a free web culture, where the only cost is a flat-rate access charge. Existing activities and services online that are available on a free basis (e.g. email, Skype, information search and communication) stand for great potential applied to the mobile field but are not easily charged for.

In addition to the uncertain revenue structure, the future of mobile operators in a converged market raises the questions of which groups of customers to target, what would be an appealing proposition to ones segment and how to benefit from adapted services and sources of value. Operators' strategies are something of a mystery, coping with threats and opportunities as they move towards uncertain future scenarios. How should telecom operators reflect upon the emerging technologies that are sought after?

[9] www.telco.net/blog "Telco 2.0 Survey Update", November 13 2006.

The study's main issue is dual:

1. What will be the determining aspects operators have to take into account in order to cope with forthcoming conditional factors within the next five years?
2. Given the market changes with emerging networks, how does operators business model have to change to be competitive?

1.3 Delimitations

The study is primarily focused on the Swedish mobile market although a couple of respondents are not professionally active in Sweden. We made the assumption that central traits of the mobile industry can be looked upon globally.

Considering the limited amount of time and resources available to this study, some restricting priorities have had to be taken. In order to cover the subject in a fairly realistic way, we have prioritized two main perspectives. The innovation and industry perspectives allow us to study mobile operators current situation, upcoming challenges as well as the implications regarding their business models from a broader outlook.

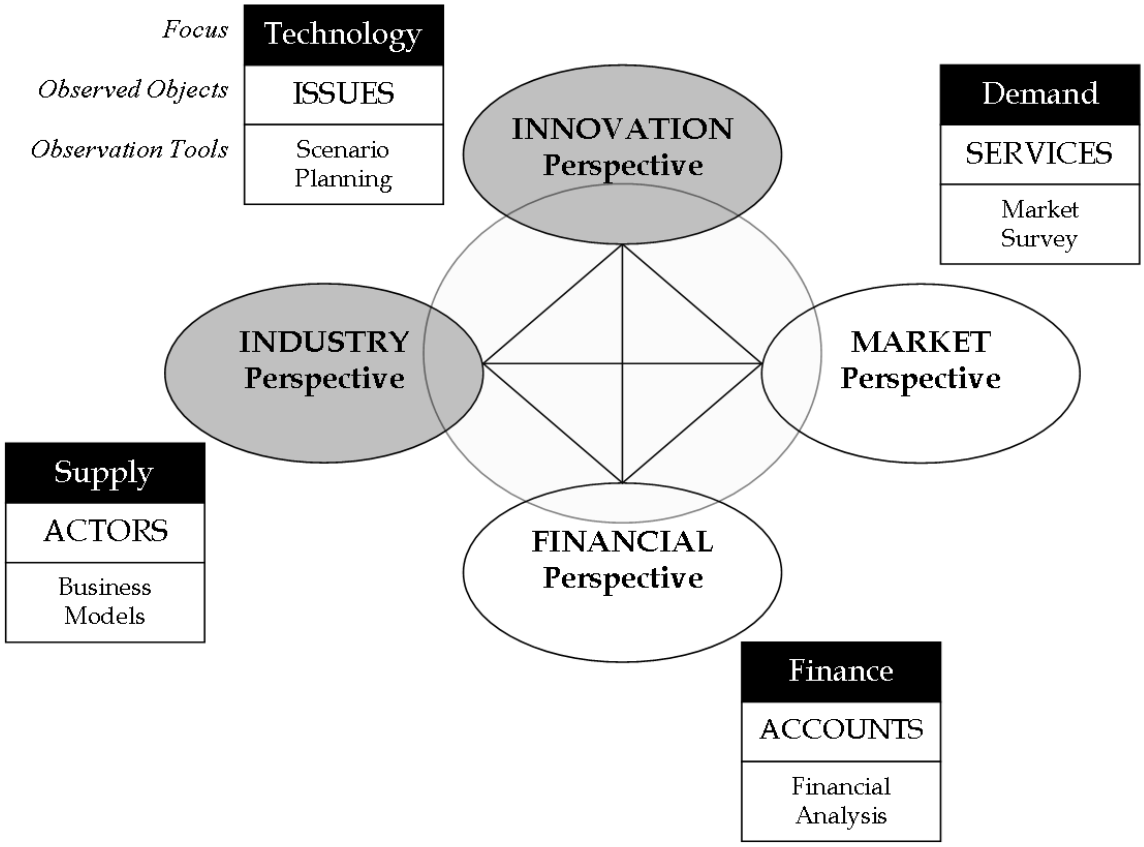

Figure 3: Mobile Market Scorecard: Four Perspectives[10]

The innovation perspective deals with the future technological evolution of the mobile landscape, especially infrastructural issues concerning competing networks. It is intended to constitute a conditional base clarifying the overall environment mobile operators might have to deal with. In order to provide further value to the study, we have deliberately adopted the industry perspective focusing on mobile operators business models providing us with more precise implications resulting from the technological uncertainties.

It is also intended that those two different perspectives are complementing each other and help us understand the multifaceted issues of the study in a better way. It is also important to clarify which areas not studied to the same extent. We have the remaining objective that the market and financial perspectives are not completely excluded nor neglected when gathering information to the empirical material of the

[10] Adapted from Camponovo, G. & Pigneur, Y., *Business Model Analysis applied to Mobile Business*, 2003.

research. Without having conducted a market survey or an extensive financial analysis, these key areas are still dealt with by studying operators market segments as well as revenue model. The service management theories and customer related empirical findings are also closely linked to prime market issues.

The underlying motive of focusing on two perspectives and balancing them all four is to maximize our work's clarity and preciseness. However to fulfil the study's purpose as richly as possible, none of the above mentioned points of view can be completely disregarded nor excluded. Having that form of trade-off in mind, most of the data-collection process could be facilitated and better conducted.

1.4 Purpose

Taking the implications of a changing environment within the forthcoming years as a point of departure, the study's aim is to analyse mobile operators' need to assess and value the transformations of technology and market conditions. That in turn serves as a basis for developing several alternative business models that are better suited for the new circumstances. Our aim is therefore to depict possible scenarios of operators' future competitive environment and in addition, develop business models that could be congruent with theses scenarios.

1.5 Target audience

With this thesis we aim to develop a useful debate among involved and interested persons and companies. Strategic managers and leaders actively working within the mobile industry might value the study and take it into account for own strategic evaluations and courses of action. Ultimately a current mobile operator might be able to reassess its business design on the basis of the study. Eventually the study's findings could serve as basis for future consciousness and understanding of moving markets and technological evolution.

1.6 Disposition

The study's chapters are disposed as following:

I. Introduction: The introductory chapter's prologue draws the founding facets of the mobile industry and is followed by a problem discussion leading to the study's main issue and primary purpose.

II. Methodology: This chapter describes our line of action, explains and motivates the chosen methodological reasoning.

III. Theory: The theoretical chapter presents the chosen theories that are intended to help us fulfil the study's purpose.

IV. Empirical Material: In this chapter we summarize the collected empirical material originating from the conducted interviews and numerous sources.

V. Analysis: In the analytical chapter we apply the chosen theories to the empirical findings when trying to answer the study's main issues.

VI. Conclusions: In conclusion we compile the results of the analysis and propose subjects for further studies.

II. Methodology

This chapter goes through the methodological choices made when conducting the study. It is intended to facilitate the understanding of how we have proceeded in every stage of the study by presenting a motivation for the most influential choices.

2.1 Selection of Subject

The selection of subject originates from own areas of interest and knowledge as well as educational specialization. Apart from being within telecom or IT, an original requirement when selecting the subject, was that it had to be contemporary and important. Professor Allan T. Malm, suggested to contact Conveneer, a firm looking for Strategic Management students at Master level willing to conduct a research about Internet communities and telecommunications. The exact selection of subject being mobile operator's future business model, results from a continuous effort of evaluating several related subjects, perspectives and issues. We found that the mobile industry's close future is very uncertain and hard to predict. It later became even more apparent that the selected subject was on everybody's lips and constantly renewed since many firms in question are engaging in new actions and deals. On the other hand it also turned out that the subjects true complexity might have been underestimated considering that most analysts and experts have a very hard time trying to solve the problem.

2.2 Research Methods

Because of the mobile industry's complexity valuable information and opinion of interest is believed to be relatively scarce. Professionals with good industry insight, experts and managers have differing points of view and have highly speculative hypothesis on how the industry will develop in the future.

The vast information regarding mobile networks, technologies and operators required thorough preparation and research aimed at improving our limited knowledge. In addition, the primary interest being emerging technologies implies being constantly up-to-date with the latest information of the industry.

The initial research mixed different areas of the industry, its actors, the existing and upcoming technologies as well as the strategic consequences and future significance for mobile operators. The collected information was primarily gathered from secondary data such as Internet sites and blogs where the latest news, expert reviews and debates are published on a daily basis. Furthermore, specialized newspapers publishing a wide variety of branch analysis stand for an important part of the preparation research. A complete presentation of the secondary data collection is found in a latter part of this chapter.[11]

Following the founding research and preparation stage of the project, we started to investigate different interview prospects. Our interest was directed towards highly competent experts i.e. consultants (Telemanagement) and people with good insight of network development (Labs2 and Nordisk Mobiltelefoni) as well as respondents from the mobile operator business (3, Telia and British Telecom). With the information and data collected throughout the selected interviews we were able to formulate a broader view of the current mobile industry by somewhat distancing ourselves from a more narrow operator perspective. It became also apparent that because of the study's diverse nature, merging the different industries of mobile telecommunications, Internet, media and entertainment, we would need input from related actors on the forefront of that evolution. We also benefited from informal conversations with personal contacts from Tele2 and OHMTV-mobile, a firm working with added-on mobile features.[12] By bringing together different views and

[11] See paragraph 2.5.2
[12] www.ohmtv.com Dec 2006.

insights from varying parties, it is more likely to depict the industry in a balanced and multifaceted way instead of striving for a single possible future.

2.2.1 Inductive/Deductive Approach

An inductive approach focuses primarily on empirical material that is in a latter stage applied and tested to suitable theories. In other words, the research is conducted by placing a sample of reality within existing hypothesis and concepts. Correspondingly, a deductive approach proceeds from a theoretical base as a starting point and puts it in a real-world situation. Ultimately contributions and modifications to previous theoretical findings can be implemented.

We have found that an inductive approach is a more compatible way to proceed for our study. It became apparent that we first had to investigate the determining aspects operators have to take into account in order to cope with forthcoming conditional factors. In second hand we applied that empirical material to several theories, letting us analyze future business models and better understand the reality of the mobile industry.

Furthermore, a central decision to take prior to the implementation of our study is to choose a qualitative or quantitative approach. According to Bryman and Bell these are two different types of data collection methods.[13] The qualitative research uses describing data in the form of text material whereas the quantitative is more focused on gathering numerical data.

We chose to study the mobile operator industry using a qualitative approach. By researching the industry through interviews we have gained deeper information and understanding about the emerging strategic facets. Within a qualitative study, interviews are the best method to collect data because of the information needed is

[13] Bryman, A. & Bell, E., Företagsekonomiska forskningsmetoder, Malmö, Liber Ekonomi, 2005.

by nature is hardly measured.[14] In order for the respondents not to exclude any information that could be of interest, the interviews were held in a semi-constructed way. That method allows the interviewed person to give a whole picture through broader answers, instead of being restricted in their point of view.[15]

There are certain risks associated to interviews such as the questioning parties being misled to think in the same way as the respondent's answers. Being aware of these risks, we have tried to avoid this predicament when interviewing and reflecting over the collected empirical material by interviewing more people and testing our material. It required the ability to distance us from the views and opinions encountered and strive for a relative objectivity.

2.2.2 Interviews

Specific interview respondents were purposely chosen for a broad picture of the industry and its different future issues. Attempting to keep an objective perception, our respondents were not exclusively from the mobile operator business. Experts that are not currently appointed by a large operator firm, was of great interest. We aimed at finding representative respondents with experience from the business but also have a close connection to the new emerging technologies.

Thanks to our collaboration with Conveneer, we benefited from useful access to valuable contacts. However, we encountered some problems due to the lack of availability of several persons. Fortunately telephone conferences could take place with a majority of the respondents even though interviews by phone have the downside of being less effective and harder to conduct than face to face. In order to maximize the interviews to effective ones, went sent material preceding the meeting and insisted on being able to keep in touch for completing questions.

[14] Backman J, *Rapporter och uppsatser,* 1998.
[15] Halvorsen K, *Samhällsvetenskaplig metod,* 1992.

We contacted Labs2 and Nordisk Mobiltelefoni who gave us a basic understanding of the critical points induced with upcoming telecom technologies and they explained some important strategic implications of the currently existing networks.

For the operators, representatives from 3, British Telecom and Telia were interviewed both by phone and live. The sensitive content of the subject made these interviews hard to develop and conduct in a strict way. The meetings were therefore semi-structured and we had to set up some general guidelines on the subject before engaging in more specific questions. The operator interviews were central to the study's core elements but needed to be complemented by less partial opinions. For that matter, the discussion with a senior consultant at Telemanagement contributed to our purpose of diverse respondents. Complementary advice and information from personal contacts at Tele2 and OHMTV also provided insightful and influential primary data in a less official manner.

2.3 Theoretical Framework

Before choosing the actual authors and theories suitable to this study, we investigated different areas of research within the field of strategic management. At first, our interest was directed towards material related to industry analysis and future industry scenarios. It came to mind that a combination of George Day's "Strategies for surviving a shakeou"t and Michael Porter's "Five forces analysis" could be an effective theoretical base. As we searched for authors mentioned in IT and telecom related studies, we found several theories of a more precise and "hands-on" character that we determined to be more effective for the purpose of our study. Slywotzky's "Value migration", Normann and Porter's "Values Chain"-theories as well as Prahalad's "Blinders of dominant logic" constituted valuable ways of analysing the empirical material. Concerning the central part of the subject being the development of business models, we considered it to be wise combine material from

several authors since it is a rather fleeting concept. Finally, it became apparent that customer-related theories would be needed as a completion of the study.

The theories finally selected for the study are meant to cover four areas of interest and provide us with four respective levels of scope. In order to fulfil the study's purpose, the theoretical framework is following a logic order by first going through theories dealing with industrial evolution, then market structure, followed by business models and finally service management.

By narrowing the theoretical scope from the industry level, to the market's structure followed by the operator firm itself and finally to the end-customer, the study's clarity and potential to fulfil its purpose is greatly enhanced. Applying and complementing the theoretical material to the empirical findings requires such methodological precaution when handling a complex problem of such a broad range.

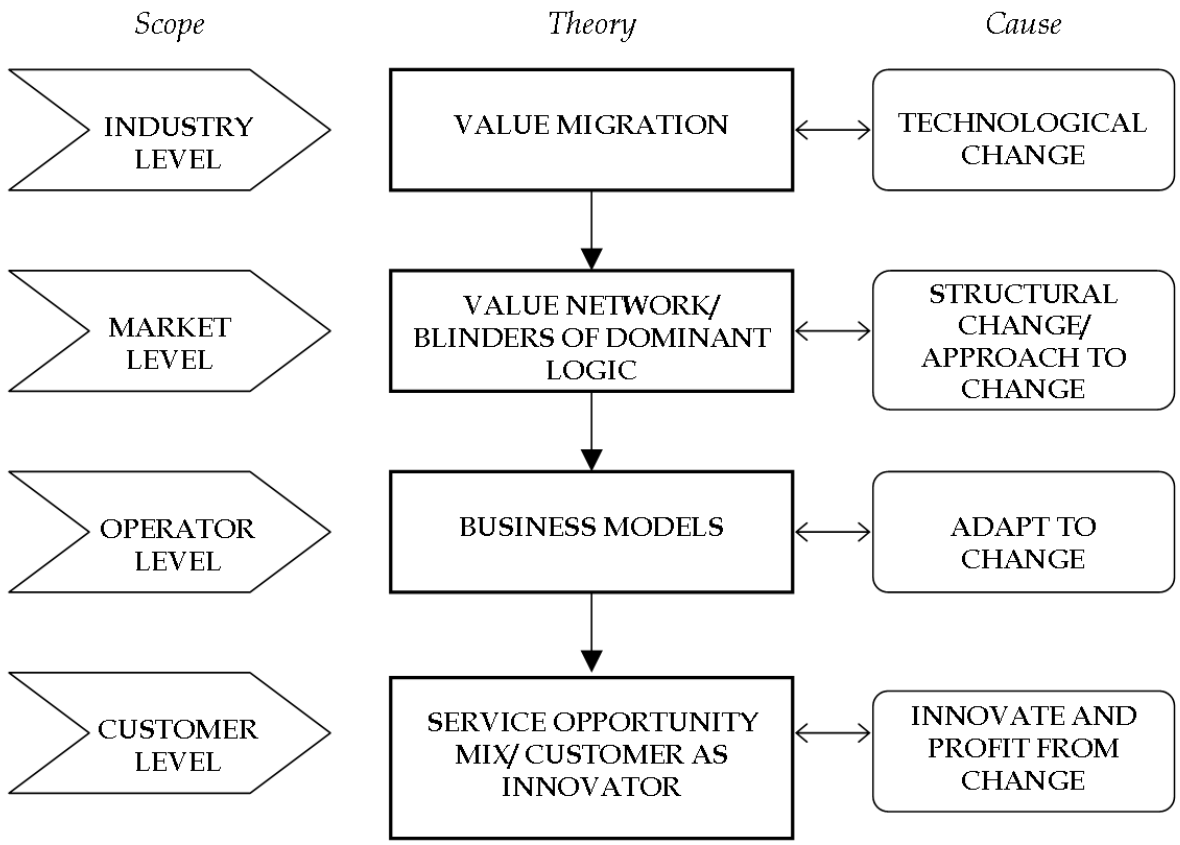

Figure 4: The Theoretical Framework in 4 steps

In order to understand what is actually happening in the industry of mobile telecommunications we have chosen to start by conceptualizing the general matters using the theory of value migration and clarify where operators stand in relation to the overall industrial evolution.

The following area deals with the complex and rapidly changing interconnections between relevant actors within the converged market structure of mobile telecommunications and Internet. The transformation of the conditional factors at market level puts the operators in a position where knowledge of an upcoming market structure is a necessity. In order to deepen that knowledge we have chosen to apply the theories of value chain, value system and value network.

Furthermore, another matter is that of how mobile operators should approach the possible future market scenarios. Shall they maintain a traditional strategy or engage in an innovative and pro-active attitude? We saw a need to enlighten the implications of considerable actors situated in a transformational phase and explain the pros and cons of maintaining a certain attitude towards a market characterized by value migration. A theory serving that purpose is the concept of blinders of dominant logic.

The third area of interest is focused on operators' business models and is central for the study's purpose. Literature on the subject of different business models or business designs being very abundant, we have made the assumption that an customized combination of several theories would be the optimal way of looking upon business models, thus constructing a more suitable one. Since the empirical findings are very rich and diverse, a rather simple business model was necessary to achieve a clear and valuable understanding of the study's main issues.

Finally we added a more precise research area, in line with central parts of the business model, intended to deepen the understanding of the customers operators are facing. The theories of customer opportunity mix and customer as innovator are useful tools when attempting to broaden ones activities and relate that offer to the end-customer. Ultimately customer-related theories induce a rather detached perspective than the previous theories using a whole different approach.

2.4 Data Collection

Since emerging mobile technology is in constant change a basic requirement was to bring together information from up-to-date sources such as articles and information gathered from blogs and other web sites. Furthermore, they are complemented by empirical material from interviews and existing literature about the subject and related theories.

2.4.1 Primary Data

The primary data is collected from many different interviews with persons within the industry, others closely connected to it and some that recently left it.

The first meeting held with Conveneer gave us valuable guidelines about mobile operators current situation, the upcoming technologies and the issues at hand. During several appointments with our tutors Professor Allan T. Malm and Phd Fredrik Häglund, the project's content as well as theoretical and methodological construction was thoroughly discussed and revised. Additionally, we took advantage of new information ranging from technological details to industrial development and strategic concerns. Conveneer and the tutor's great interest for the subject and related areas largely contributed to the design and substance of the study.

As previously pointed out different respondents were carefully selected to cover different angles of the problem and thereby reach a broad and balanced perception of the current situation. Totally there were seven meetings held with different respondents, all well documented with both written notes and recordings. All of the interviews were semi-structured and most were held in the form of telephone conferences for practical and geographical reasons. A couple of face-to-face interviews were also held and lasted approximately one to one and a half hour for each respondent. Following the interviews, we had continuous contact with some of the persons in question through e-mail and telephone to complement the empirical material with further questions of interest.

2.4.2 Secondary Data

Another crucial resource of information was the exhaustive set of secondary data. Fortunately the study's subject is of highly current interest, therefore very much covered in the media. Consequently we benefited from extensive material, articles

and high-profile interviews dealing with related topics or even sometimes, exactly the same problem.

Appropriate articles were found in the latest news and Swedish specialized magazines with a main focus on the mobile industry, Internet and IT (for example: Computer Sweden, Ny Teknik, E24). Many articles and interviews of influential leaders and mobile operators were found in Veckans Affärer, Affärsvärlden and Svenska Dagbladet. With some reservation, we interpreted direct quotations from these knowledgeable individuals in these articles as close complements to the primary data and consequently became an important part of our empirical material.
Another secondary source of data was previously conducted research and similar thesis. Due to the rapidly changing conditions of the industry some of the encountered material had to be carefully revised. This provided a lot of information that is obsolete and therefore irrelevant. However, some interesting methods of research, observations and predictions were useful for our study.

Suitable information and abundant studies could easily be found through Lund University's database. Apart from several search-engines, we primarily used Proquest to find academic papers, essays and theories.

While new technologies are rapidly evolving it is appropriate to research specific information published and discussed in a narrow timeframe. Blogs on the Internet, where professionals share, update and debate a lot of knowledge, opinions and predictions, constituted a significantly valuable resource of such data. Several examples of such blogs are Dean Bubley's Disruptive Wireless, O´Reilly, Mobile Strategies Blog, Voip and Enum, Telco 2.0 and more. When consulting some of these sites to be updated on the subject, we mostly relied on the author's trustworthiness based on their professional activity and experience. Dean Bubley, for instance, is an acknowledged wireless industry analyst with more than 14 years of experience from

leading positions in communication and telecom firms.[16] Telco 2.0, to mention another, is written by a team of 6 specialists, chief analysts and CEO:s, all with backgrounds varying from 12 to 29 years in the business.[17] We therefore tried to read material published on sites that are edited by very knowledgeable persons. Another point to keep in mind is that part of the material published on these blogs is above our own level of proficiency and knowledge of the subject. Therefore we had to be cautious on what could be of realistic value for our own part. On the other hand, following the topics and discussions of some of these sites, appeared to be a great way of thinking further on the subject and hopefully elevate the questions raised in this study to a higher level.

2.5 Reliability of sources

To optimize the quality of the thesis it is absolutely necessary to question the secondary data.[18] Valuing the reliability of the chosen sources of information is a matter of assessing the grade of distortion. Many factors can affect the information process and should therefore be treated appropriately. According to Wiedersheim, Paul and Eriksson, establishing the validity of sources is commonly aimed at deciding if we are investigating what we are supposed to investigate. Their method of testing that reliability is based upon three conceptions, the contemporary demand, the dependence requirement and the tendency requirement.

When conducting a research with rapidly changing conditions such as within the mobile industry, it is important to consider the topicality of the information used. The secondary data has to be up-to-date and actual to avoid inaccuracy.[19] For that matter we have aimed for an optimum of accuracy by constantly re-evaluating the assembled material and amend it to later data.

[16] http://www.blogger.com/profile/05719150957239368264
[17] http://www.stlpartners.com/people.php
[18] Backman J, *Rapporter och uppsatser*, 1998.
[19] Wiedersheim-Paul, *Att utreda, forska och rapportera*, 1997.

The second conception to take into consideration is the dependency requirements. This conception deals with the notion of relationships between separate sources through networks or other set of contacts.[20] Throughout the selection of data we have assumed they were not in any way interconnected and realised that such over-viewing control of our respondents and secondary sources would have been hard to reach.

The interest of the respondent or source of information is discussed within tendency requirement. If the source has an interest of presenting information in one or another way it could affect the outcome of what is believed to be reliable and valid.[21] We've had that risk in mind and discussed that matter whenever there seemed to be an uncertainty of a respondent's actual intentions. Being three persons working on the study was in this case an advantage since we could benefit from our differing views. Additionally, a greater number of respondents and an abundance of secondary data restricted the risk of being misled.

To a great extent, it's very plausible that an authors lack in objectivity but the margin of error needs to be reduced to a minimum. To avoid the risk of bias, various data and information has been selected from literature, articles, and Internet with careful attention for diversity and conflicts of interests. Taking into account and questioning the motives of authors and respondents before matching a variety of differing material, the intention has been to achieve a relatively objective process. The overall validity would have been enhanced with a greater number of interviewed persons but ineffective considering the limited timeframe.

[20] Wiedersheim-Paul, *Att utreda, forska och rapportera*, 1997.
[21] Ibid

Throughout the collection of data and the writing of the thesis, we have had a critical approach to the gathered information. Lots of questions and ideas have been raised and discussed within the group concerning these issues and concerns.

III. Theory

The theoretical section is aimed at conceptualising the mobile industry's issues and ultimately helps us develop a better understanding. The chosen theories are related to industries situated in an uncertain phase where firms need to consider different strategic paths and crucial future decisions. By studying diverse theories, we enrich our knowledge base in order to propose further relevant solutions.

3.1 Introduction

The theoretical base of the study is disposed following the four levels previously pointed out and presented in the model below.[22] These steps are classified in levels of scope, from a broader industry outlook to a precise end-customer point of view.

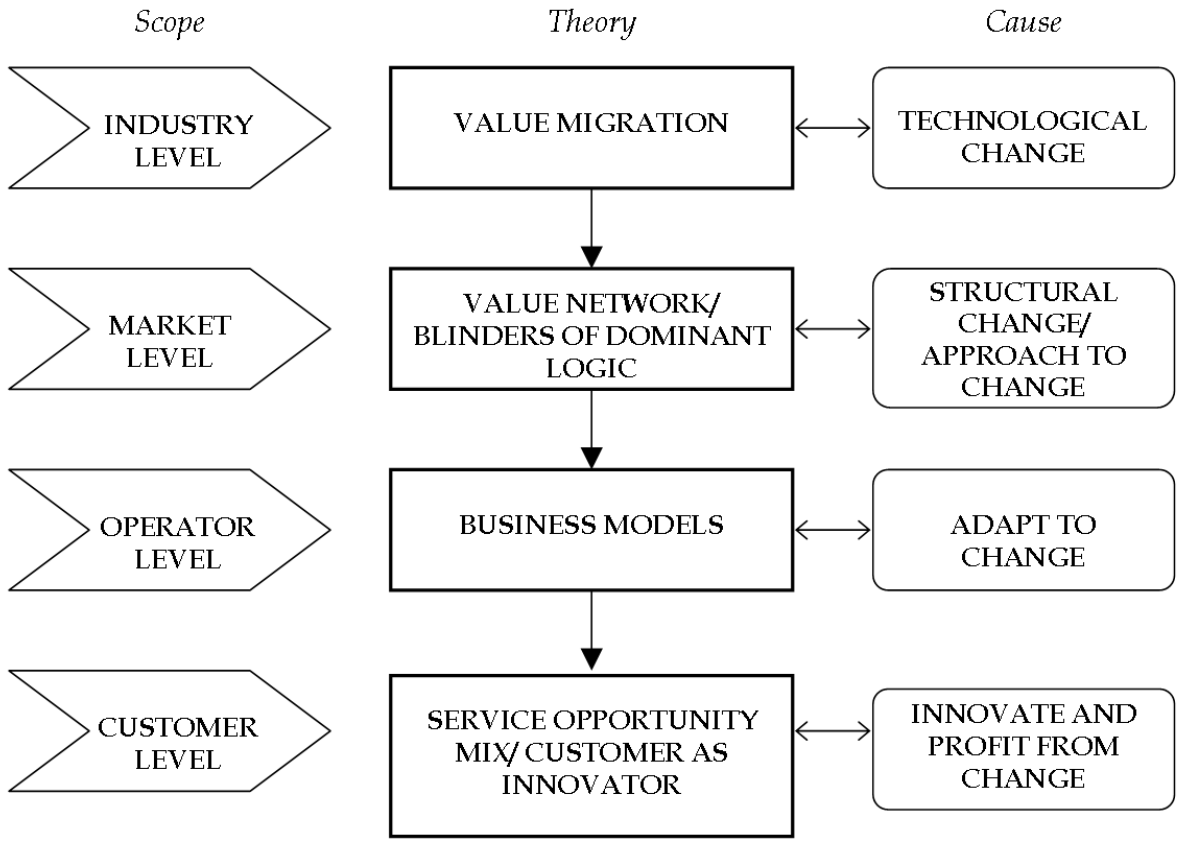

Figure 5: The Theoretical Base in 4 steps

[22] See Chapter 2.3

3.2 Value Migration

Theorists as well as practitioners, have great interest in major changes and transitions concerning the state of a company and its environment. It is widely acknowledged that products go through cycles, from growth through to obsolescence. It is not as well recognized that business designs also go through cycles and reach economic obsolescence.[23] When the mechanism that matches the company's business design to the structure of customer priorities breaks down, value migration begins to occur.[24] A flow of value occurs from old, obsolete business designs to new more effective ones.[25]

A migration can affect a specific division of a company, a whole company, or even a whole industry and can be looked upon through three stages. These stages of value migration are respectively: the value inflow, value stability and value outflow stage.

Firstly, an industry in the inflow stage provides numerous opportunities for capturing value, benefiting from limited competition, high growth and profitability. A stable industry offers value growth opportunities to those companies that improve operational efficiencies while continuing to serve customer priorities. Firms have stable market shares and margins. Once in the outflow stage experiences competitive intensity, low profits and decreasing opportunities for capturing value. In addition, in-bound talent, resources and customers leave at an accelerating rate.[26]

[23] Slywotzky, A., *Value Migration*, 1996.
[24] Ibid.
[25] Slywotzky, A. & Baumgarter, P., et.al., *Are you enjoying globalization yet?*, Journal of Business Strategy Vol.27 NO.4, 2006.
[26] Slywotzky, A., *Value Migration*, 1996.

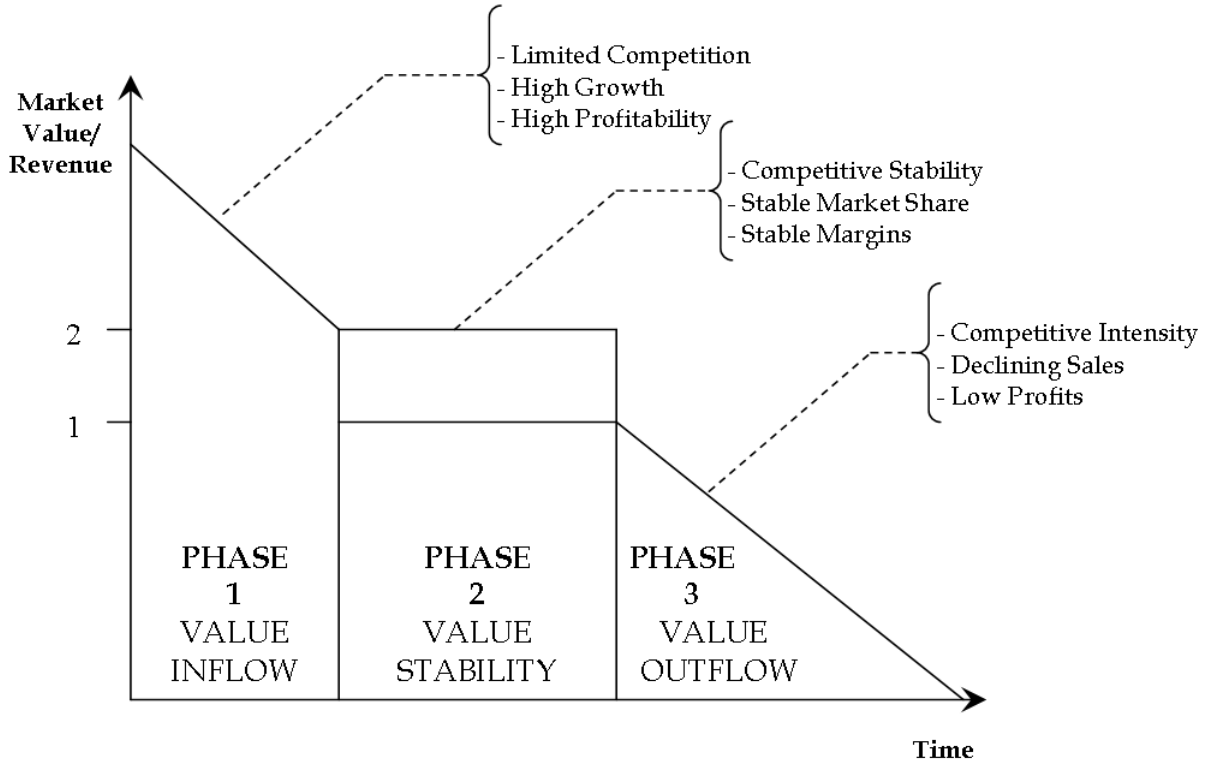

Figure 6: The Three Stages of Value Migration [27]

Within the framework of value migration, a company needs to answer the fundamental questions of where its industry and business design are in relation to each other. Mapping value migration consists of figuring out ones stage, understanding the context and assessing what to expect from the industry. Depending on the nature of the company that process can differ in complexity. For an actor engaged in multiple types of businesses, it is much more difficult to define market value and revenues than for a single-design company evolving in only one industry.[28]

Transitions are notoriously complicated, making them a weak link for companies in changing markets.[29] Phase changes are subtle, difficult to recognize, and are the times

[27] Slywotzky, A., *Value Migration*, 1996.
[28] Ibid.
[29] Eisenhardt, K.M. & Brown S.L., *Time Pacing: Competing in Markets That Won't Stand Still*, 1998.

of greatest vulnerability. Not knowing which phase your business design is in can lead to unexpected collapse since management objectives have to change along with the business design's life cycle.[30]An added difficulty is being prepared to a multidirectional value migration. When it occurs value migrates from an integrated base towards several different new types of business designs simultaneously putting the flexibility of the business design to great test.

On the other hand transitions between phases also present the greatest opportunities for new value growth. A relatively similar pattern to value migration could be an industry shakeout. When a major change in an industry's technology, or technological discontinuity, makes previous processes and know-how obsolete, a seismic-shift can occur.[31] That syndrome is common to mature industries that have enjoyed years of protected prosperity resulting from isolating mechanisms. A major problem to overcome is, in these terms, the belief that it can not happen to us. The uncertainties inherent in a recently turbulent industry forces firms to develop a sense of detecting early signals and rely on a number of plausible outcomes or scenarios. For well-positioned companies, looming shakeouts are opportunities to stabilize the industry and gain market power.[32]

Decisions made at the moment of transition to the second phase, value stability, affect how long lasting and profitable that period will be (from Phase I to Phase II). As a business design moves from stability to value outflow (from Phase II to Phase III), institutional memory limits an organization's ability to detect and respond to the need for change. Attempting to reverse the flow once the outflow phase is engaged, is usually too late.[33]

[30] Slywotzky, A., *Value Migration*, 1996.
[31] Day, G.S., *Strategies for Surviving a Shakeout*, *Harvard Business Review*, March-April, 92- 102, 1997.
[32] Ibid.
[33] Slywotzky, A., *Value Migration*, 1996.

The migration of value towards new stages of industry not only requires the lucidity to evaluate ones position within that framework but also the ability to manage the migration of capabilities. The location of the most powerful factors that defines the capabilities and disabilities of organisations also migrates over time: from resources towards visible, conscious processes and values, and ultimately corporate culture. When the problems and factors facing an organisation change but the capabilities have come to reside in processes or become embedded in culture, change can become extraordinarily difficult.[34] Consequently, flexible organisations with a sharp ability to capture early signals and adaptively rethink the firm's conditions have better prerequisites of surviving and keep a leading position.

3.3 Value Chain and Value Network

In addition to the industrial development, it is essential to grasp a firm's market structure as a network of value creating companies. A firm's internal value chain disaggregates it into its strategically relevant activities and is embedded in a larger stream of activities called the value network. In order to gain and sustain competitive advantage it is not sufficient to focus only on a firm's value chain but to understand how the firm fits the overall system. Suppliers have value chains that create and deliver the purchased inputs used in a firm's chain, thus influencing the firm's performance in many ways. In addition channel activities have a further impact on the value finally delivered to the buyers value chain. A firm's product eventually becomes part of its buyer's value chain, which determines the role of the product and the buyer's needs.[35]

The value network, also called value system, includes the sum of all activities that gives utility and benefit to the customer. It provides us with an effective overview on how different actors are related through the value adding process. A central feature

[34] Christensen, C.M., *The Innovator's Dilemma*, 1997.
[35] Porter, M., *Competitive Advantage: Creating and Sustaining Superior Performance*, 1985.

is figuring out were value is being created and what portion of it a firm can actually stand for and benefit from. The ability to claim that value will depend on the balance of forces between the firm, its customers, its suppliers, and its competitors.[36]

Traditionally the value network is built upon the physical and temporal sequences of the value creation process in its whole:

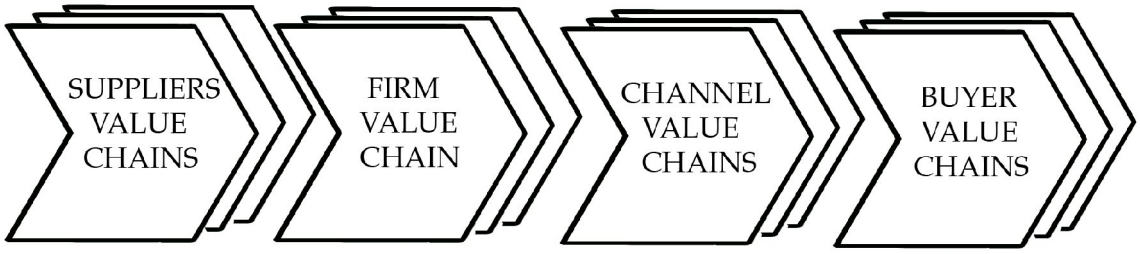

Figure 7: The Value Network [37]

A mobile operators industry value network could for example be illustrated as following:

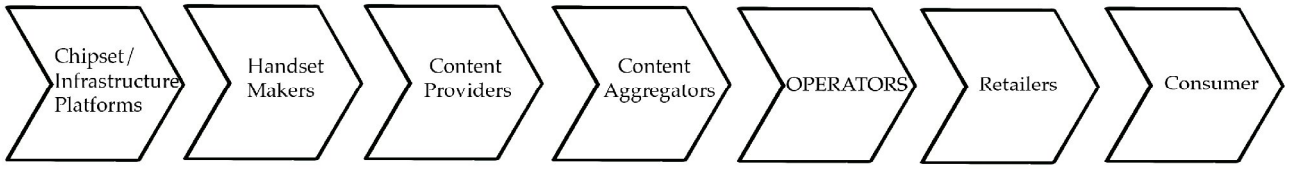

Figure 8: Operators Value Network [38]

Often the real value chain is quite different from the way a company's businesses and operations are physically structured or organised. The value chain is more expansive in concept than the supply chain, which merely provides a transactional

[36] Porter, M., *Competitive Strategy*, 1980.
[37] Porter, M., *Competitive Advantage: Creating and Sustaining Superior Performance*, 1985.
[38] Adapted from: Helin, J., TeliaSonera, *Challenges for the Future Mobile Operator Consumer Business*, mBusiness Conference, Jun 23-24, 2003.

end-to-end connectivity for a company with its vendors and its customers.[39] Other ways of conceptualizing the overview of an industry are less linear and static, but more focused on the dynamic interaction and interdependence of value creation. In today's fast changing competitive environment, strategy is no longer a matter of positioning a fixed set of activities along that old industrial model of value chain.[40] For companies characterized by intellectual capital, complement products and technologies, it is more suitable to apply models such as value constellations than traditional value chain analysis. [41]

The concept of value networks deals with the context within which a firm identifies and responds to customers' needs, solves problems, procures input, reacts to competitors, and strives for profit.[42] Moreover, the key strategic task is to reconfigure roles and relationships among a collection of actors- suppliers, partners, and customers- in order to mobilize the creation of value by new combinations of players.[43]

Within a value network each firms' competitive strategy, and particularly its past choices of markets, determines its perceptions of the economic value of a new technology.[44] These perceptions, in turn, shape the rewards different firms expect to obtain through the pursuit of sustained technological advantage and disruptive innovations.[45] Therefore, in order to attain the optimal benefits from a changing value network, firms need to be clear on those perceptions and its internal value chain. However, there are yet no universal guidelines on how to cope with these challenges.

[39] Bhaktavatsala, C., *Three Models to Make Your Company Mega,* Businessline, Nov 15 2005.
[40] Normann, R. & Ramirez, R., *From Value Chain to Value Constellation: Designing Interactive Strategy,* Harvard Business Review, Vol 71, Iss 4, 1993.
[41] Cartwright, S.D. & Oliver, R.O., *Untangling the Value Web,*Journal of Business Strategy, 2000.
[42] Dosi, G., *Technological Paradigms and Technological Trajectories,* 1982.
[43] Normann, R. & Ramirez, R., *From Value Chain to Value Constellation: Designing Interactive Strategy,* Harvard Business Review, Vol 71, Iss 4, 1993.
[44] Christensen, C.M., *The Innovator's Dilemma*, 1997.
[45] Christensen, C.M. & Rosenbloom, R.S., *Explaining the Attackers Advantage,* 1995.

3.4 The Blinders of Dominant Logic

Many prosperous industries and companies are often passive in terms of finding new ways of earning profits, especially when the revenues and margins are high and constant.[46] Essentially, the theory of blinders of dominant logic, argues that the dominant logic embedded in an organisation or industry may keep it ahead of a market but it also acts as a blinder to peripheral vision. Managers need to look beyond the borders of their industries and markets to find new opportunities and rethink the dominant logic, allowing traditional assumptions about value creation to be reassessed.[47]

The basic premise of the old industrial paradigm is that products and services are the basics of value. The producer predetermines products, so the company decides what to produce and what not to produce. The implication is that the end-consumer represents the demand for what a company can offer. When value is transferred from the company to consumers there are multiple approaches to value extraction at the point of exchange. The manifestation of this view is that the market is a demand target for the company's offering.[48] A new logic for value creation is emerging based on co-creation of value and the fact that value is embedded in personalised experiences.

[46] Prahalad, C.K, *The Blinders of Dominant Logic*, Long Range Planning Vol 37, 171-170, 2004.
[47] Ibid.
[48] Ibid.

Traditional Assumptions Of Value Creation	New Assumptions Of Value Creation
Value is exchanged between the firm and a customer. Value is created by the firm.	Value is created at the point of exchange. It is co-created by the consumer and the firm.
Value is embedded in products and services; therefore innovation is about products and services.	Value is embedded in experiences: products and services are carriers.
Value chain represents the value creation process.	Experience fulfilment webs are not a sequential and linear value chain.
Innovation is about technologies, products, and process.	Innovation is about experiences; technologies/products/processes are critical but not the goal.
Customers have a "buy" or "not" buy choice and managers are there to persuade them.	Customers make the key decision and the associated trade-offs.

Figure 9: The Competing Frames of Value Creation[49]

Recent findings are moving away from the old industrial model that sees value as being created from products and services, to a new conception where the sum customer experiences is the central point. Firms need to look beyond the offer itself, and optimize the customer's total value of the product's use even if the current sales are satisfying. As presented in the model above, the theory of blinders of dominant logic constitutes a move from a set of traditional assumptions of value creation towards new ones.[50]

Taken as a whole, the theory of value migration, the changes of value network, and the implementation of new assumptions, are all about firms need to be conscious of changing conditions. In order to survive and prevail in an industry and a market, firms also need to be adaptable and renewable in the way they do business, having taken important internal and external facts into consideration. As a result most or all

[49] Adapted from Prahalad, C.K., *The Competing Frames of Value Creation*, p.173.
[50] See Figure 9

of a firms interconnected key areas are affected, which leads us assuming that shaping and designing an appropriate business model is absolutely central.

3.5 Business Models

There have been numerous attempts to create schema for classifying the various types of business models seen in practice, particularly in relation to the Internet.[51] A common understanding is that the business model concept is used very often but defined in many differing ways. Cherian identified at least 33 business models, Applegate classified 22 Business Models and Timmers presented 11 specific business models.[52] Taken literally, a business model is a model of an existing business or a planned future business – a simplification of the complex reality.[53] This could be defined as "an architecture for the products, services and information flows, including a description of the various business activities, their roles and the sources of revenue".[54]

A business model adapted for our research could be disposed in the following four distinguishing components each covering central elements answering specific questions: [55]/[56]

1. Value Proposition:

   What value does the business offer its stakeholders or customers? A useful way to think about value proposition is from the intended

[51] Rappa, M.A., *The Utility Business Model and the Future of Computing Services*, IBM Systems Journal 43, 2004.
[52] Hedman, J. & Kalling, T., *The Business Model: A Means to Understand the Business Context of Information and Communication Technology*, 2001.
[53] Schubert, P. & Hampe, J.F, *Business Models for Mobile Commuities*, 2005.
[54] Timmers, P., *Business models for electronic markets*, 1998.
[55] Stähler, P., *Business Models in the Digital Economy*, Original title: *Geschäftsmodelle in der digitalen Ökonomie*, 2001.
[56] Chesbrough, H. & Rosenbloom, R.S., *The Role of the Business Model in Capturing Value from Innovation*, 2002.

customer's point of view.[57] What customer problem is the business solving? And how big a problem is that to the customer?

2. Market Segment:

   What does the company sell and to whom? The business model must target a group of customers and have an appealing proposition in accordance to the intended segment.

3. Value Architecture:

   Where (which actor) and how (what process) is value created through the value network? What position does the company have within the value network and how big portion of value can it claim?

4. Revenue Architecture:

   Where and how do profits accrue? How are costs and benefits shared in between multiple players interacting jointly to offer the product or service to the customer? Defining the architecture of the revenues implies fundamental issues such as how a customer will pay, how much to charge and which set of payment mechanisms are appropriate.

The main purpose of applying a business model to a mobile operator and its industry is to understand and analyse the fundamental aspects of how they currently operate and in which directions the evolution will go. A closely related alternative to business models is that of business design.

The term business design corresponds to the fingerprint of the way a company does business: the customers it chooses to serve, the value proposition it offers, the profit model it employs, the scope of activity it engages in, the form of strategic control it develops to protect profits and customer relationship etc. This is the totality of how a company selects its customers, defines and differentiates its offerings, defines the

[57] Chesbrough, H. & Rosenbloom, R.S., *The Role of the Business Model in Capturing Value from Innovation*, 2002.

tasks it will perform itself and those it will outsource, configures its resources, goes to market, creates utility for customers, and captures profit. The comprehensive system of activities and relationships represented by a company's business design is the foundation of value creation.[58]

Whether one chooses to use a business model or a business design concept, it is its definition and choice of primary components that matter the most. A central starting point is that a radical change of strategy means changing the entire business model.[59] The latter is in other words fundamental for any firm and supposedly applicable to research concerning mobile operators and technological evolution. For that matter it has been claimed that a mediocre technology pursued with a great business model may be more valuable than a great technology in a mediocre business model.[60] Consistently, the components of the adapted business model above handle the central issues related to the end-customer and therefore need to be looked upon more precisely.

[58] Slywotzky, A. & Baumgarter, P., et.al., *Are you enjoying globalization yet?*, Journal of Business Strategy Vol.27 NO.4, 2006.
[59] Upton, D.M. & McAffee, A.P., *A Path-Based Approach to Information Technology in Manufacturing*, International Journal of Technology Management 20(3/4), 2000.
[60] Chesbrough, H., *Open Innovation: The New Imperative for Creating and Profiting from Technology*, 2003.

3.6 Customer Services

3.6.1 Customer Activity Chain and Service Opportunity Matrix

As an alternative to the definition of a market in terms of products and services, companies can adopt a perspective based on customer activities and customer outcomes. Close to the previously mentioned assumptions raised by the "theory of the blinders of dominant logic", a customer's activity chain assumes that "what the customer considers value is never a product. It is always utility – that is, what a product does for him".[61] Just as the value chain it represents an end-to- end temporal sequence of logically related activities but goes further than the aggregated sum of value offered to the end customer. Instead it leads to defined customer outcomes used as a basis for defining the quality of the customer experience. An additional characteristic of the customer activity chain is that it crosses industry and product-market boundaries by withholding a perspective of the overall customer experience. In other words the conception is not disregarding any components of the business model but deals with them all from another point of view.

The concept has been applied in relation to the growth of companies through services and the opportunities at hand. Once companies are thinking in terms of the customer- activity chain they can classify new services along two dimensions: the focus of where growth occurs and how growth does occur. Merging those two focuses results in the service-opportunity matrix. [62]

[61] Drucker, P.F., *Management: Tasks, Responsibilities, Practices*, 1973.
[62] Sawhney, M., Balasubramarian, S. & Krishnan, V.V., *Creating Growth with Services*, MIT Sloan Management Review, Winter 2004.

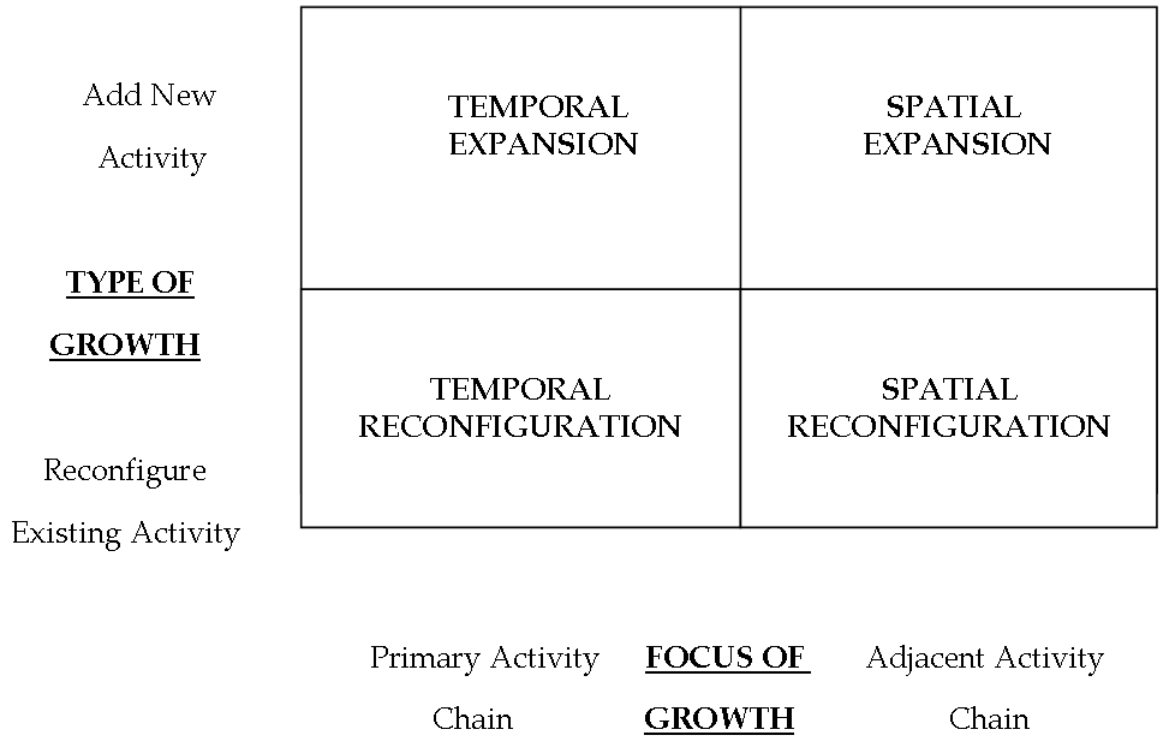

Figure 10: The Service Opportunity Matrix [63]

The Service-Opportunity matrix presented above acts as a blueprint that helps companies seeking service-led growth by redefining their markets in terms of customer activities and outcomes.[64]

A temporal expansion refers to the growth from services that add new activities to a primary activity chain. Key questions concerning how services can be added in relation to the core product are in this case highly important. When temporal expansion occurs firms need to figure out whether the new services should precede, follow, accompany, update or augment the core product?

Growth through temporal reconfiguration on the other hand induces a change of the structure and control of activities within a primary activity chain. The border

[63] Sawhney, M., Balasubramarian, S. & Krishnan, V.V., *Creating Growth with Services,* MIT Sloan Management Review, Winter 2004.
[64] Ibid.

between the firm's services and those made by the customer is moved. Managers must understand which capabilities are central to their own business, core activities, but peripheral to those of their customers, non-core activities, and decide what the company can do better than its customers in terms of cost, speed, quality or agility.[65] The acquired knowledge serves then as a basis for decisions related to customization and the attribution of different roles in the process.

Through spatial expansion companies add new services to an adjacent opportunity space that is not typically part of the primary activity chain. In terms of customer base, companies need to think about the connection and the dimensions linking the primary and adjacent activity chains when engaging in spatial expansion. Is there a need for shared activities or can they overlap along the firm's capabilities and reputation?

A spatial reconfiguration also applies to an adjacent activity chain but refers to services that change the structure and control of the adjacent chain. A careful analysis of how the relationship between a company and its customers in the primary activity chain can be applied in other contexts i.e. other industries or new markets of interest. A spatial reconfiguration requires therefore well-founded reflections regarding brand management, product bundling and customers buying habits.

There are three types of risks implied in the growth or shift of services: The capability risk, assessing the internal factors of importance, the market risk, evaluating the potential of reaching broader customer bases, and the financial risk which analyses

[65] Moore, G., *Living on the Faultline: Managing for Shareholder Value in Any Economy*, 2002.

future margins and profits. They respectively tackle the following basic issues: ”Can we do it?” “Will the customers be attracted?” and finally, “Can we make money?” [66]

3.6.2 Customer as Innovator

Also using a customer-based perspective, an alternative way of looking upon growth through services is placing the customer as an innovator. That theoretical contribution underlines the customer’s central position in terms of designing an appropriate business models.

Traditionally, suppliers have been taken on most of the work and responsibility of product development.[67] The results are then costly and time-consuming iterations between the supplier and the customer to reach a satisfactory solution. Most often the solution is created within the logic of the company while the need and demand lies in the customer. According to the customer as innovator approach a supplier provides the customer with tools for personalizing the selection, design and development of a products application and specific features. This shifts the location of the supplier-customer interface and trial and error iterations to product development by the customer. The approach is meant to result in greatly increased speed and effectiveness.[68]

Thomke and von Hippel have identified three major signs that the industry may soon migrate towards a customer as innovators approach. [69]

1. The market segment is shrinking and customers are increasingly asking for customized products. As the firm tries to respond to those demands, the costs increase and it is difficult to pass those costs on to the customers.

[66] Sawhney, M., Balasubramarian, S. & Krishnan, V.V., *Creating Growth with Services,* MIT Sloan Management Review, Winter 2004.
[67] Thomke, S & von Hippel, E, Customers as Innovators – A new way to create value” Harward Business Review, April 2002.
[68] Ibid.
[69] Ibid.

2. The industry actors and customers need iterations giving feedback before they find a solution to the problem. Furthermore the actors are tempted to restrict the degree to which the products can be customized and the smaller customers must do with the standard products or find a better solution elsewhere. As a result customer loyalty starts to erode.
3. The industry actors use high-quality computer based simulation and rapid prototyping tools internally to develop new products. They also have computer adjustable production processes that can manufacture custom-made products. These technologies could be from the foundation of a tool kit that customers could use to develop their own designs.

Thus the customer as innovator approach is effective in the way that it solves a great part of a crucial difficulty firms are constantly facing. Thinking in terms of a collaboration of innovation and customization is even more effective for complex products since producers have less to investigate in terms of customer choice once a platform for co-creation of value is installed.

3.7 Summary

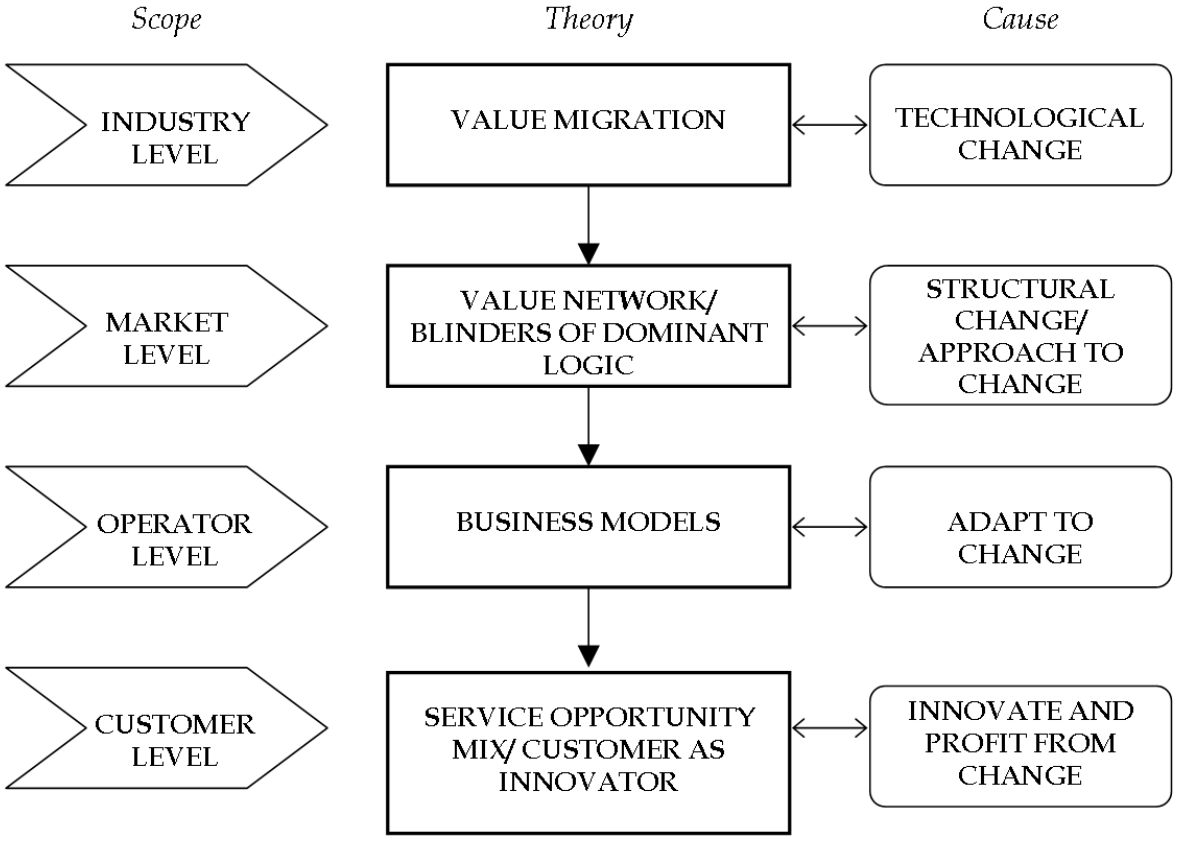

Figure 11: The Theoretical Base in 4 steps

Summing up the chosen theoretical base, there are varying views depending on which scope is treated, from which perspective and which priorities and goals are to be reached.

The value migration theory gives us a great insight on how to perceive an industry's evolution. During times of uncertainty due to technological change, establishing which stage an industry is currently in is even more difficult to pinpoint. On a more concrete level, thinking in terms of value chain and value network helps managers to separate internal functions from the market's structure and relate to close actors. Applied to the dynamics of a markets evolution, having a clear perception of that structure is even more crucial.

That being, companies may have a hard time grasping these conditions and finding a way to adapt in the best way. A business model analysis is therefore very helpful since it covers the key parts of business design in a rather simplified way. The creation or the remodelling of a business model still requires a deep understanding of the migration of value and the opportunities and risks involved.

Furthermore proactive firms having the ambition of becoming and remaining a leader, have the possibility to shift the internal emphasis towards a customer-based perspective using the service opportunity matrix theory and the customer as innovator theory. Those latter contributions can act as complementary theory facilitating the understanding of value growth and migration through services. They may have the potential of creating unique value once the firm is configured to apply these approaches in a correct and effective way.

Finally, adopting an overviewing perspective could be a starting point providing the firm with a current state analysis in general. When in need of a relatively precise idea of what the future has in hold, a firm is then obliged to take a multitude of additional related factors into account. Facing future opportunities and risks is thus a question of different levels of scope that together constitutes a fairly complete theoretical base for better understanding and analysis.

IV. Empirical Material

The empirical part illustrates the collected data and is meant to provide an insightful overview of the industry and help us understand the reality of an operator's current and upcoming challenges. Combining the collected primary data with various comments and expertise from articles and other published material, the empirical base of this study attempts to grasp as many facets of importance as possible.

4.1 Introduction to the Empirical Material

The empirical chapter is presented through three main areas of empirical material. The first one undertakes the competition of emerging networks and more precisely investigates which are the characteristics and implications that might determine the future of mobile networks.

Furthermore, the collected empirical material deals with the multitude of mobile actors involved in the study. After covering traditional mobile operators' sources of income, market segments and current action, we then present the situation of new entrants as wireless providers and IP-providers.

Finally, empirical material concerning mobile devices, services and applications is presented. This brings up the current content and their providers within the industry, followed by describing the most hyped content as mobile TV and advertising. At the end we also discuss the security matter in the telecom industry.

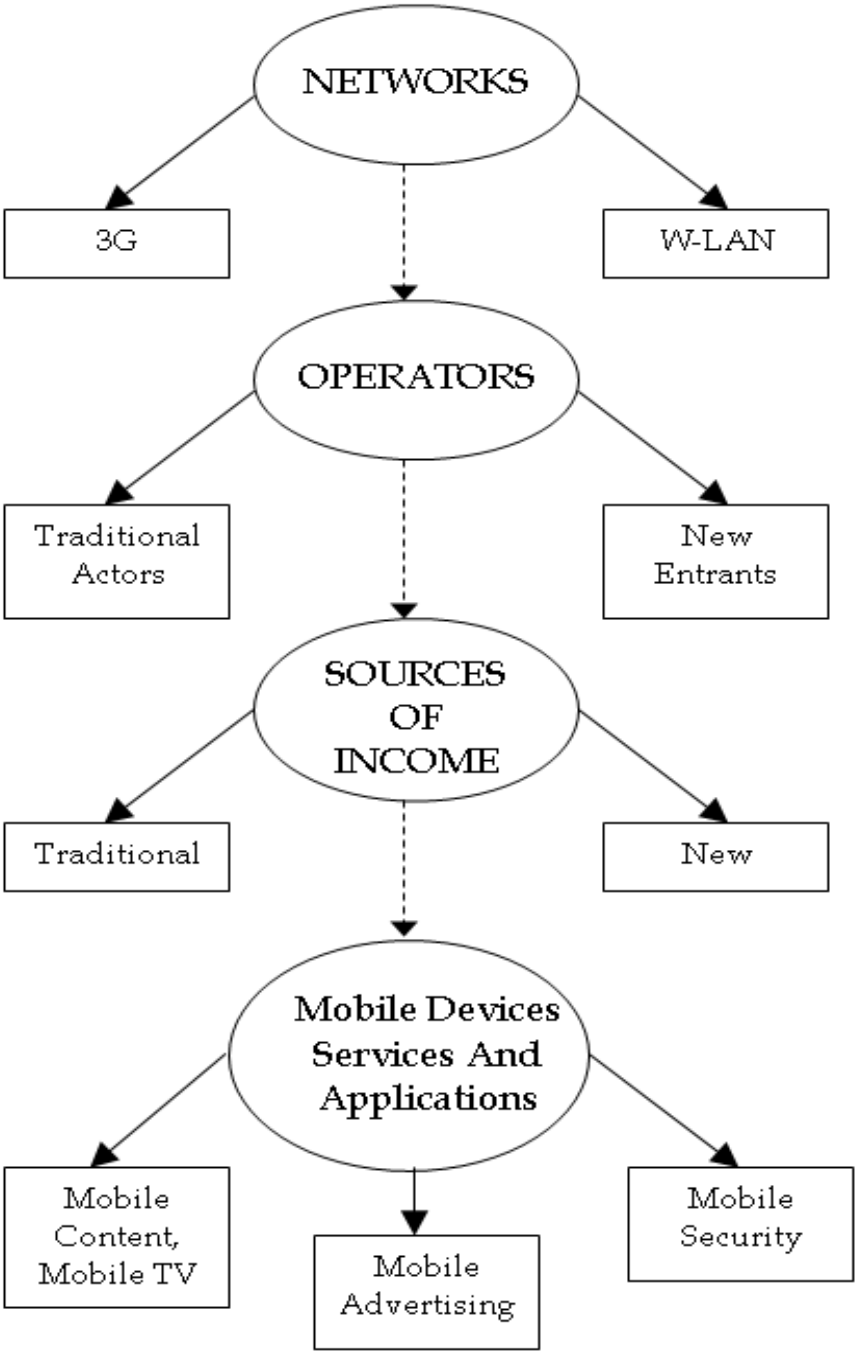

Figure 12: The Empirical Material's Disposition

4.2 The Competition of Emerging and Existing Networks

4.2.1 Technical Overview of Mobile Networks

A phone call made from a mobile terminal is composed by a radio technology where electrical signals are transmitted through electromagnetic waves. In the beginning of the mobile era, calls and communications were made through analogue networks. Along with the fast evolution of Internet, the number of users has been growing and communications have become more complex, notably with video calls and other innovative features. The need for higher data speed over mobile networks has consequently become a compelling need. The new digital generation mobile system that was developed and implemented is referred to as 3G.[70] Today we are facing 3,5 G, 4 G and new emerging technologies such as WiFi and WiMax with even higher capacity.

The oldest mobile phone system uses the Nordic standard NMT (Nordisk Mobiltelefon) and was originally constructed only for speech being incompatible with other services. The NMT-450 system used a low frequency and had therefore a larger national coverage than modern, higher frequency technologies. The NMT-900 was developed later on and uses the same frequency as GSM.[71]

The GSM (Group Special Mobile) network is the most common mobile phone system and was originally developed as a standard European network also named 2G or "second generation system". The GSM systems major comparative advantage to new network such as 3G and WiFi, is its area coverage. It was built for the 900 MHz frequency areas, like the analogue NMT 900 network. When the number of users increased in the GSM network, developers had to find new frequency areas to employ such as 1800 MHz or GSM 1800. The 3G-network uses a higher frequency;

[70] www.wikipedia.com Dec 2006.
[71] Per Månsson and Johan Jobér, Nordisk Mobiltelefon AB, Dec 8 2006.

over 2000 MHz and signal losses due to obstacles between the receiver and the transmitter are therefore more common. This is why 3G requires more base units within a couple of kilometres compared to GSM that covers broader areas.[72] To some extent the GSM networks capacity also enables the use of added-on services and larger data traffic but does not fulfil the current markets demand.[73]

3G, the third generation mobile phone system, also called the UMTS-network, offers the possibility to work and communicate with more data at an adapted speed. The 3G-system provides a faster speed (up to 2Mb/sec) than the 2G-system and is useful for phone- and video calls, sending and receiving still or agile photos as well as other advanced services.[74]

WiMax, defined as Worldwide Interoperability for Microwave Access, is the next generation of W-Lan and provides a broad range of bandwidth over large areas. WiFi is its short-range counterpart (approximately 10-50 of meters) and is used in metropolitan areas by many users. WiFi hotspots are typically installed in coffee shops, hotels, airports It provides connectivity between network endpoints without the need for a physical line.[75]

4.2.2 Network Standards: 3G and W-Lan

During the month of November 2006, the mobile operator 3 attracted a lot of attention in Swedish newspapers. The reason was the opening of the new network 3G-Turbo, in co-operation with Ericsson.[76] It constitutes an innovation enabling faster wireless broadband both for computers and mobile phones reaching up to 3,6 megabit/s. The connection will already in the beginning of 2007 be improved to a

[72] www.bemi.se Dec 2006
[73] www.pts.se Dec 2006
[74] www.pts.se Dec 2006
[75] www.wikipedia.com Dec 2006
[76] www.di.se , Nov 6 2006.

level of 7,2 megabit/s.[77] Shlomo Liran, CEO of the 3 group, talks about 3's third revolution on the Swedish market. The first one was when 3 succeeded to make customers price-conscious, the second was the transformation of the mobile from a "talk-machine" into a "music-machine" and finally 3G-Turbo, high-speed wireless broadband.[78]

Aside of the progressive installation of 3G-Turbo's infrastructure, a huge participation and interest from competing actors is nurturing the evolution W-Lan or other similar wireless networks. As a result, the telecom industry originally seen as an oligopoly, finds itself radically confused and the future leaders are very much uncertain. "Everybody is participating, not just 3 or 4 operators per country which is a clear step towards the Internet model".[79]

During the WiMax World Conference in 2006, supporters of the new technology claimed they would challenge existing operators with all-IP networks and mobile broadband.[80] Several consultants have expressed the complexity of predicting an overall development and shown their concern towards the future. Bengt Nordström, professor at KTH@wireless, is one of many others to share that point of view: "If you had asked me five years ago, I would have answered that 60 to 70% of all wireless data-traffic today would be over mobile networks controlled by big operators like Telia. But I was completely wrong; today the mobile operator's part of wireless data-traffic is too small to be measurable. Instead, the big volumes of data are transferred using WiFi-networks controlled by many small actors".[81]

[77] "Premiär för turbo 3G i Sverige" NyTeknik Nov 15 2006.
[78] "18 miljarder borta - nu eller aldrig för Tres vd", Veckans Affärer, Nov 9 2006.
[79] "Hon är telejättarnas mardröm", Bengt Nordström, Veckans Affärer Aug 31 2006.
[80] "New WiMax raise the stakes", Cox J., Network World, Vol.16 - Iss. 23, Nov 10 2006.
[81] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.

4.2.3 Pro and Cons of Network Standards

One of the principal disadvantages of WiFi is its lack of mobility since it is hard to use in movement even though it is wireless. Andreas Lundin, Sales Manager for mobile phones at Nokia Scandinavia, points out that: "Although approximately 88% of mobile calls are made in a fixed location, 90% of all mobile data will go over W-Lan".[82] The W-Lan technologies, WiFi and WiMax, are easy to use and progressively more accessible, but have also the significant benefit of being less expensive than 3G.[83] Bruce Gustafson, director of marketing for WiMax at Mortel, agrees on the financial aspect "We can deliver for one-tenth of the cost per bit 3G operators have today"; "A hotspot costs today a couple of hundred euros, which is a considerable difference to the 100 000 euros needed for a 3G mobile-phone station.[84]

WiMax has, because of the reasons mentioned above, become the solution that is being most hyped. The idea is that providers will create large metropolitan wireless networks so people can use the same device wherever they are and have access to voice and data services. Advocates admit that such networks are still a few years away, but they believe the technology itself will eventually be fit for purpose.[85]

Jan Nilsson at Labs2, brings up the issues induced with the potential expansion of W-Lan. He underlines that some operators and mobile phone producers consider the integration of W-Lan into phones as a complementary feature, but is problematic since there is an incompatibility of price structure in relation to the core product. In other words, a fully incorporated access to WiFi or WiMax would make it a non-public complement and users would have to be charged for its use. [86]

[82] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.
[83] Ibid.
[84] "New WiMax raise the stakes", Cox J., Network World, Vol.16 - Iss. 23, Nov 10 2006.
[85] The Mobile Internet" ; Mark Vernon, www.ft.com, Nov 16 2006.
[86] Jan Nilsson, Labs 2, Nov 29 2006.

In today's situation, WiFi applications are close substitutes to other networks in some city areas because they are far cheaper and provide full Internet access. In terms of availability, hotspots are continuously being installed in city areas, and will soon be a well-functioning wireless Internet provider.[87] The fact that city-centres and densely inhabited areas are the prime location for hotspots, threatens the source of income both for broadband and mobile operators since it is clearly the target environment for communications.[88]

From a broader perspective, Bengt Nordström claims that the GSM and 3G-networks will be complements to WiFi since the latter covers city areas while the large-scale networks cover less urban regions.[89] 3G will therefore be useful for those who are ready to pay for more mobility and a broader accessibility, urban and rural areas included, while W-Lan based technologies will serve smaller central areas of static use. [90]

Per Månsson, CEO of Nordisk Mobiltelefon, also thinks the future development will be very tough for mobile operators, especially for those who today are specialized in city areas and are unable to create uniqueness competing with the emerging W-Lan operators.[91] Recently his company took over the NMT 450 network license from TeliaSonera. By remodelling and improving this network, Månsson claims that they will be able to offer a broad coverage and a high-speed connection for customers. By using the same standard as 3G on the old NMT network, Nordisk Mobiltelefon will offer similar speed and almost 100 % coverage area in Sweden compared to the 30 % of the operator 3. Their target will therefore be people with the specific need of broad coverage including remote and uninhabited areas. Their key customers are meant to be users that are out of reach from other competitors. According to Johan Jobér

[87] Jan Nilsson, Labs 2, Nov 29 2006.
[88] "Molnet över mobilmarknaden", Affärsvärlden, nr 45, 8 Nov 2006.
[89] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.
[90] Jens Zander, "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.
[91] Per Månsson and Johan Jobér, Nordisk Mobiltelefon AB, Dec 8 2006.

technical chief, CTO, at Nordisk Mobiltelefon, “it’s technically impossible” for 3 and other networks to match their offer. The factors of coverage and infrastructural development costs are therefore crucial. On the other hand their network will not be able to support many users at the same time, which is a compelling constraint.

Characteristic / Network	Capacity	Coverage	Speed
GSM	Average	High	Average
3G	High	Average	High
NMT 450	Very Low	Almost Perfect	High
W-Lan	Low	Low	High

Figure 13: Different Networks Characteristics

As described above, different networks exist, fit for different purposes and needs. Network with high capacity (in terms of data) can provide less coverage. On the other hand, low capacity networks have a broader coverage. It is obvious that the networks are suited for different purposes, but what will be the next network standard within an industry where the competition is emerging?

4.2.4 Future of Networks

Unlike Ericsson that believes in 3G-networks, Nokia is a great supporter of the future of WiMax. They consider it as a potential direct competitor to the 3G-networks, at least in some markets.[92] In a tech-update forum held in Stockholm December 2006, Nokia outlined that the 3G-network will probably become a general platform but that the other emerging networks shouldn't for that reason be neglected.[93]

On the other hand, Håkan Eriksson, technical chief at Ericsson, proclaims that, "WiMax will be terminated in two years; the technique will not be comparable to 3G-Turbo. And those who are waiting will miss the train." [94] Ericsson has a straight strategic line, underlining the advantages of the 3G-network. Ericsson spokesman Peter Olofsson, said that "Ericsson thinks the majority of mobile data will go through the 3G-networks."[95] According to Carl-Henrik Svanberg, CEO of Ericsson, it is a question of capacity. In a press conference in Tokyo he claimed, "The capacity of the 3G-network will lead operators to launch even more mobile services such as music features, movies and other media content".[96] The standard version of WiMax only enables people to use Internet and post e-mail, but the speed capacity will not be sufficient for handling music and video.[97] Besides it will not be so effective in fast motion, on a motorway for example, but more easily used in city traffic.

Per Månsson from NMT, brought up an advantage of the 3G-networks: "It is known to represent a great part of the data-traffic because of its many application domains ranging from informative media, through games and entertainment to music." An important factor is in this regard the promise of speed and mobility from the

[92] "Nokia satsar på mobil WiMax", Computer Sweden, Dec 20 2006.
[93] "Nokia satsar på mobil WiMax", Computer Sweden, Dec 20 2006.
[94] "Tre skärmar bildar Ericssons värld", Computer Sweden, Oct 25 2006.
[95] "Nokia satsar på mobil WiMax", Computer Sweden, Dec 20 2006.
[96] "Ericsson tror på 3G", Computer Sweden, Nov 17 2006.
[97] "WiMax bokstavligen på gång", Computer Sweden, Nov 17 2006.

operator. Offering a tailored set of products and services requires a certain level of quality that operators cannot afford to underestimate and take advantage of.[98]

Richard Woodward, Chief Financial Officer of 3 in Sweden, gave another optimistic view towards the 3G-networks. The possibility of another network to dominate or to become a standard is not according to him a major concern. “The quality of our network is relatively superior to WiMax at its current stage. In addition, operators compete on the basis of scale economies and will very surely do that in a greater extent in the future.” He added, that it is a question of return on asset and in that regard 3 has an advantage. Moreover, he claims that the expensive 3G licences are not to be thrown away which indirectly protects the near future of the network. In other words, emerging networks have a long way to go before being able to threaten the 3G-network since it is fully installed and already adopted by many operators.

3 is the main 3G provider on the Swedish market, though it exist a couple of mobile operator proposing different services and network access. In the following paragraph, we will give an overview of different current actors but also the new entrants using the mentioned emerging networks above.

4.3 Mobile Actors

4.3.1 Traditional Mobile Operators

4.3.1.1 Future Source of Income

The telecom market is a well-defined oligopoly where a few companies have licences allowing them to provide services and products. To this date, mobile operators still rely on their primary source of income being voice and text messaging.[99] Mobile operators tend to use the ARPU (average revenue per user), in order to calculate their income per user. It is the monthly revenue generated by a customer phone, pager,

[98] Richard Woodward, 3, Dec 5 2006.
[99] Richard Lindberg, Conveneer, Nov 2006.

etc. In mobile telephony, ARPU includes not only the revenues billed to the customer each month for usage, but also the revenue generated from incoming calls, payable within the regulatory interconnection regime.[100]

Nature of Income (2005)	Value (Millions SEK)
VOICE	15082
Text Messaging	1668
MMS	67,3
MVNO	458

Figure 14: Traditional Sources of Income[101]

The table above presents the total value of the major sources of income for the Swedish mobile operator market during 2005. Clearly the dominant part comes from voice services, and still constitutes an important source of revenue for mobile operators. An interesting point is also how low the incomes from MMS are.

Another important area of an operators activity is to let MVNO:s, Mobile Virtual Network Operator, pay for using part of the network. An MVNO is a company that does not own a licensed frequency spectrum, but resells wireless services under their own brand name. They are often famous brands attempting to enter the lucrative mobile industry. Sweden has a few number of MNVO:s but four of them are owned

[100] www.wikipedia.com, Jan 09 2007.
[101] www.pts.se, Nov 29 2006.

by the three major mobile operators. This strategy is especially put in place with a strong focus on marketing their offer in order to reach specific customer segments. To name a few examples, Tango (Optimal Telecom), is owned by Tele2 and has a primary focus on price-sensitive users. Halebop Mobile, is owned by Telia Sonera, and focuses on young user while Djuice and Glocalnet, are MVNO:s owned by Telenor , and focus on price-sensitive users

Started in 1999, Virgin Mobile is a great example of an MVNO and exists today in six countries around the world.[102] Other examples of MVNO:s are Tecso and EasyJet that have also engaged in renting themselves onto mobile networks. Both companies core business are far from the telecom industry but it illustrates the great possibility of an outside actor to enter and benefit from this market. Due to the popularity of starting up a virtual mobiles business, a Swedish company named Spinbox has specialized themselves in helping and starting virtual structures for companies. They propose a complete processes and systems to help packaging the services for the customer to use.[103]

Anders Staaf, Senior Consultant at Telemanagement thinks the presence of MVNO:s will probably increase and take a more important position along with the development of new networks within the next couple of years. The mobile market is currently stagnating and the competition is not as tough as before. Mobile operators have to find new sources of income which favours the introduction of new MVNO:s, focusing on famous brands like an eventual Apple operator.[104]

[102] http://www.virgin.com/gateways/mobile/, Jan 2007.
[103] http://www.spinbox.se, Jan 11 2006.
[104] Thomas Schiffer, Telia Sonera, Jan 12 2007.

4.3.1.2 Market Segments

In the table below we can observe some of the largest mobile operators market strategy in Sweden (2006).

Mobile Operator	Primary market-strategy	Secondary market-strategy
Tele2	Low-priced services and focus on young users.	They propose 3G-services in order to be part of the evolution.
Telia	Focus on older users, interested in good quality, broad access, and excellent service.	They lower the prices in order to meet the tougher competition.
3	Differentiation by profiling themselves as media- and entertainment channel.	They compete with low prices.

Figure 15: Operators Market Strategies [105]

As noticed 3 is the only service and media focused operator, and according to Shlomo Liran, it is profitable. "The most important is that we earn more money per user than our competitor, because we have three times more traffic in our network than our competitors".[106] Thomas Schiffer, a business analyst from Telia, believes the minute fees for voice will not decrease anymore since "the voice-service has almost reached its lowest possible price". Furthermore he is convinced that mobile operators

[105] Adapted from "Fallstudie om mobiloperatörers marknadsstrategier" by Tahghrid Hodroj, KTH 2006.
[106] "18 miljarder ska bort – nu eller aldrig för Tres Vd" Veckans Affärer, Nov 9 2006.

have to embrace more services at the same price. Instead of reducing the voice fee, they have to increase to a broader service offer. [107]

Anders Staff consultant at Telemanagement stresses the importance of segmenting the mobile industry. He discerns four possible customer segments based on age:

- First the teenage segment less than 20 years of age: They are very price-sensitive and represent the demand for various entertainment features as ring tones, games and music. They are heavy users of text messaging and MMS-services.
- A young adult segment from 20 to 25 is very focused on status. The killer features have to be the latest on the market and include impressive functions.
- Customers in need of business functions allowing them to report to the superiors, colleagues and employees compose the third segment, from 30 to 50 years of age. E-mailing and organizing features such as calendars or address books should be very effective and user-friendly.
- The fourth segment includes customers that are 50 years old and above. User-friendliness and simplicity are primordial, but the segment is not currently considered a central one.

Most probably a mobile operator can discern far more customer segments based on a multitude of other factors in a detailed way, but segmenting the customer base, will according to Anders Staff, become even more important in the future. The differences among customers will only be greater leaving operators facing a progressively more complicated analysis to work out.

[107] Thomas Schiffer, Telia Sonera, Jan 12 2007.

4.3.1.3 Current Actions

At the end of 2006 PTS (The Swedish post and phone agency) research revealed that the total revenues of mobile operators have increased by only 1 % from 2005 to 2006.[108] In reaction to those disappointing results, mobile operators have been locking-in the customers to their network using various methods. Bengt Nordström claims that historically their business model worked well, but they are scared to abandon it. Meanwhile operators are threatened by the new technologies that can take over.[109] To this date operators are trying everything to maximize their profits through the traditional sources of income since they know how profitable they are.[110] Richard Lindberg added, that operators are able to do so since customers are not aware enough of their options and do not know what they are actually paying for because of the complexity of the industry on one hand, but also the deliberately complicated offers operators have configured on the other.

Mobile operators are currently using fictive costs in order to reach greater income.[111] The access fee for a call has increased whereas voice-calls per minute are charged less. Swedish mobile operators earn approximately a total of 4 billion of Swedish kronor (SEK) per year, only from the aggregate of access fees. That represents 25% of the total income from voice calls. The mobile operators cost of the access fee is not even measurable in relation to the income, therefore fictive. Stefan Williamson, Chief of Market Analysis at PTS explains that the long-term trend is increasing access fees.[112] The media has brought up other income strategies used by mobile operators. Normally you pay per minute, but some operators charge you per 10 seconds. In result it will be more expensive if you called 1 min 15 with the second alternative

[108] www.pts.se Feb 2007.
[109] ”Hon är telejättarnas mardröm”, Veckans Affärer, Aug 31 2006.
[110] Richard Lindberg, Conveneer, Nov 2006.
[111] “Mobiloperatörer tjänar miljarder på fiktiv kostnad“, Computer Sweden, Dec 29 2006.
[112] Ibid.

than the first one.[113] This tool is actually used by mobile operators to compensate for the low minute prices.

Modest strategies have been put in place to deliver an alternative solution to the uncertain future.[114] Jens Zander from KTH@wireless stated that the modest initiatives taken by operators must be seen as experiments or complements to the traditional incomes. Moreover the current price structure of new services result in far too expensive offers that are not appealing to a majority of customers.[115] However, the Norwegian telecom operator Telenor took one of the most offensive strategies.[116] In august 2006, they made a deal with the operator The Cloud, in order to provide their customers with a wide access to a WiFi-network. The service is primarily focused on corporate customers, and offers a favourable connection solution.[117] It enables customers to use their laptops and mobile phones through any of the 7500 hotspots of The Cloud around in Europe. Roald Sandén, Nordic Manager of The Cloud, commented the deal by saying: "We are going to grow by making things easy, and our customers will experience the service as a complete Telenor service. The value is in a clear division of roles, we build networks, and Telenor can focus on products and customer-relationship".[118] The American company Verizon has opened up for its business customers 33 135 hotspots worldwide.[119] It shows that several operators have the capacity of providing new wireless networks worldwide and implement new strategies.

[113] "Så smyghöjs din mobilavgift", Computer Sweden, Jan 5 2007.
[114] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.
[115] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.
[116] Ibid.
[117] www.telenor.se, Jan 2007.
[118] Ibid.
[119] "Skype utmanar i Stockholm", Computer Sweden, Mars 16 2007.

4.3.2 New Entrants

4.3.2.1 Wireless Provider

Along with the expanding presence of WiFi-networks, users have witnessed an increasing entrance of wireless providers.[120] The Cloud, for example, which is the biggest wireless provider today, has a capacity of 10.000 hotspots. A clear competitor is undoubtedly the free-based provider Fon, giving away wireless routers for free in order to reach a wide number of users.[121] They have already 110 000 users worldwide and are interestingly owned in part by Google and Skype. In late 2006, Nokia launched mobile phones enabling users to call on 2G, 3G and WiFi-networks.[122] Probably in a couple of years, WiFi-phones will be used just as mobile phones are today.[123] "In five years, I won't see any difference between the different platforms, all communication will be IP-based" says the Nordic Manager of The Cloud.[124] The expansion of hotspots has recently speeded up in Stockholm. Skype built up to 100 WiFi surf zones, providing free Internet access. At the same time the Clue installed 125 hotspots, in Stockholm, though the customer has to pay per hour.[125]

4.3.2.2 IP-Providers

The entrance of Internet in the telecom industry enables a large number of IT and Internet companies to take part of the incomes from the traditional telecom actors. Especially since they developed IP-based software to reach a larger customer-base. [126] "The IT-market's interest in telecommunication is above all the access to more registered users which can increase advertising incomes", said Per Blom, telecom

[120] "Molnet över mobilmarknaden", Affärsvärlden, nr 45, Nov 8 2006.
[121] Ibid.
[122] "Molnet över mobilmarknaden", Affärsvärlden, nr 45, Nov 8 2006.
[123] Ibid.
[124] Ibid.
[125] "Skype utmanar i Stockholm", Computer Sweden, Mars 16 2007
[126] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.

responsible at Cap Gemini Sweden.[127] Experts believe that the business model that exists on the Internet will shake out the telecom industry very fast. [128]

At the end of 2006, the mobile operator 3 announced the launch of the X-series, two mobile phones constructed by Nokia and SonyEricsson, providing several features especially Skype, the most predominant VoIP application.[129] Skype enables users to call between each other for free, provided that the caller and the receiver are members of Skype. Another aspect of the deal is Skype's worldwide and enormous customer-base, around 136 millions uses Skype today.[130]

Among the companies selling VoIP, there are established telecom operators as well as small actors with almost invisible businesses. Skype is probably the most famous IP-application, but there more advanced versions offering VoIP. Cellip, for example, proposes for the same price as a fixed phone call, a software application enabling calls for low call-prices from a mobile phone.[131] The application can shift between different networks, for example from the home to the office's wireless broadband. It can also easily connected to public networks with a simple log-in access. To grant the customer the "always on" feature, the offer can combine a 3G- access with an added-on independent IP-service. In order to retain the customer, the mobile operator can use the IMS-technology, permitting a lock-in of their customer with a complete solution uniting 3G- access, home-access and IP-solution. This technology is to this day under ongoing development by the front leaders of the telecom sector including Ericsson and Nokia.[132]

[127] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.
[128] "En enveten entreprenör", Computer Sweden, Dec 1 2006.
[129] "Tre utmanar på mobilt Internet", Computer Sweden, Nov 17 2006.
[130] "3 satsar på fast pris för mobil Internet", www.svd.se, Nov 17 2006.
[131] "Ring billigare med IP", NyTeknik, Nov 29 2006.
[132] Ibid.

Other IP-applications have appeared on the market, like Rebtel. It consists of software that allows the user to call for very low cost international calls from the mobile phone.[133]

As brought up above, traditional Internet actors are currently and successively entering the telecom industry. Traditional mobile operators will not be alone proposing voice and other telecom services, and will have to adapt their conservative business thinking. Katja Ruud, Telecom Analyst from the well-known consultant firm Gartner pronounced that "As an example TeliaSonera missed a long-term strategy to handle market changes. Operators probably will not go into bankruptcy but they have to adjust their business model when the definition of what an operator is will change".[134] Thus it evident that operators need to find new sources of income and focus on which servicees will be decisive in the future.

4.3.3 Convergence of Multiple Activities

Due to the decreasing prices off calls, operators have to compensate their lack of incomes by lock-in the customer into their networks.[135] Triple Play is an initiative from operators in that regard. The leader in Sweden is ComHem, proposing TV, telephony and Internet, all in just one network.[136] Telia also launched their Tripleplay to compete against ComHem in November 2006.[137] Telenor is another good example of mobile-operators merging three services. "The customer can benefit from getting three services from one and only provider", says Anders Jensen, Market Director and Business Manager at Telenor.[138] They get one bill and will be not charged for the fixed telephony. Tele2 is also planning to enter this market, after their acquisition of Eon Internet broadband service.[139] Typically for a changing industry such as the

[133] "Hon är telejättarnas mardröm", Veckans Affärer Aug 31 2006.
[134] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.
[135] "Bredband, TV, telefoni från samma håll", www.dn.se, July 17 2006.
[136] Ibid.
[137] "Telia ska spränga 100-miljardersgränsen", Computer Sweden, Nov 17 2006.
[138] www.telenor.se, Oct 19 2006.
[139] "Bredband, TV, telefoni från samma håll" www.dn.se, July 17 2006.

mobile telecoms, the future is always close. Mobile operators start to talk about Quadruple-play, including the all four services.[140] (Mobile phone, TV, Internet, Broadband)

During Cebit, the famous IT-fair in Hanover March 2007, the catchword "Breaking Free" was spread as a result from the partnership between Nokia and Siemens called Hiptach Mobile Connect. The collaboration resulted in a technique enabling the user to walk and shift from different wireless networks such as W-Lan, GSM and traditional fixed home network. Not only does it function on different networks customers still have one phone and one unique number.[141] Telenor will soon launch this technique in their network, called the uma-technique. The call will be directly taxed at a lower cost and will technically replace the fixed home phone.[142]

4.4 Mobile Devices, Services and Applications

4.4.1 Mobile Devices

In 2010 Symbian's Nigel Clifford believes that the mobile phone will have turned into "a remote control for life", broadband or WiFi web browsing, listening to music, watching TV, navigating to the next meeting, scanning in business cards, paying for train tickets, monitoring jogging distances and calorie use, making cheap VoIP calls or turning on a personal video recorder at home if they are running late.[143]

In late 2006, Nokia launched mobile phones enabling the user to call on 2G, 3G and WiFi-networks.[144] Within a few years, WiFi-phones will probably be used just as mobile phones are today.[145] But a recent survey by Hostway, a website-hosting company, found that 73 % of users still do not access the Internet from their mobile

[140] "Bredband, TV, telefoni från samma håll" www.dn.se, July 17 2006.
[141] "Hetast på Cebit – skarvlösa nät", Computer Sweden, Mars 16 2007.
[142] "Nokiastrul sinkar Telenors bredbandsmobil", www.di.se, Feb 12 2007.

[143] "Mobile devices: What are we meant to do with all this", www.ft.com, Oct 4 2006.
[144] "Molnet över mobilmarknaden", Affärsvärlden, nr 45, Nov 8 2006.
[145] Ibid.

device. Many concluded that the pages load too slowly for small screens, making it difficult to navigate websites.[146] People are demanding more from their phones and the actual relevance of mobile services. They want features and flexibility: play music and video, synchronise with calendars, PDA:s to include GPS, laptops that come with built in 3G modems.[147] But how many features can you usefully cram into a single device without making it too big and too heavy, contorting features to fit them in, or overloading the battery?[148]

In fact the current dilemma with the emerging technologies and applications is the mobile devices restricted capabilities. Even if today mobile phone has a large memory capacity, it is technically difficult to manage whole applications due to example a limited number of buttons, battery power and small screens. Besides the user is constrained to learn more new features, because new services and applications are constantly being launched. For example, part of the difficulty of fitting a camera into a phone is the cost a higher resolution camera adds to devices in a very competitive market. Mobile operators are still hoping that picture messaging will prove to be as lucrative as text messaging, but have little interest in higher resolutions because the images are too large for picture messaging.[149]

Mobile e-mailing and mobile web surfing are key features; they are not new but are becoming more popular, especially now that HSDPA (high-speed downlink packet access) gives speeds close to broadband capacity. 66% of corporate users have mobile phones that can handle e-mails.[150] In the same study 54% of the respondents expect they will manage mobile e-mail in their phones during 2007.[151] Even if Swedish mobile operators have not really embraced the new technology HSDPA, mobile

[146] The Mobile Internet“, www.ft.com, Nov 16 2006.
[147] “Mobile devices: What are we meant to do with all this? “, www.ft.com, Oct 4 2006.
[148] Ibid.
[149] “Mobile devices: What are we meant to do with all this? “, www.ft.com, Oct 4 2006.
[150] “Nu vill alla ha mobil e-post”, Computer Sweden, Nov 27 2006.
[151] Ibid.

phone producers have made their phone technically compatible to this new, faster network.[152]

Along with the importance of content, some hardware producers and Nokia have made their devices more "service-minded". HP, Mio and Benefon have "smartphones" with a built in GPS (Global Positioning System) service. They allow GPS navigation, which in turn has many methods of application using instant geographical tracking and positioning.[153] Sony Ericsson has applied for a patent of a mobile phone enabling people to buy clothes without trying them. The phone is equipped with a chip containing basic personal information such as size, weight, preferences, age etc. When the user is shopping and find a specific item of clothing, the shop can connect to the user's phone and translate the information of which specific size is needed.[154]

Some well-known IT companies have also entered the competition of new creative mobile phones. Recently Apple presented the iPhone that is scheduled to be on the US market during the fall 2007. It is a mobile clearly differentiated to their competitors. Equipped with a touch screen instead of telephone-buttons, it opens up for better image viewing and web surfing. It will exist in two different models; one with a hard drive of 4 GB and the other 8Gb.[155] Apple's iPhone is further proof that the convergence of different devices becomes more evident.[156] Google also plans to enter the device market in partnership with Orange. They will develop a Google-branded mobile phone, with a button giving direct access to Google services.[157]

[152] "Mobilmodet: turbo 3G i höst",Computer Sweden, Nov 17 2006.
[153] "Mobile devices: What are we meant to do with all this?", www.ft.com, Oct 4 2006.
[154] "Klädshoppa virtuellt via mobil ", Computer Sweden, Mars 16 2007.
[155] www.di.se, Jan 11 2007.
[156] Thomas Schiffer, Telia Sonera, Jan 12 2007.
[157] "Google och Orange pratar telefon", Computer Sweden, Dec 29 2006.

Google will even soon launch in partnership with Samsung an IP-phone, equipped with famous Google tools such as Gmail, Google Map and Google Search.[158]

Mobile operators provide phones equipped with diverse technologies giving the customer a large variety of tools other than just calling. Those techniques have obviously to be accompanied with service and application to facilitate for the user experience.

4.4.2 Current Situation of Mobile Applications and Services

Due to the emergence of WiFi, and the telecom industry's partnering with the IT-industry, we are about to witness two major industries merging together.[159] In the old PC-world various contents are commonly created and published through blogs, forums and other portals. By sharing music, movies, video clips users are in the middle of media creation.[160]

In terms of mobile-Internet Richard Lindgren, founder of Conveneer, a start-up creating applications for mobile platforms, underlined that mobile operators continuously block some Internet content in mobile phones. He believes mobile operators' action, is to force the use of their own services and installed contents. As a result, mobile operators have created a rather unpopular reputation of themselves. Jan Nilsson from Labs 2 also brought up the phenomenon: "In response to those threats, mobile operators are trying to complicate for customers to have Internet on a free-basis through their phones." The operators' own services are put forward but are often less popular and more costly applications. Jan Nilsson exemplified that trend with the issue of the e-mail applications. Operators do not leave the free choice of e-mail portal, but only propose their own. Users are then charged for every read or

[158] "Google.telefonen blir verklighet", www.e24.se, Mars 16 2007.
[159] "Hon är telejättarnas mardröm", Veckans Affärer Aug 31 2006.
[160] "Koppla inte av, koppla ned", TT, Dec 9 2006.

sent message even though e-mail is normally a free service, available in every household.

One of the biggest experts of the telecom industry, Östen Mäkitalo, has several times criticized the situation of today and claimed that entertainment features as music and TV in mobile phones, illustrates a lack of creativity. Usual services and applications proposed by mobile operators are unpopular and not user-friendly, according to Richard Lindberg. At the present, very few services offered by mobile operators are developed to fit customer needs. Instead of asking what the customer wants, operators develop what they believe is "cool".[161] "Today people want services that are relevant and useful which can help people in their daily life", according to Josefine Granding Larsson, Chief for Mobile Content on Aftonbladet. She added, "The price-model of a mobile service today is a joke. It is not even clear how much the customer has to pay". But in time, mobile operators will propose flat-rate offers in order to meet the demand. "There is a kind of fright for mobile services. The customer usually does not know the exact price, but with the increasing presence of flat-rate offers, services will become more interesting", claims Jan Uddenfeldt, Technical Strategist at Ericsson.[162]

Due to a lack of creativity and an unclear price-structure, mobile operators have to propose appealing services. This means that a mobile operator has to grasp and realize what will be the next future "killer-application" in order to attract customers. It would therefore be relevant to summarize a couple of ideas and beliefs about the sphere of new interesting contents.

[161] "Igel har ingen koll", Computer Sweden, Dec 15 2006.
[162] "Het debatt om mobilens framtid", www.realtid.se, Oct 26 2006.

4.4.3 Future Mobile Content

As a result of declining sales in the telecom industry, Anders Igel CEO of TeliaSonera, has announced his ambition to be a leading innovator of many mobile services.[163] Telia will focus more on R&D and reduce the time between the upcoming of an idea and its market introduction.

Having to embrace new technologies and attract customers, Richard Lindberg from Conveneer is convinced that mobile operators should focus on services and applications, and especially open up Internet on mobile devices. [164] Several persons with good insight in the telecom industry agree on the fact that operators, being able to provide the ultimate application and service in the mobile phone, could reach a sustainable competitive advantage. Having a killer-application would attract the majority of the customer base and, if protected, that advantage could also be sustainable. Paul Singham, International Voice Solutions Consultant at British Telecom, believes in the dominance of a future "killer-application". He says that it will be the only factor to attract and retain customers. As an example he referred to the iTunes Music Store, from Apple, which is now the world leader of online music sales.[165] As a future "killer application" for mobiles, he predicts that video-calls will have a huge breakthrough. Video-calls have a huge potential, but only if it can appeal and be easy to use. Attractive services and application can also be created through partnership with example famous brands like Google or Apple according to Paul Singham. It increases the customer willingness to buy, since the two brands are trendy and the most common among IT. Thus he means that applications have to answer a real need and be enough creative to stands out from other alternatives.[166]

[163] "Uppfinna mer", NyTeknik, Sep 20 2006.
[164] Richard Lindberg and Mark Klefter, Conveneer, Nov 2006.
[165] Paul Singham, BT, Dec 18 2006.
[166] Paul Singham, BT, Dec 18 2006.

Anders Staff, Senior Consultant at Telemanagement, underlined the creativity aspect of offering mobile service. He means that regardless of the network, the principal boundary for innovative services is the power of reasoning and creativity. Even with a simple GSM-network, the possibilities are still huge. Amazing services have been witnessed using only the GSM network. For example: Computer chips that enable the variation of Volvo truck's engine capacity from a distance depending on the weight of the load. Having a fixed fleet of trucks of different capacity, some of the offer is bound to remain out of traffic depending on a varying demand. With the mobile control of truck capacities, Volvo can rent more trucks for different prices wherever they are and operate with considerably more effectiveness. A similar technology is the chip installed in some BMWs alerting the driver with an SMS when to service the vehicle. Nokia has also shown a large extent of creativity during their World Conference in Amsterdam. Several services and applications were under discussion. The future mobile user will always be connected and get weather reports, road directions directly into the portable device. They will be able to listen to radio, manage their blogs and watch TV through the mobile device.[167]

Due to a large number of future services and applications, Marc Klefter from Conveneer, proposes the future mobile operator should be a global service provider with a packaged solution. Operators are the only ones who really know the customer and have the capacity to give them customer service and adapt the products to the end-user. Exemplifying that logic, he referred to RedHat, which is a packaged, adapted and user-friendly version of the Linux operating system. Klefter considers that the operator should apply the same strategy and offer a complete package of services adapted to ones customer-segment. Underlining that mobile services are the ultimate way to provide future sources of income, Klefter is convinced that different strategic paths will be elaborated: For example, the acquisition of different combinations of complements securing a network of services.

[167] TT, Dec 9 2006.

There are several signs implying that services will not come from the mobile operators if they do not act rapidly. They have to deliver several effective services to dominate the market. The innovative services will probably come from brands in other industries, not only from the media and the game sector. They have to find new ways to do business: on one hand they can become a global net-provider and on the other just a service provider or eventually both. [168]

Hjalmar Winbladh, a famous IT-entrepreneur and founder of Rebtel, thinks the future will be characterized by a clear division between service providers and network providers. In addition service providers will act on a global basis whereas the network providers will operate more locally.[169]

Contents will have a significant impact on the future of mobile operators. Predicting which services or applications will be central in a near future raises the question of which actors will actually be the providers of content.

4.4.4 Content Providers

Several content providers work closely with mobile operators, developing applications and services.[170]Although many mobile operators are offering a variety of downloadable services, the most popular content currently comes from third-party specialists.[171] Because of the high cost for acquiring new 3G licences, telecom companies have had to look at new revenue streams. Mobile content is in this regard, a way for many to recoup their investment.[172] Mobile content will soon be responsible for a significant part of the ARPU (average revenue per user) growth in Western Europe over the next five years, resulting in the drive for mobile operators

[168] ”Hon är telejättarnas mardröm”, Veckans Affärer, Aug 31 2006.
[169] “En enveten entreprenör”, Computer Sweden, Dec 1 2006.
[170] Richard Lindberg and Mark Klefter, Conveneer, Nov 2006.
[171] http://www.totaltele.com/View.aspx?ID=86620&t=4, Oct 2006.
[172] Ibid.

to produce and sell content to customers. Today's main income for these services goes to third-party content providers, meaning that mobile operators are potentially missing out on a huge revenue opportunity while their networks are used as a delivery channel.

One of several content providers is Aspiro, they are the Nordic market leader for distribution of mobile content services. Their service offer includes TV, music and game applications but also the access to Internet communities. Their sales channel is through partnerships with mobile operators and media corporations.[173] Soon a Swedish company named Emdo in partnership with Aspiro, will launch a service called "Drop me", in order to push people to download music to their mobile phone.[174] Even if 3 started its music service during 2006[175], the downloading of music has shown very disappointed results. The problem is that the current services lack in user friendliness. The "Drop me" service differs by having a music download feature that enables to buy a song simultaneously as it airs on the radio by pressing only two buttons. 3G customers will be able to use this service in February 2007.[176]

Recently, Vodafone has shown their ambition to integrate Internet brands in their mobile phone. The company will offer YouTube videos to its mobile subscribers over Vodafone live. YouTube is today the largest video sharing site on the web. In addition, Vodafone Live has a deal with eBay to provide a mobile eBay application that enables users to browse through products, place bids and buy fixed price products from cell phones. They also have a third partnership with MySpace the community owned by NewsCorp, where members can benefit from extensive social networking and more. Vodafone CEO Arun Sarin told Business Week that he expects all these mobile services to generate 10% of the company's revenue within three or

[173] www.aspiro.se, Jan 2007.
[174] www.di.se, Jan 5 2007.
[175] "18 miljarder borta - nu eller aldrig för Tres vd" Veckans Affärer, Nov 9 2006.
[176] www.di.se, Jan 05 2006.

four years.[177] A couple of years ago, Vodafone launched their own chat-system "O2-mobile-chat enabling their 12 millions customers to chat, but only 21000 used it. That failure was mostly because customers are used to keep in touch with their friends through MSN or ICQ instant messaging services. [178]

Incorporating MSN or other communities in the mobile phone, or in other words creating mobile communities, is a natural shift from web-based networking sites to mobile devices.[179] Mobile operators have realised the potential profit that the extensive world of communities represents. Enabling the user to reach his favourite community on his phone ultimately opens up for a large supply of services, for example location related services. [180]

The business opportunities are large, but the difficulty lies in the development of a sustainable business model. During the GSM-congress 2007 in Barcelona, the debate was very topical about the design of the future business model in a mobile Internet world. Mobile operators would not be satisfied of just being part of the future network and act an access provider; they want to be dominant actors benefiting from content. Their primary tactic is to collaborate with significant Internet magnates. Mobile operators have realized that they cannot create and benefit from future potential without content providers, says Bengt Nordström, analyst at Incode Wireless.[181] "We have to be brave and shake hands with those that we have never collaborated with before" says Hamid Akhavan, CEO at T-Mobile. During the GSM-congress in Barcelona 2007, Yahoo announced their collaboration with the mobile phone producer LG. It resulted in Yahoo services such as mailing and messaging

[177] http://gigaom.com/2007/02/09/vodafone-mobile-content/#more-8125, Feb 9 2007.
[178] "Mobile communities – New business opportunities for mobile network operators", Natalie Fremuth , Andreas Tasch, Michael Fränkle, MoMuc 2003.
[179] Ibid.
[180] Ibid.
[181] "Alla mot alla på mobilt Internet", Computer Sweden, Feb 16 2007.

provided in LG phones. In this case, the mobile operator might only be paid for the data transmission and miss out on the web-based actor's incomes.[182]

Marc Klefter is determined that mobile operators should learn from the content providers by engaging in partnerships or simply by acquisitions.[183] Mobile content has become a great money-spinner, but the current challenge is to find the optimal development and effective ways of charging for these services. One of the most debated content is the mobile-TV, implying partnerships with a complete new industry.

4.4.5 Mobile TV

Recently users have witnessed the future possibility of having incorporated TV in their mobile phones. While tariffs for mobile calls are increasingly subject to regulation, the major opportunity for new revenues lies in mobile data services.[184] Among these, mobile-TV has surprisingly been hailed as the biggest potential star.

Shlomo Liran, the CEO of the 3-group attempts to tease competitors "in the hope of launching a TV-service soon".[185] A version of mobile-TV service called 3 show, including up to 200 TV-channels all from Nickelodeon to Al-Jazeera is coming soon.[186] Richard Woodward perceives mobile-TV as an effective add-on service or complement and a "boredom killer" for the user, but doesn't think it's very likely of becoming a central income source.[187] He thinks 3 would be successful in packaging and advertising mobile-TV but would not ultimately engage in creating its own content. "Unless you are a conglomerate or media company aside of an operator

[182] Ibid.
[183] Richard Lindberg and Mark Klefter, Conveneer, Nov 2006.
[184] http://www.totaltele.com/View.aspx?ID=87003&t=4, Oct 24 2006.
[185] "Fast pris 3:s modell för mobilt Internet" Nov 17 2006 SVD.
[186] "18 miljarder borta - nu eller aldrig för Tres vd", Veckans Affärer, Nov 9 2006.
[187] Interview with Richard Woodward 3, Dec 5 2006.

activity, it is much more probable that operators will handle TV licences in a similar manner as cable operators currently do".[188]

Nonetheless, customers are rather sceptical towards mobile-TV. According to a customer-survey made by Teracom in December 2006, only 12% of the respondents are ready to pay for mobile-TV, although 50% consider it as a great and funny idea.[189] European mobile operators were hoping for the FIFA World Cup in Germany earlier this year to ensure a kick-start to their mobile TV campaigns.[190] Regrettably, a survey commissioned by Olista, examining consumers utilisation of mobile data services during the tournament, found that only 11% of respondents were interested in mobile TV. Paul Singham, from British Telecom, agreed on the user's response to mobile-TV. He was confident that TV in mobile phones will never be a success, "Think of yourself waiting for your bus in -20° in Stockholm, watching a small device". Östen Mäkitalo classified the telecom sectors investments in mobile-TV as crazy. The market tends to strive for bigger screens and better quality. "Who will pay for a TV-licence for the use on a mini-screen? ". [191]

Consumers will only match the industry's enthusiasm for mobile-TV when delivery and ease of use is seen as fool proof.[192] This is demonstrated again by the survey during the World Cup. It was found that nearly half of those who used a mobile data service for the first time would not use it again after finding faults in the service such as slow delivery, poor quality or even worse an undelivered service after payment. A mobile-TV breakthrough can be achieved by operators anticipating, detecting and resolving potential user adoption barriers and ensuring that the users enjoy a flawless first-time experience every time or they can forget repeat customers. Unfortunately, many operators are still too busy introducing new services. They

[188] Ibid.
[189] "Mobil-tv "häftigt och kul" men få vill betala" Computer Sweden, Dec 12 2006.
[190] http://www.totaltele.com/View.aspx?ID=87003&t=4, Oct 24 2006.
[191] "Het debatt om mobilens framtid", www.realtid.se, Oct 26 2006.
[192] http://www.totaltele.com/View.aspx?ID=87003&t=4, Oct 24 2006.

neglect to pay attention and manage the adaptation of the existing services and ultimately the user experience will continue to result in a disappointing outcome.[193] For mobile-TV to be a success it is clear that operators need to understand that with more users trying and actively using the service on a regular basis, mobile-TV can finally pay its way and become a profitable niche provided that it's well configured.[194]Incorporating TV in mobile devices may also involve advertising as on the traditional TV. But with a different screen-size, it force partners to adopt their approach.

4.4.6 Mobile Advertising

Several experts and mobile operators believe that advertising in the mobile phone will be the next interesting future source of income and will change the current business model. The daily topic is how will the advertising be designed and fit in the mobile phone? Advertising on mobile devices representing about 20% of the small screen and will have much higher impact than on a usual computer monitor. Thus the mobile phone can in the future be one of the largest advertising mediums; however it implies that the industry manages it competently according to Steve Ricketts third-party service relationship manager at Orange.[195]

Spreading adverting on a mobile device can easily annoy the user, which obliges advertisers and mobile operator to be creative.[196] It means that user experience will be an important factor according to Jeremy Wright, co-founder of mobile marketing agency Enpocke.[197] Customer experience can be created with banner ads tailored from data collected from the user. Chris Jeffrey, global CRM at Cap Gemini's telecom, revealed that by using business intelligence tools, an advertiser will be able

[193] Ibid.
[194] http://www.totaltele.com/View.aspx?ID=87003&t=4, Oct 24 2006.
[195] **"**Ads arrive on the mobile Internet", Revolution, Sep 2006.
[196] "Can mobile advertising benefit operators?" Ken Wieland *Telecommunications International;* Oct 2006.
[197] **"**Ads arrive on the mobile Internet", Revolution, Sep 2006.

to target a specific person with a definite product. [198] With location-based marketing, the advertising will be even more relevant, and will offer a deeper experience for the customer. For the advertiser the potential is huge, and mobile operator will be able to propose broader to their partners.

Sharing personal information implies also a security matter, which force mobile operators to propose safe and secure applications. What we have seen on the Internet, a large part of the advertising spreading to users is characterized as spam or irrelevant information. To not fail in the same ways as the computer based Internet, mobile operator should not neglect the security aspect.

4.4.7 Security

The security issue is an important obstacle for W-Lan to become a dominant actor.[199] Unsurprisingly, however, WiMax has its critics. Ken Munro, Managing Director of SecureTest, a security specialist, says that the security industry is now questioning whether WiMax can deliver. “Just like WiFi, security is not part of the initial specification for WiMax,” he argues. “Security is viewed as a software function and is therefore an ‘add-on’ or ‘nice-to-have’.” The implication is that WiMax will not be secure enough for serious use.[200] It can be quite risky if you share your Internet access with a wireless router. Neighbours can easily put illegal material on the web through someone else’s router, but that person is responsible for the content.[201] Paul Singham, voice expert at BT, pointed out the most important factors. Apart from the killer-application that will attract future customer, he considers the price and security aspect as respectively important. Along with broader public networks, personal and banking information are risky and sensitive for customers to handle. He underlined the significance that a security application could be central for the customer.

[198] “Can mobile advertising benefit operators?” Ken Wieland *Telecommunications International;* Oct 2006.
[199] Richard Woodward, 3, Dec 5 2006.
[200] “The Mobile Internet“, www.ft.com, Nov 16 2006.
[201] Thomas Schiffer, Telia Sonera, Jan 12 2007.

Jens Zander, professor at the University of KTH, warned of the security issue brought by the emergence of wireless networks, ”the few producers of network components makes potential security holes easily vulnerable”.[202] That danger is even more relevant today since company’s computers are connected to the outside environment hence to dangerous zones.[203]

In order to develop safe services, mobile operators and banks are working together in an organisation called Wpki. They have developed new applications meant to replace the standard ID-card.[204] Soon customers will be able to make financial transactions through their mobile phones within secure networks. Individuals will be able to identify themselves and log in their bank accounts through mobile devices.

The usage of mobile services via personal mobile devices can guarantee a clear identification of users by providing several security mechanisms for example identification by phone number, SIM-card or PIN.

4.5 Summary

As we have seen the telecom industry is currently situated in an uncertain time, resulting from emerging networks and new entrants. Yet, current mobile operators have not changed their business models. Most of the mobile operators still use their traditional source of income by using tricky methods, while a minority has maybe understood what will be the next way of doing business. However, most knowledgeable and influential persons from the industry pronounced that they have to embrace new services and applications. But the question still remains what will be the next killer-application and what will be decisive when the user chose its operator. Mobile-TV and advertising have been brought to the fore as interesting future content, if only it can have an appealing design. Incorporating new contents implies

[202] ”Hackare siktar på trådlöst”, Computer Sweden, Dec 29 2006.
[203] Computer Sweden, Nov 17 2006.
[204] ”Mobiltelefonen ersätter id-kortet”, Computer Sweden, Nov 22 2006.

redesigning new business models. For Hamid Akhavan, CEO of T-Mobile International, 2007 is "the Year of the Business Model", or so he suggested in his keynote at the Barcelona 3GSM convention in mid-February. The key changes in the mobile industry will, according to him, evolve around three themes: customer needs, market competition and technology. [205] His words are continuously permeated through our empirical part, which gives us a clear direction towards which way the telecom industry might currently pointing to. In having Hamid Akakhvan comments in mind, it is obvious that an analysis of the current situation and a design of new business models are rather unavoidable.

[205] www.telco.com, Nov 13 2006.

V. Analysis

The following analysis is disposed as presented in the model below. Using the chosen theoretical framework, the study's empirical findings can be analysed in two steps. A prior conditional analysis mapping out the industry's future and general market trends is necessary before engaging in the second step: examining the business model alternatives an operator could opt for in the coming years.

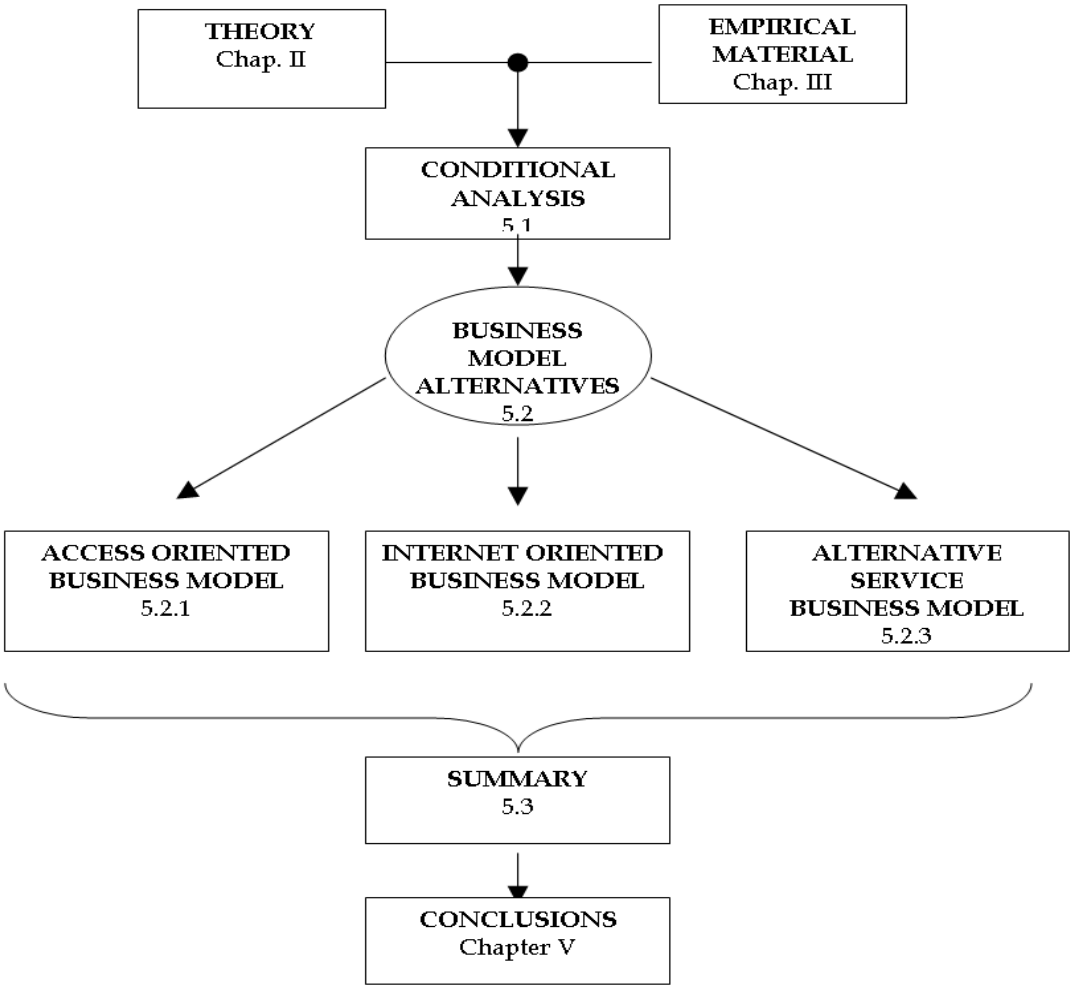

Figure 16: Disposition of Chapter V: Analysis

5.1 Conditional Analysis

In 1995, the telecommunications industry experienced the value inflow phase. The strong value/revenue ratio of a broad range of telecommunications companies suggested that the industry's business designs would continue to create and capture value.[206] Mobile operators then went over to a stability phase and benefited from very lucrative periods. The market was characterised by an oligopoly, with high margins, low competition and few technological threats.

Today the sector of mobile operators has evolved to a complicated situation. The competition from other mobile operators is decreasing and some recent acquisitions have been witnessed on the Swedish market e.g. Telenor and Vodafone. However another kind of competition is entering the market. Several W-Lan operators and IP-application producers are progressively entering the market. There is also a large presence of well-known Internet brands, which put traditional operators in a difficult situation. Fon, which is partly owned by Google and Skype, have been giving away wireless routers for free in order to reach a wider number of users.[207]Google themselves have also engaged in similar alternatives in California, striving for a complete wireless coverage of San Francisco and Los Angeles by encouraging the users of free routers to share their network by not configuring any passwords. Modern devices and technologies have then enabled VoIP using wireless networks, which in turn represents an interesting substitute to traditional voice services on regular networks. Being in an early development stage, these new possibilities are not to this date completely well functioning and have rather low quality and user-friendliness. Among the traditional mobile operators margins are being restricted and continuous price falls are witnessed implying they are on the verge of experiencing a value outflow-stage (or Stage 3 of value migration).

[206] Slywotzky, A., *Value Migration*, 1996.
[207] Affärsvârlden nr 45, Nov 8 2006.

Today the market is still calm and profitable, but according to experts and interviewed respondents beliefs, the market is pointing towards a value outflow consisting of decreasing opportunities for capturing value and less talent, resources and customers.

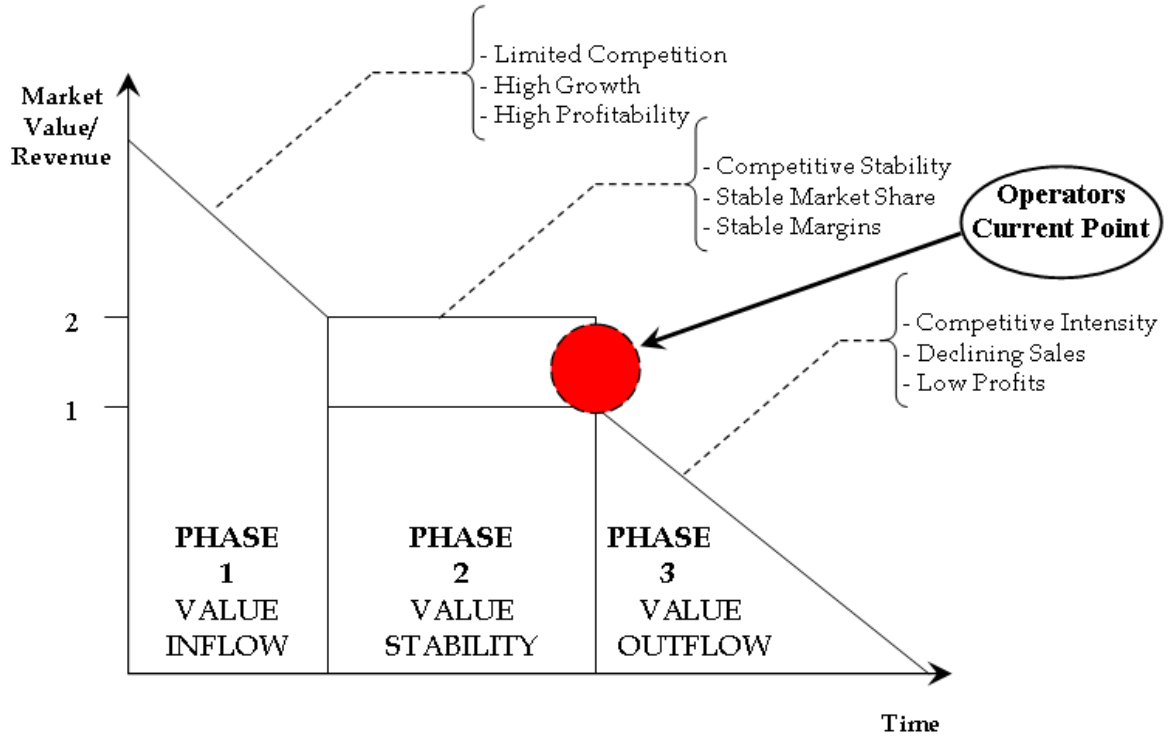

Figure 17: Operators Current Point in the Stages of Value Migration

A crucial point is that the actors of the telecom market are conscious of the future value migration. The theory of blinders of dominant logic reveals the difficulty of being creative and seeing outside the boundaries. Prahalad enlightens the fact that many industries and companies often become blind during prosper stages, and therefore have difficulty finding new ways to make money. Due to the actual situation between Phase 2 and 3, telecom operators have to find new sources of income if they do not want to fall into a low profit period with decreasing sales. As Prahalad points out logically, no companies change path when their margins are high. [208] Not knowing which phase the business design is in theoretically leads to

[208] Prahalad, C.K ”The blinders of dominant logic”, Long Range Planning Vol 37, 171-170, 2004

unexpected collapse since management objectives have to change along with the business design's life cycle. Currently mobile operators are in a situation with an oligopoly market and high profits which could be interpreted as a value stability phase. However they are conscious of the emerging competition coming up from completely new actors with a different way to do business. Ultimately, attempting to reverse the flow once the outflow phase is engaged, is usually too late.[209] It is therefore crucial for mobile operators to have the ability to detect when and how the transition process is taking place. Operators need to think in those terms actively in order to prevent new entrants as Fon, The Cloud and Skype from taking a considerable segment of their income and establish themselves as industry leaders. In other words, mobile operators have to know and define rapidly what the next phase will consist of if they want to prevail.

In response to this uncertain state of value outflow that is soon to come, some mobile operators have developed tricky price-structures, persuading the customers with low fees. According to Thomas Schiffer, a business analyst from Telia, minute fees for voice calls will not decrease anymore because "the voice-service has almost reached its lowest possible price". He is also convinced that mobile operators have to expand using creative service offerings while maintaining the same price level in order to remain competitive. [210] Some operators have already shown some sign of originality. It will become essential for them to develop diverse strategies to guard themselves from upcoming threats. Operators that have already engaged in partnerships with Internet actors have an even greater need to plan their future very well. Telenor is an example of an actor that has seen the potential of wireless networks made a deal with the wireless provider The Cloud, however potential profitability is uncertain. 3 started to collaborate with well-known Internet brands in order to develop a larger customer-base and to reach the goal of being a media provider. By integrating Skype

[209] Slywotzky, A., *Value Migration*, 1996.
[210] Interview with Thomas Schiffer, Jan 12 2006

in their phones, they obviously put the traditional source of income in danger, but on the other hand they reach a larger customer base and make their services more attractive. Such strategies will surely have an important impact on the future of the telecom industry. Those operators with integrating and daring strategies have a much greater chance becoming leaders and take a central role in the development of the industry since it has become a absolute condition to look beyond traditional borders and elaborate a completely different perspective on how to attract the customer and make profits.

In their search of defending and keeping their positions, mobile operators have to define which competitive advantage they own. Mobile operators' traditional focus on the 3G network for instance exemplifies the need of pinpointing real advantage of the technology. Presenting ones own strengths and selling argument is one thing, but there is a far bigger challenge of marketing an offer and convincing the customer of a technology's eventual superiority. A further example is the focus on different customer segments: several experts such as Hamid and Anders Staaf believe that establishing a focus on several key customer segments will more than ever be a determining competency in the future telecoms. They support the idea that operators need to find their niche in terms of customers and present differently tailored offers. Ultimately the conditions operators are currently finding themselves will trigger major changes. Promoting a new competitive advantage and design adapted offers including modern services implies a new way of thinking and certainly the redesign of their current business model.

5.2 Business Model Alternatives

Several forces tear at the mobile telecom Industry. Operators have a desire to maintain control over many stages of production (retail, services, network delivery and user equipment) and claim value for it, but are forced to change because of Internet's open presence as well as emerging networks and alternative offers.

The evaluation of a probable evolution of the mobile industry is gradually gaining in complexity since the boundaries of the mobile industry are getting harder to find. The wide and diverse range of recently related activities needs to be looked upon carefully.

Mobile operators basic role being redefined within the upcoming years, a principal issue would be to point out which types of activities that would be the most interesting for an operator to engage in. ”Operators will probably not go bankrupt but they have to adjust their business model when the definition of what an operator IS will change”, according to Katja Ruud, Telecom Analyst at Gartner.[211] As mentioned earlier, when value migration towards new activities occurs, it is vital to adapt the business model in order to prevail. Hence, re-evaluating a strategic profile and a certain range of activities induces constructing an appropriate business model and most probably shape the actual role of an operator.

The following analysis is therefore divided into three major domains mapping out the eventual business models an operator could opt for:

The first role an operator can adopt is an access-oriented provider, with a dominant focus towards offering the basic channel itself instead of a concrete service range. The operator acts as a provider enabling the customer to reach mobile services regardless of their actual application or origin.

The second area of activity that could be central for a mobile operator is the realm of services initially available on Internet being made applicable on a mobile basis using an adapted business model.

[211] Veckans Affärer, Aug 6 2006.

Finally the third option is for an operator to deliver alternative services using different technologies and originating from other sources than the Internet.

The three distinctive profiles mentioned above could be looked upon as general alternative ways for a mobile operator to develop given the conditional situation treated in 5.1. As presented in the theoretical basis of the study, the applied business model is set out by four interrelated components: value proposition, market segment, value architecture and revenue architecture (paragraph 3.5).

5.2.1 Access Oriented Business Model

During the last few decades, mobile operators have been using the GSM technology for all voice traffic and data transmission. Only recently have wireless networks such as W-Lan started to appear requiring relatively low investments. A hotspot costs a couple of hundred euros compared to the approximate 100.000 euros required for the installation a traditional mobile-phone station.[212] Building up a 3G network with high capacity, high coverage including the indoor is a very costly initiative.[213] W-Lan, on the other hand, allows users to surf and call with IP-applications for a much lower cost both for the operator and the user.

An obvious competitor or complement depending on the perspective is undoubtedly the wireless hotspot providers like Fon, The Cloud and Verizon. Together they are providing access with over 50 000 hotspots all over the world. Some are even giving away wireless routers for free in order to reach a wide number of users.[214] The common and huge competitive advantage they possess is the roaming technique which allows transmitted data e.g. phone calls, to jump from one network to another without interruptions. For example, users can call from a mobile device with W-Lan e.g. an IP-phone, not only within the wireless homework but also when they go

[212] Veckans Affärer, Aug 6 2006.
[213] ”Hon är telejättarnas mardröm”, Veckans Affärer, Aug 31 2006.
[214] ”Molnet över mobilmarknaden”, Affärsvärlden, nr 45, Nov 8 2006.

outside and into another hotspot area – thanks to the roaming technique. This has made it possible for IP-operators such as Skype to fast gain an increasingly number of new subscribers, today over 136 millions.[215]

If the operator chooses to compete with the core activity of letting network capacity, the new wireless competitors' hotspots have to be added in one way or another to the existing core activity. This implies according to Moore that the operators have to choose a temporal expansion of the existing activity, providing mobile access to the users. [216]

As the industry is moving from a stabile state towards a more uncertain future due to the new wireless networks and disruptive technologies, operators are forced to tackle new threats. In consequence we believe the access business model to be one way of handling these threats.

5.2.1.1 Value Proposition

The access based business models value proposition is to give the customer the possibility and availability to choose which type of network standard they want. The operator is only presenting a buffet with voice and Internet access alternatives and from there the customer is free to decide what to subscribe. The access proposition should enable different customers to choose depending on their type of usage. For example if the customer only uses the mobile to make calls, a traditional subscription maybe more appropriate, but if he or she wants to use it for another purpose such as surfing the Internet, read the latest news, arrange payments, schedule tickets, an added W-Lan subscription may be interesting.

[215] "3 satsar på fast pris för mobil Internet" www.svd.se, Nov 17 2006.
[216] Moore, G., *Living on the Faultline: Managing for Shareholder Value in Any Economy*, New York, PerfectBound, 2002.

Without an access, neither the Internet nor the mobile networks would be possible to use. This access based value proposition stresses the advantages of not trying to tell the customers what they want or need, but to communicate their networks characteristics (e.g. access speed, availability, reliability, cost etc.), its possibilities and implications compared to different alternatives and ultimately let the user determine the exact services.

In order to avoid the old industry paradigm Prahalad emphasizes on the co-creation process between the customer and operator. The operator creates value through rendering the access to a wireless network allowing the use of Internet and voice communication while the customer value is in the possibility of choosing and personalising the various services in the mobile device depending on the needs.[217] The advantage with this business model is the broad customer segment that can be addressed effectively. Due to the different access characteristics it does not limit the group of potential customers to age, geographical area or interests.

[217] See figure 18

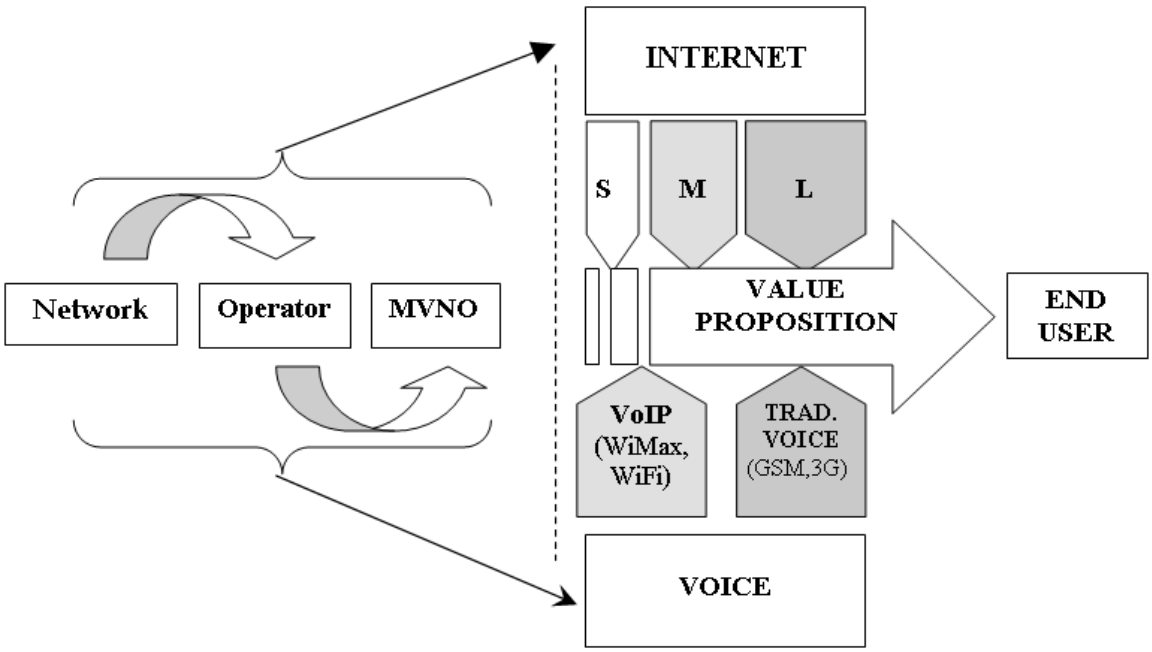

Figure 18: Access Oriented Value Proposition

MVNO (business to business) proposition

Mobile operators that own a network infrastructure also possess the opportunity to rent out network capacity to other "operators", more commonly known as MVNO's. That possibility adds a new perspective to the value proposition, a business to business perspective (B2B) apart from the mentioned business to customer (B2C).

The largest mobile operators can offer MVNO's a local network access to promote their services as well as a national network covering the complete country. The services and products could be the same as the ones the operator is offering or a selection of services (see fig. 5.3). Thus MVNO's can choose depending on the need and the customer segment that wants to be targeted within the boundaries of what the operator believes is acceptable competition. Furthermore, an MVNO will be free

from all technical problems affecting networks. Instead, they can focus on their core product as offering a branded mobile communication solution to the end-customer.

5.2.1.2 Market Segment

The competitive advantage with the access business model is the broad market segment focus towards customers. Compared to other business model where possibly facilitating services, constitutes the comparative advantage and the access model addresses every age, interest, demand and geographical area – not only a narrow market segment. One can argue that this might not be the easiest way of creating an adapted customer solution but on the other hand, the customers are becoming more aware of network characteristics due to the broadband industry and the growing presence of modern mobile technologies.

The value proposition being based on the two different types of services provided by the operator, voice and Internet access, these two distinct areas are made to suit different types of segments and profiles. The Internet access part could be divided into for example three different offers, Large, Medium and Small. These categories imply different characteristics distinguished for the specific size.

Large entails a fast access speed mainly for avid Internet users who wants to complete the needs of, e.g. watch a streamed video clip or program without any disturbance. The type of category or segment for this alternative would be young, educated, eager to learn and metropolitan with a common interest for media on demand. At the moment, the connection speed for this subscription is the newly upgraded 3G network 3G turbo which manages up to 7,2 megabytes / s. [218]

Medium is suited for an average Internet user who wants to use the Internet and to a limited extent want to use media on demand but most importantly are price

[218] ”Premiär för turbo 3G i Sverige” NyTeknik, Nov 15 2006.

sensitive. The target group for this offer is a typical suburban family and or people in remote areas. The network speed based on the traditional 3G-system provides up to 2Mb/s and is useful for phone and video calls, sending and receiving still or agile photos as well as other more or less advanced services.[219]

Small is the subscription for users that does not want to use the Internet with a mobile device, make video calls or any other sophisticated service. They just want to make phone calls. Nevertheless, it would not be impossible to use the Internet just as a Medium and Large subscription, although the quality is very poor because of the low speed.

The second area of access proposition, voice communication, is object for two different types of offers, traditional voice subscription and the "new" VoIP (Voice over Internet Protocol). With both VoIP and the traditional pricing model based on the GSM or 3G network, the operator simply can differentiate the end customer offer. The VoIP offer is a less expensive alternative due to the modern technology but does not offer the same reliability and voice quality as the traditional network, GSM or 3G. In terms of availability, mentioned Internet providers such as Verizon and The Clouds are continuously installing hotspots in city areas.[220] Since city-centres and densely inhabited areas, constitute the prime location for hotspots. But a VoIP alternative threatens the source of income, both for broadband and mobile operators since it is clearly the target environment for communications.[221] The W-Lan technologies, WiFi and WiMax, are easy to use and progressively becoming more accessible and also have the significant benefit of being less expensive than 3G.[222]

[219] www.pts.se Dec 2006.
[220] Jan Nilsson, Labs2, Dec 12 2006.
[221] "Molnet över mobilmarknaden", Affärsvärlden, nr 45, Nov 8 2006.
[222] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.

Bengt Nordström claims that the GSM and 3G-networks will be complements to WiFi and eventually WiMax since the latter covers city areas while the large-scale networks cover less urban regions.[223] 3G will be useful for those who are ready to pay for more mobility and a broader accessibility, urban and rural areas included, while W-Lan based technologies will serve smaller central areas for static use. [224]

For instance, metropolitans that do not travel or wish to pay for more than necessary could choose the VoIP alternative while older segments, business people or inhabitants of remote areas might strive for quality and reliability and opt for traditional but expensive offers.

Business to business segment

The operator has the advantage as the network owner to allow other actors who wants to offer their customers a mobile environment a possibility to rent capacity from the network. This makes a business to business segmentation necessary in order to prevent MVNO to attract customer from the operator.

This segmentation could be made based on the characteristics and possibilities provided by the networks. For example, if the operator finds it difficult to attract customers in a certain geographical area, they could offer a local actor who already has a strong influence to hire and sell capacity from the network. Another example could be to offer a service actor who has a differently targeted customer segment.

Recently Tele2 just signed a contract with TDC Song which allows TDC to use Tele2s networks as an MVNO actor. TDC's intention is mainly to focus on business

[223] "Hon är telejättarnas mardröm", Veckans Affärer, Aug 31 2006.
[224] Ibid.

customers as a part of their future strategy compared to Tele2 that focuses on the private customer market.[225]

5.2.1.3 Value Architecture

The actual value is created by allowing the customers to choose what type of voice and Internet access they need. This business model places the value creating process in the hands of the customer instead of creating value through spatial expansion or reconfiguration of activities. Thus the access business models strategy implies a more passive approach from the companies and manager perspective.

Instead of applying the traditional strategy, creating an offer to the market and implying that “this is what you need”, the operator claims “this is what we can offer, feel free to choose the exact services you want”. The process of value creation is then placed in the hands of the customer although guaranteed and carried out by the operator. This leaves the operator in a favourable position benefiting from a safe and passive strategy instead of developing an offensive and pro-active one that implies the risk of selecting services. This strategy could be looked upon as being a temporal reconfiguration. It implies a change of the structure and control of the core activity as opposed to a spatial expansion or reconfiguration strategy that require analysing the market to find new areas of business on adjacent activity chains. It is also more cost efficient because it does not bring the costs that follows new products, often based on expensive customer trend and behaviour analysis.

The passive strategy on the other hand relies on a high level of knowledge among the customers. Thanks to the Internet boom and emerging web-logic in the society, the customers are familiar with access characteristics such as speed and quality and what it means in terms of usage and features.

[225] http://www.tdc.se/omtdc/pressmeddelanden/?id=4, Mars 31 2006.

MVNO architecture

According to Anders Staaf, Senior Consultant at Telemanagement, MVNO's will probably increase and take a more important position concerning the development of the new networks in the next couple of years. In search for new sources of income, mobile operator can profit from the advantage of owning multiple networks. Due to the uncertainty of the future network standard, mobile operators focused on access will benefit from their broad alternatives.

In the empirical material, we brought up companies that helped interested actors outside the mobile communication industry to start their own MVNO. One of those is Spinbox, which manages the whole service to the end-customer. In order to propose a complete solution to a future MVNO, access providers should create or build up a partnership with companies such as Spinbox. As a result it will be easier for the access provider to advertise a simple concept covering all from access to customer support.

5.2.1.4 Revenue Architecture

Profits and revenue accrued by offering customized solutions to the end customer and MVNO's with value added services. On one hand the subscription price is depending on the speed of access to Internet and on the other, the total outcome of the subscription price will vary depending on what quality the customer is asking for and which services he wishes to have. If they want high quality including high coverage and reliability, they have to pay more compared to using the cheaper and less functional W-Lan based networks, also called value-based pricing.

This means that the operator could use the low-cost technology, WiMax, to attract customers who are interested in low prices, and the traditional networks, GSM and 3G, to attract the customers that are interested in functionality and reliability. Jens Zander, Professor at KTH@wireless, believes 3G will be useful for those who are

ready to pay for mobility and a great accessibility. If the customer wants fast access and good quality, for example watching streamed videos; the subscription price has to be more expensive compared to a slow access offered in the Small subscription. There will always be customers asking for top quality willing to pay more as there will be customers that want to use the same services but have fewer requirements.

The uncertain and changing industry environment enhances the importance of choosing the right investments that might create financial growth and future revenues for the company. The building of new networks is very expensive and it is likely that a strategic failure or miscalculation could mean bankruptcy or liquidation. Depending on what type of business model managers choose to integrate, two different perspectives can be looked upon, the business activities, core or non-core activity within the primary or adjacent activity chain.

Value creating activities have to be offered to customers that nowadays both want to talk and use the Internet whenever and wherever they are. The current situation with uprising technologies and new services forces managers to decide whether to be restrained to a traditional activity using NMT, GSM, 3G or to add a new activity space such that W-Lan networks, WiMax or WiFi, provide and if so, expand through acquisitions or partnerships with competitors.

Due to the price transparency with the latter option, it is most likely that the industry will develop to be very similar to the broadband industry. In the beginning operators are able to charge a high price but soon the upcoming competition will force the access supplier towards lower and more moderate price levels.

An operator is likely to succeed if there is a designed business model that comprises an expansion of the core activity. Operators with network restrictions such as offering one network solution like GSM when new networks have emerged and

gained market shares, are not likely to survive. Therefore operators interested in concentrating on their core activity, network access, are suggested to follow an access-oriented business model.

5.2.2 Internet Oriented Business Model

Services originating from the Internet constitute a vast array of opportunities for operators to improve their offer but need to be assessed correctly when applied to the mobile industry. In order to extend and redesign an operators' offer using Internet-based services, certain continuation and a consequent logic is absolutely necessary.

5.2.2.1 Value Proposition

A dominant factor is that Internet users get to some extent the value of free and unlimited information and various activities. The central characteristic of Internets' value proposition is in many ways its freedom: freedom of choice, usage, content, space and time constitutes the bone structure of the web more than the services themselves. Understanding the importance of the Internets open standards and open sources is crucial for the sector and a necessity for mobile operators.

Correspondingly the mobile telecom industry has a traditional value proposition that differs from the Internet's. The initial value mobile operators propose is basic but absolutely central: communication. The cornerstone is basically to guarantee the customer the ability to call and to be reachable on a mobile basis. Communication should therefore be delivered anytime and almost anywhere. This principal value is a decisive factor for customer's choice of mobile operator since it constitutes the original meaning of the mobile phone as a device. Furthermore there is a dominant security factor included in the traditional value proposition of mobile operators.[226] Once the "always-on" promise has been made, many customers can not afford being let down by the operator. Especially customer segment a reliable network of quality

[226] See paragraph 4.4.7

and a good reputation are therefore of importance in the traditional business models value proposition.

By nature, the initial value propositions should rather easily be merged into one coherently combined one. Having a multitude of users and a network, operators and Internet actors are able to match each other by presenting their traditional offer with an added dimension. Communication between users can thus be seen as a common ground that is in addition open for related value-adding services.

One of the greatest opportunity spaces brought by Internet services applied to mobile devices, are all the social networking activities. There is a natural continuation from the traditional value proposition of operators to recently created and very promising communities, chat and messaging services as well as IP telephony. 3's partnership with Skype and MSN as well as Vodaphone and MySpace, are, among others, clear examples of how an enhanced communication base is a natural extension of the initial value propositions.

Furthermore, the Internet brings new facets related to entertainment that used to be a small portion of operators traditional activity sphere. A feature such as being able to post a picture on a website or a blog directly from the mobile, using a website like Flickr for example, is a representative example of how the combination of value propositions can be made as long as the standard and source of content is open.

The future value proposition of an Internet oriented operator should include the expected efficiency and reliability but also far more possibilities on a fairly open basis.

5.2.2.2 Market Segment

Mobile operators choice of market segment relies on the type of customer they want

to reach. There is a relatively clear division among the operators in the mobile part of the telecom sector. Tele2 is, for example, very price oriented and propose low call-fees to young people. Telia, provides the network with the widest access and is able to reach many users including those living in remote areas while 3 has a strong focus on young users willing to use their mobile phone as an entertainment device including various music and media content.[227] Furthermore segmenting a market can be more or less a detail differentiation based on age and usage of mobile services. In this regard applying Internet content on a mobile basis implies that entertainment features, status services, business functions and simple user-friendly services should target their respective age segments.[228]

On the Internet, the segmentation is very much based on the user's needs, tastes and hobbies. Users tend to surf on Internet sites that are related to their personal profile and daily life. Several services are therefore seen as useless by certain customer segments. For example, a working middle-aged person is not typically part of the targeted customer group for services like MySpace Mobile, since their principal need is more oriented towards functional and practical information or communication tools than entertainment.

Services, and eventually users, can in a general way be segmented into the following three types of activity areas: entertainment, communication and information.[229] A merged mobile Internet offer would therefore induce a coherent market segmentation strategy and branding. Entertainment focused operators like 3 are for example keen on attracting the targeted users through partnerships and co-branding with corresponding Internet actors or directly with content producers like MTV. Combining an entertainment with a communication profile may be easier than

[227] Tahghrid Hodroj, "Fallstudie om mobiloperatörers marknadsstrategier", KTH 2006. See Chapter 4, paragraph 3.1.2
[228] Anders Staaf, Telemanagement Dec 18 2006. See Chapter 4, paragraph 3.1.2
[229] See figure 19

choosing an information- and entertainment-profile. Telia's reputation of reliable quality, professionalism and higher fees, could have a further interest for web-based information services (for example news media, educational websites like Wikipedia or ticket booking) since these users are closely related to their initial market segment.

As a consequence of a broader activity space, operators are more than ever forced to target their customers, based and built upon a clear profile and strong branding. Being stuck-in-the-middle could result in drastic losses of market shares and profits.
An additional complexity of segmenting the customers of an Internet oriented business model is that it's quite probable that network providers might operate on a more local basis. With that it mind, operators may be forced to think in terms of local preferences when segmenting their customer base. Many Internet actors have already engaged in that logic by creating less global communities, but focused on certain specializations and geographical areas.

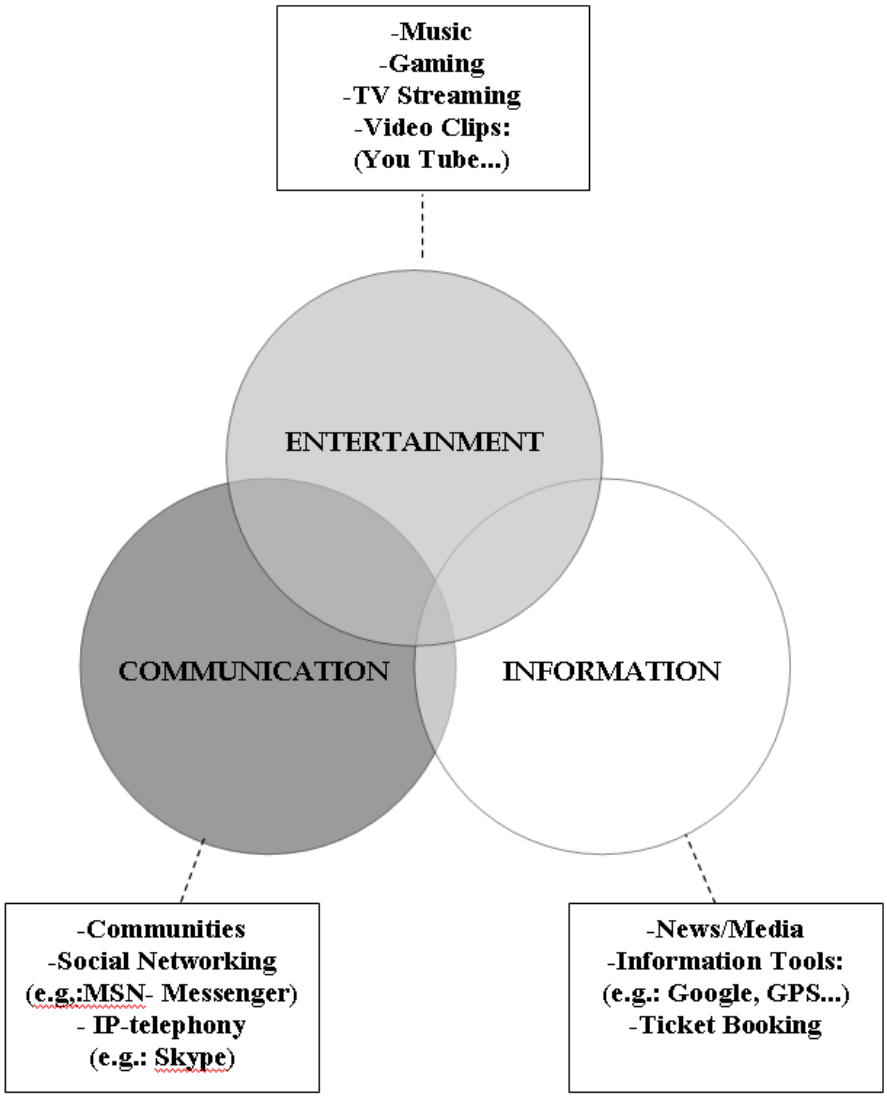

Figure 19: Mobile Internet Services: Three Market Segments

5.2.2.3 Value Architecture

The Internets value architecture has the specific property that the users mostly create the value themselves. Internet users are commonly sharing their information and contributing with their knowledge through "blogs", communities and many others. User generated content has become the predominant source of data leaving successful Internet actors focused on the access of that data. Claiming a major part of that value is already difficult on the web so Internet actors are constantly finding or inventing ways of maximizing their portion.

Operators' attempts of benefiting from content produced in-house or filtering content through own portals are very problematic when applied to the Internet. Computer literate users are naturally reticent to "walled-garden" logics and static offers since they are used to configure their PC as they wish and use web-based services freely.[230] An operator's position in the value architecture needs to consider that fact and at least give the impression of being an open-source provider. It is therefore problematic for an operator to claim a big portion of the value created when their role is not always central. User-generated content openly shared online via web based actors imply that mobile operators are providing an access on the go but not much of the services production and distribution themselves. Operators lack the competence of creating the content and only some have the advantage of being used to handle web-based services.[231]

Services that are genuinely mobile and serve a compelling need on a mobile basis might on the other hand be easier to claim a bigger portion from. Alternative services that are dominantly founded by operators and are not traditionally web-based constitute a favourable position for operators in the value architecture (treated in section 5.2.3).

From a broader perspective, operators have realised that introducing a feature induces further development and opportunities to open up for additional services. [232] It would therefore be rather short-sighted of an operator to view the introduction of an internet service in a far too static value architecture since further potential of mobile services seem unlimited.[233]

[230] Richard Lindberg, Conveneer Nov 2006; Jan Nillsson, Labs2 Nov 29 2006. See 4.4.2
[231] Richard Woodward, 3, Dec 5 2006. See 4.4.5
[232] "Mobile communities – New business opportunities for mobile network operators" MoMuc 2003. See 4.4.4
[233] Anders Staaf, Telemanagement Dec 18 2006. See 4.4.3

5.2.2.4 Revenue Architecture

As previously pointed out services supplied by Internet actors can be very useful in a mobile context but have the problematic characteristic of being free on the web and thus hard for operators to charge for.

When subscribing to mobile phone offers, customers have to pay a monthly fee to one of the existing mobile operators. It usually includes a amount of minutes the user can call for. For the last few months, mobile operators have been offering alternative subscriptions allowing the user to call for an infinite number of hours at a fixed price. Usually customers get a subvention mobile phone included in the charged subscription. The primary earnings originating from voice services, mobile operators also propose added services e.g. Internet-access. Operators used to charge for each megabyte downloaded by the customer.

Mobile operators' business model, with a major focus on voice, embraces the customer in a complete communication solution but for a very high price and within a deliberately complex price model. There is no doubt that customers have a hard time trying to find out and understand what they actually are paying for.[234] At present very few services offered by mobile operators are developed to fit customer needs.[235]

The Internet model enables users to share information on a free basis without having to consider different cost structures and unclear price-models. Web sites reach their earnings by attracting as many users or visitors as possible. Depending on the ratio of visitors, advertising spaces vary in price and constitute a central income source. Purchases made by users that have clicked on a link to commercial websites benefits

[234] Josefine Granding Larsson, Mobile Content Aftonbladet, Jan 2007 See 4.4.2
[235] Computer Sweden, Dec 15 2006.

Internet actors with commissions and more profits.[236]

Compared to traditional mobile services, a dominant part of the Internet is free of charge but claiming that it is completely free would be a false assumption. The Internet model induces a monthly payment to a network operator for the customer to access the Internet. The flat-rate fee charged by operators is then completed by some web-based actor's various offers. Several sites invite the user to pay micro-payments for the access to various content as well as subscription fees for enhanced services. Applications like Skype and MSN are in fact incrementally free.[237] Taking these micro-payments into account, mobile operators should be able to claim part of these revenues when integrating Internet services in mobile devices.

It is apparent that mobile operators would like to employ their traditional revenue architecture with mobile Internet services, but also that they are conscious of the contradiction it would imply. A central problem with mobile Internet services is that they compete with the same services in a non-mobile setting, which means that a wrongly configured payment mechanism could rule out a service from being used in mobility.

"The IT-market's interest in telecommunication is above all the access to more registered users which can increase advertising incomes", according to Per Blom, Responsible for Telecom at Cap Gemini Sweden.[238] That same interest should eventually become as important for mobile operators given that they have the possibility of benefiting from the same income sources as Internet actors.

Combining offers and offering packages directed towards certain customer segments, is a competency operators obviously have in the traditional telecom

[236] See Chapter 4.
[237] Richard Woodward, 3, Dec 5 2006.
[238] Richard Woodward, 3, Dec 5 2006.

industry and should also be something to hold on to.[239] Adapted to a web-based service offer, operators can find new income sources in two ways: Gain inspiration from existing Internet actors' payment mechanisms and innovate by taking advantage of the mobile aspect.

Applying similar tactics as several web-based service providers and learning from them could prove to be very efficient since they face relatively analogous issues.[240] They could also offer premium subscriptions for enhanced versions of services for monthly fees. By giving the possibility to use a service in a basic version for no direct cost is an effective way of attracting customers and leads them to further purchases that in turn constitute major incomes.

Through partnerships with existing IT firms, operators have the possibility to improve several services by proposing mobile functions and thus claim a portion of the generated incomes. Providing that the offered set of services is well configured in terms of value proposition and market segment, operators have the opportunity of taking a dominant position in the value creation process and ultimately maximize their profits.

5.2.3 Alternative Service Business Model

Mobile operators have for the past decade launched a variety of services and applications facilitating daily communications and answer the needs of users. Handsets are today equipped with features that have opened new services from downloading music to sending pictures and images through MMS. But mobile operators still have the difficulty to be innovative and invent attractive features and services that are, user-friendly and answer an evident customer-need. According to experts and people with insight in the telecom industry, operators are lacking creativity and have difficulties identifying customer-needs. Just like the blinders of

[239] Marc Klefter, Conveneer, Nov 2006. See 4.4.3
[240] Ibid.

dominant logic reveals, the profitability of a company and stability of economy tends to blind new creativity.[241] Another important aspect that Prahalad treats is the fact that a business or industry can not afford to ignore disruptive technologies if they want to keep up nourishing the market. The company has to allow the "customer into their kitchen" as Prahalad implies if they do not want to experience the same scenario as the music industry did with the involvement of peer to peer programs such as Napster or Kazaa. According to Richard Lindberg, usual services and applications currently proposed by mobile operators are unpopular and are not user-friendly. Operators therefore have to grasp and profit from the opportunities caused by the emergence of new technologies.

The alternative service business model design is divided in two different categories of features. The first block covers key features that are more hardware-focused and includes services that are related to relevant electronic products, such as cars, home-equipment etc. We will refer to that section by grouping it under "technology integration". The second block is named "service integration" and is aimed at integrating existing common services into the world of mobility such as buying a train ticket or listen to music in the mobile device.

5.2.3.1 Value proposition

Mobile operator's primary focus has traditionally been to enable their customers to communicate with each other. Due to the increasing digitalization of our society, operators now have a wider window of opportunity to face. We believe mobile operators will have to offer an extended range of mobile-features to facilitate the customer's daily lives. In the "technology integration" category, users will be able to integrate and communicate with electronics that they normally are confronted with. Anders Staff, Senior Consultant at Telemanagement is convinced that several services can be developed with the traditional GSM-network. He exemplified with

[241] See paragraph 3.4

features enabling users to have contact with the car. Besides, we judge that it exist even more synchronisation than just with a car. For instance, user will in the future be able to connect to their refrigerator or TV when they want to record a TV-program, know when the milk is out of date or simply receive a SMS when the car alarm has gone off. Some of these services already exist but are still expensive and therefore not used.

On the other hand the "service integration" implies a complete different kind of services. For example, instead of taking out the wallet when buying a subway ticket the user can today send an SMS to a server, enabling the money transaction. As mentioned in the empirical part mobile operators and banks are working together in an organisation called Wpki to expand money transactions possibilities. They have developed a new identification application meant to replace the standard ID-card.[242] With this application in the future we think individuals will be able to identify themselves and log on to their bank accounts through mobile devices, thus putting credit cards existence doubtful. In addition even mobile devices have developed diverse features, as the recently patent applied from SonyEricssons, enabling to fit your personal information with the potential right clothes.

Nowadays, mobile operators offer interesting mobile-features like mobile TV. Experts have had both negative and positive attitude towards mobile TV. The small screen and the demand for high battery level have obviously led to some scepticism among customers. Due to the theory of customers as innovators, it is most likely that mobile TV will be popular if the customer can choose what and when he wants to watch. In fact the customer will be able to choose his favourite TV-program, provided by the mobile operators. If the customer will be a part of the value creation and the choice of content is transferred to the customer and not anymore to the TV

[242] "Mobiltelefonen ersätter id-kortet", Computer Sweden, Nov 22 2006.

broadcaster as in traditional way, we believe that mobile TV can have a great breakthrough in the future.

According to Marc Klefter from Conveneer, mobile operators should act like RedHat, (providers of a packaged Linux operating system to users in a more user-friendly way). Mobile operators are commonly known for having terrible telephone customer assistance and therefore have difficulties to communicate the advantage of the techniques to the customers. Thus we suppose mobile operators should package these two blocks above in a simple and easy solution installed in the mobile-phone. This is indispensable if the operators want to keep a long-lasting relationship with their customers, and be constituted by three main focuses, service support, security and user-friendly interface.

We consider that an efficient and service-minded, 24 hour and 7 days a week service support (hot-line) should be put in place, responding within 3 minutes to all kind of technical problems. In terms of security, we brought above the advantage of the identification of the mobile phone. To propose a product not only made for technical interested people, mobile operator will integrate a user-friendly interface enabling the user to reach their favourite features. By integrating all different services in one handset with a packaged solution, the user will be owner of a “remote control of life”. The most important factor in the offer is to focus on simplicity for the customer and with an interesting, understandable and clear price-model.

5.2.3.2 Market Segment

In terms of market segments, everybody might obviously be interested by those future added features. Although, the two described blocks above should be focused more or less at specific market segment. The “technology integration” is conformed for pioneers or early-adopter consumers, demanding moderately high-technical techniques and has an interest of new things. In a long-term perspective middle-aged

users with the need for simplicity and security, should be an interesting market segments for those services. Senior users with a quite good living standard are demanding simplicity, usually just one handset, which integrate with the whole home-equipment. Easily “the remote control for life” can handle your car, your house-alarm, your fridge, to list a few possibilities. Older people get annoyed as a result of too many technical features surrounding them, but by proposing just one simple and easy solution, they will be able to get access by a simpler click on their phones.

The “service integration”-block fits for users that strive to make their daily life simpler and quicker. The primary purpose is to get quick access to service that usually need your computer or other devices for. These services imply for mobile operators to target customers whom are commonly short with time and need quick information. Business people and young families primarily have an interest in the development for those mobile-features.

The disparity between users brings mobile operators to propose a large pallet of services where the customer will be able to pick their favourites. Mobile operators can for example offer three different basic service packages which are aimed to match a specific kind of market segment. The customer will afterwards be able to modifying his package by adding or deleting some features. The product will be designed by the customer and can easily create for instance their own “business package”.

5.2.3.3 Value Architecture

The value architecture is significant in the development of new services within mobile operators’ business model. It illustrates important partnerships and collaboration with other actor in order to develop an efficient market-strategy and an appealing product. This implies a new challenge for mobile operators as mentioned

by Hamid Akhavan, CEO at T-Mobile “We have to be brave and shaking hands with those that we have never collaborate with before”

For the “technology integration” - block, strong partnerships are essential to make the service as durable as possible. The mobile operators have to build up business partnership with leaders in home-equipment suppliers as Electrolux or car manufacturers like BMW. The result will be special fridges and cars that are enabled to communicate with the customers’ mobile device. The connection will only be engaged through the mobile operators’ network. In terms of making it more user-friendly, the mobile operator might configure the phones with special buttons to quickly reach these services.

Mobile operators should be careful of the increasing competition of integrating products and services. Almost every handset producer also produces home and kitchen equipment as LG, SonyEricsson and Philips. Possibly they may come up with integrated solutions that link televisions, microwaves, DVD-recorder with their phones. In this case, the mobile operator will only provide their network and the big part of the value is lost. In order to avoid missed source of income, the extra value created by a mobile operator will constitute a critical point to retain the users and be a relevant factor for creating long-lasing relationships.

In the “service integration”- block, mobile operators will have to create partnership with banks, cinemas, and other service providers. In terms of competition, other mobile operators may affiliate themselves with the same service providers, besides it will be quite surprising if a bank accepted to get accessed by only customers from one mobile operator. As a result a mobile operator needs to create a competitive advantage by designing the phone for those features by linking mobile phone producers and service providers. In terms of entertainment, mobile operators will have to continue to build up strong relationships with the content provider as

Aspiro, Nordic leader in content for mobile phones. Developing profitable relationships with simple and appealing content, will limit the user to find their content illegally on Internet. Music can today be reached legally through Internet if you accept an amount of advertising. This model should be interesting also in the telecom spheres. Recently SL (Stockholm's local traffic) completed a deal with Telia and Tele2 to make it possible to buy a single train or bus ticket with just a simple SMS.[243] We believe that partnerships with diverse external actors will in the future take a more important part in the telecom industry.

In fact mobile operators will be global service providers proposing service outside the boundaries of the traditional telecom industry. Partnerships and collaborations with groups outside the telecom industry, implies for mobile operators to do business with completely different industries. Entrance of complete new organisations, brings up a redesigning of the value network and a different approach.

5.2.3.4 Revenue Architecture

In five years, mobile operators will no be able to sell services per click or per connection. Internet and all different services will be reached in a flat rate access, enabling the customer to get connected to their favourite features unlimited times. According to experts, the price structure has to be attractive and easy to understand. Thanks to the development of flat rate offers, it will be easier for customers to understand for what they are paying for, "There is a kind of fright for mobile services. The customers usually do not know the exact price, but with the increasing presence of flat-rate offers, services will become more interesting", claims Jan Uddenfeldt, Technical Strategist at Ericsson.[244]

[243] www.sl.se, Jan 18 2007.
[244] "Het debatt om mobilens framtid", www.realtid.se, Oct 26 2006

Instead of getting paid per click or connection, mobile operators have to charge for their added features. A customer for example wants to have a connection possibility with his car and his bank. With a monthly fee, depending on number of services the user will demand and add, he will get access to these two service-blocks with an easy access from the mobile phone which is fit for purpose. As mentioned in the market segment part, different packaging solution will be proposed, each package will have a different price model depending on the number of features the user have added.

Another interesting profitable source of income along with these services can be advertising. By subscribing to a mobile operator, the user is sharing personal information such as hobbies, skills, taste, and social environment, information also gathered by subscribing to different services and Internet-surfing. This information is really precious for mobile operators and for the advertiser; and enables them to send oriented and specific advertising into the phone. The customer can choose to pay for his services as TV, banking, fridge-connection, but he can also by accepting advertising get these services for free. This valuable and personal information will naturally push the company to collaborate with all kinds of companies and activities. The advertising will be customer-made, and the user will directly feel concerned about the incoming advertising. It will enhance the customer-experience and let the user to take part of products that is especially fit for them. With the location-related service, shops and restaurant can easily reach potential customers in a near area.

In terms of earning money through partnerships, it is important for the mobile operator to attract new partners and actors by sharing of the co-created content and services. Obviously, partners might earn more money in some cases by proposing their services without a mobile operator. But through the mobile operators, a complete solution will be co-created and a larger customer-base will be reached.

Integrating new actors implies also some risks. According to the theoretical part that Sawhney mentions, a couple of threat in adding services to your traditional value-chain. There is especially a financial risk, cause of a new kind of customer base and new activities including new market risks. They respectively tackle the following basic issues: ”Can we do it?” “Will the customers be attracted?” and finally financially “Can we make money?” [245]

[245] Sawhney, M., Balasubramarian, S. & Krishnan, V.V., *Creating Growth with Services*, MIT Sloan Management Review, Winter 2004.

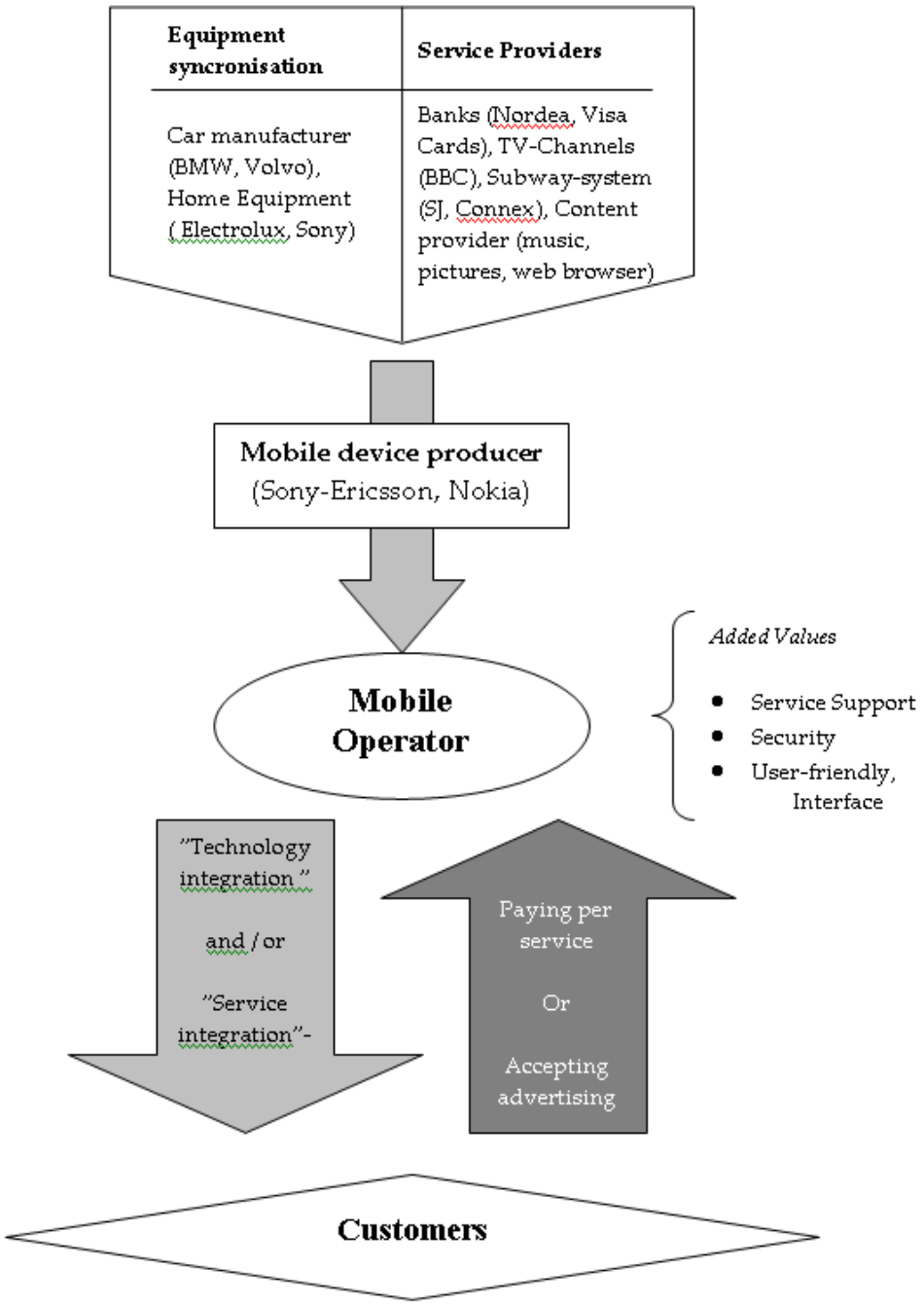

Figure 20: Scheme of the Alternative Business Model

VI. Conclusions

In this final chapter the prime conclusions are drawn and our results answering the study's central issue are presented. Suggestions concerning further studies are also put forward.

6.1 Conclusions

Following many prosperous years of unthreatened benefits operators are on the verge of major changes. The industry is experiencing a classical case of value migration triggered by disruptive technologies that are redefining the basic conditions of most actors involved. Their thriving past and current benefits are acting as a blindfold preventing operators from grasping the probable evolution to come. A primary deduction would be that if anything, operators must take some action to avoid being far too struck by severe value outflow. The challenge created by emerging mobile technologies makes operators decisions in the future, absolutely necessary if not crucial for survival. Knowing what to actually do and more precisely what to focus on when redesigning or constructing a new business is a difficult process. Finding ways of marketing new possibilities related to a technology towards a targeted customer base could be looked upon as a founding challenge raised by the general conditions and trends operators are facing.

A myriad of more precise factors can affect the outcome, which forces operators into urgent need to establish determinants to take into account. The networks being the basis of all future services, a trade-off needs to be made between capacity (abundant data traffic) and geographical coverage depending what profile and customer segment the operator seeks. It is still very uncertain if a single technology will become a standard in the coming years and if so, which one. Opinions are very diverse regarding the positives and negatives of the 3G, WiMax and WiFi networks actual possibilities. That is a central point since the latter constitute the eventual threat facing operators. If the upcoming of a network standard will be witnessed, it

may certainly depend on the networks ability to fulfil the majority of users need. Even if a non-standard network would be technically superior, users will not find any real need or reason for paying for something they do not use. Therefore it is essential for operators to invest in the network they can have the most utility and profit from. Due to the multiple choices of technology, it is obvious that networks will take a more significant role in the competitive landscape of mobile operators.

The influential trends redefining the industry as a whole shaping the conditions that operators are bound to live with, we chose to identify three different types of pro-active business models leaving an operator with alternative ways to deal with the uncertain upcoming years. Deciding what to offer, to whom, figuring out how to be a dominant actor and how to reach optimal profits involves plenty of aspects and raises many possible answers. But categorising three main profiles for an operator to act upon could act as a starting point towards clarifying a set of paths in regard to the upcoming changes.

Choosing an access-oriented strategy is a relatively less drastic strategy considering the fact that operators are somehow taking a step backwards focusing on owning the pipe and simply propose the access to a vast foray of services or simply rent out the network to well-known brands. That would be the closest an operator could be to what's commonly understood as a traditional activity or primary activity chain. Instead of forcing an offer to the end-customer, the latter is included in the process of actively configuring his own mobile device and satisfying his own needs.

An advantage would therefore be that the existing internal competency should be sufficient and being the owner of diverse networks exempts the operator from missing an eventual standard. On the other hand it could be a risky alternative to allow new actors take a dominant positioning creating and distributing specific service offers with high margins instead of competing.

An Internet oriented business model is for that matter a more aggressive option. Operators have endless opportunities of applying an Internet based landscape of services onto a mobile sphere. Adapted versions of entertainment, information and communication applications can prove to be very successful. A prime problem lies in the revenue architecture of such strategy. At first, an Internet-oriented operator will most probably have to accept the limiting way of charging customers on the web. Once a value proposition is clear and the operator's place within new value architectures has become apparent, operators have the possibility to innovate with new payment systems that could maximize profits, especially within the field of tailored and geographically targeted mobile advertising. By nature, the offered content will have to be different if the logic of the Internet is dominant. Being able to download the software of your choice and configure it as wished, is a given requirement of the future mobile Internet. In conclusion or In summing up, an Internet-oriented strategy and business model requires as radically different way of flexible thinking, top-of-the line creativity and marketing solutions. Acquiring or collaborating with more competent actors would for these reasons be an appropriate measure provided that the operator in question is fully conscious of the implications and consequences.

The third way of actively handling the upcoming years differs in the way that an alternative service business model relies on specific technologies where the operators are directly involved without competing within a far too broadened industry. Internet actors can therefore be left out from the distribution of these services and operators have a less competitive domain they can profit from without major pricing issues. If alternative services are valued and focused on accordingly within five years, operator's incomes can be secured. If a credit card function becomes a standard in mobiles for example, operators will be able to comfortably charge a small fee for every transaction. Enabling the mobile phone to be a multiple mobile tool,

rather than just a calling device, implying large possibilities for mobile operators. Hopefully the mobile phone can take a central role in the emerging technical focused lifestyles and households, which will enhance mobile operators' activities and their incomes. Correspondingly, an alternative service business model requires specialized creativity and a genuine understanding of customer-needs.

Regardless of the exact business model an operator opts for, a useful way of handling the upcoming changes has proven to be a concrete customer perspective. The multitude of services and combined offers that operators can develop is a remarkably simplified issue when directly considering customer preferences. Tailored offerings and personalized value creation is efficiently dealt with when end-customers are involved in the process. The customer becomes a co-designer of content and does not have to pay for more than he or she chooses to use. The acces-oriented business model is therefore an effective way of achieving that goal.

Mobile devices would ideally be configured as a single "remote control of our lives" including it all as Symbian CEO Nigel Clifford pointed out[246], but technical restrictions along with user friendliness ultimately leads to fewer, effective and genuinely needed services. Satisfying quality, variety and openness will be key aspects for customer segments that are gradually juxtaposing the use of personal computers and mobile devices. A single killer application might as well prove to be successful but most likely a killer set of services will have to dominate within coherent customer segments given that the number of actors and offers will multiply and expectations will be higher.

Finally, determining which changes constitute the future of mobile operators in regard to the emergence of new networks is not an easy task. Several spheres

[246] See Paragraph 1.1, "Mobile devices: What are we meant to do with all this?" by Mary Branscombe, ft.com, Oct 4 2006.

originating from the entertainment industry and the world of media also accompany the convergence of Internet and telecommunications, which sets operators in a situation where understanding the complex “cocktail” of their industry is more important than ever. In order to avoid far too severe confusion and take an effectively basic and cautious measure, we have identified that an operator choosing to remodel ones business model has to value and involve the customer, clarifying the actual needs and possibilities. That return to basics would not only help the major shift operators and bound to encounter but also accelerate the innovation and adoption of future mobile devices in an a promising manner.

6.2 Future studies

The questions raised and analysed in this thesis involves many further issues of interest to study. One could opt for a precise operator analysing the exact offer in regard to the overall evolution. A specific measure taken by an operator could also be relevant, for example how to handle an acquisition or partnership with a web-based actor, or if introducing a specific service is a clever move. A single marketing or financial perspective can be chosen in order to answer questions that are exclusively based on market surveys or a financial analysis. These issues will progressively become more apparent and dealt with by operators when urgent actions need to be taken.

Additionally, further predictions regarding the outcome of future networks and services can be made since the industry is in constant change and decisive events can reshape the founding conditions.

It would also be interesting to correspondingly reverse the problem and pose the question of how an Internet based actor, such as Google, could enter the telecom industry and dominate mobile Internet as a complement to this thesis. What would be their competitive advantage, how could they use their market position on the

Internet to become dominant in these new areas of activity? Many aspects to be raised would be related to those mentioned in this thesis, but the innovative and creative capability of many actors on the web makes the point of departure and future potential very different hence worthy of note.

VII. References

7.1 Literature

Alvesson, M. & Sköldeberg, K., (1994) *Tolkning och Reflektion*, Studentlitteratur.

Bhaktavatsala, C., (2005) *Three Models to Make Your Company Mega*, Businessline.

Backman, J., (1998) *Rapporter och Uppsatser*, Lund, Studentlitteratur.

Bryman, A. & Bell, E., (2005) *Företagsekonomiska Forskningsmetoder*, Malmö, Liber Ekonomi.

Cartwright, S.D. & Oliver, R.O., (2000) *Untangling the Value Web*, Journal of Business Strategy.

Christensen, C.M., (1997) *The Innovator's Dilemma*, Boston, Harvard Business Press School.

Cox J., (2006) *New WiMax raise the stakes*, Network World, Vol.16 - Iss. 23.

Derefeldt, Djerf & Waldö, (2001) *Affärsmodeller för mobilt Internet*, Lunds Universitet.

Dosi, G., (1982) *Technological Paradigms and Technological Trajectories*, Research Policy.

Halvorsen K, (1992) *Samhällsvetenskaplig metod*, Lund, Studentlitteratur.

Jacobsen, D. I. (2002) *Vad, Hur och Varför?*, Lund, Studentlitteratur.

Moore, G., *(*2002) *Living on the Faultline: Managing for Shareholder Value in Any Economy*, New York, PerfectBound.

Porter, M., (1985) *Competitive Advantage: Creating and Sustaining Superior Performance*, New York, The Free Press.

Porter, M., (1980) *Competitive Strategy*, New York, The Free Press .

Schubert, P. & Hampe, J.F, (2005) *Business Models for Mobile Communities*, Switzerland, University of Applied Sciences Basel.

Slywotzky, A., (1996) *Value Migration*, Boston, Harvard Business School Press.

Stähler, P., (2001) *Business Models in the Digital Economy*, Original Title: *Geschäftsmodelle in der digitalen Ökonomie*, Köln, Lohmar.

Wiedersheim-Paul, F. & Eriksson, L.T, (1997) *Att utreda, forska och rapportera,* Malmö, Liber.

7.2 Scientific Articles

Camponovo, G. & Pigneur, Y., (2003) *Business Model Analysis applied to Mobile Business,* 5th International Conference on Enterprise Information Systems.

Chesbrough, H. & Rosenbloom, R.S., (2002) *The Role of the Business Model in Capturing Value from Innovation,* Industrial and Corporate Change, Vol. 11., No. 3.

Chesbrough, H., (2003) *Open Innovation: The New Imperative for Creating and Profiting from Technology,* Harvard Business School Press.

Christensen, C.M. & Rosenbloom, R.S., (1995) *Explaining the Attackers Advantage,* Elsevier, Research Policy 24.

Drucker, P.F., (1973) *Management: Tasks, Responsibilities, Practices,* New York, Harper & Brother.

Eisenhardt, K.M. & Brown S.L., (1998) *Time Pacing: Competing in Markets That Won't Stand Still,* Harvard Business Review, p59-69.

Fremuth, Natalie, Tasch, Andreas & Fränkle, Michael, (2003) *Mobile communities – New business opportunities for mobile network operators,* MoMuc.

Hedman, J. & Kalling, T., (2001) *The Business Model: A Means to Understand the Business context of Information and Communication Technology,* In Wrycsa, S (ed), Information Systems and the Future of the Digital Economy. Gdansk: ECIS.

Helin, J., TeliaSonera, (2003) *Challenges for the Future Mobile Operator Consumer Business,* mBusiness Conference, Jun 23-24.

Normann, R. & Ramirez, R., (1993) *From Value Chain to Value Constellation: Designing Interactive Strategy,* Harvard Business Review, Vol 71, Iss 4.

Prahalad, C.K, (2004) *The blinders of dominant logic,* Long Range Planning Vol 37, 171-170, Harvard, Elsiver Ltd.

Rappa, M.A., (2004) *The Utility Business Model and the Future of Computing Services,* IBM Systems Journal 43.

Sawhney, M., Balasubramarian, S. & Krishnan, V.V., (2004) *Creating Growth with Services,* MIT Sloan Management Review, Winter.

Slywotzky, A. & Baumgarter, P., et.al., (2006) *Are you enjoying globalization yet?,* Journal of Business Strategy Vol.27 NO.4.

Timmers, P., (1998) *Business models for electronic markets,* Electronic Markets 8.

Upton, D.M. & McAffee, A.P., *A* (2000) *Path-Based Approach to Information Technology in Manufacturing,* International Journal of Technology Management 20(3/4).

7.3 Business Magazine Articles

Affärsvärlden nr 45, (2006) *Molnet över mobilmarknaden,* Nov 13.

Computer Sweden, (2006) *Tre utmanar på mobilt Internet,* Nov 17.

Computer Sweden, (2006) *Igel har ingen koll,* Dec 15.

Computer Sweden, (2006) *Mobil-tv häftigt och kul men få vill betala,* Dec 12.

Computer Sweden, (2006) *About the evolution of the telecom industry,* Dec 1.

Computer Sweden, (2006) *Alla mot alla på mobilt Internet,* Feb 16.

Computer Sweden, (2006) *En enveten entreprenör,* Dec 1.

Computer Sweden, (2006) *Ericsson tror på 3G,* Nov 17.

Computer Sweden, (2006) *Genombrott för mobildata,* Nov 29.

Computer Sweden, (2006) *Google och Orange pratar telefon,* Dec 29.

Computer Sweden, (2006) *Hackare siktar på trådlöst,* Dec 29.

Computer Sweden, (2006) *Mobilmodet: turbo 3G i höst,* Nov 17.

Computer Sweden, (2006) *Mobiloperatörer tjänar miljarder på fiktiv kostnad,* Dec 29.

Computer Sweden, (2006) *Mobiltelefonen ersätter id-kortet,* Nov 22.

Computer Sweden, (2006) *Nokia satsar på mobil WiMax,* Dec 20.

Computer Sweden, (2006) *Nu vill alla ha mobil e-post,* Nov 27.

Computer Sweden, (2006) *Telia ska spränga 100-miljardersgränsen,* Nov 17.

Computer Sweden, (2006) *Tre skärmar bildar Ericssons värld,* Oct 25.

Computer Sweden, (2006) *Tre utmanar på mobilt Internet*, Nov 17.

Computer Sweden, (2006) *WiMax bokstavligen på gång*, Nov 17.

Computer Sweden, (2007) *Hetast på Cebit – skarvlösa nät*, Mars 16.

Computer Sweden, (2007) *Klädshoppa vituellt via mobil*, Mars 16.

Computer Sweden, (2007) *Mobilkameran läser rutkod*, Mars 16.

Computer Sweden, (2007) *Skype utmanar i Stockholm*, Mars 16.

Computer Sweden, (2007) *Så smyghöjs din mobilavgift*, Jan 5.

Computer Sweden, (2007) *Mobile Content Aftonbladet*, Jan.

Ny Teknik, (2006) *Premiär för turbo 3G i Sverige*, Nov 15.

Ny Teknik, (2006) *Ring billigare med IP*, Nov 29.

Ny Teknik, (2006) *Uppfinna mer*, Sep 13.

NyTeknik, (2006) *Ring billigare med IP*, Nov 29.

SVD, (2006) *Fast pris 3:s modell för mobilt Internet*, Nov 17.

TT, (2006) *Koppla inte av, koppla ned*, Dec 9.

Veckans Affärer, (2006) *18 miljarder ska bort – nu eller aldrig för Tres VD*, Nov 9.

Veckans Affärer, (2006) *Hon är telejättarnas mardröm*, Aug 31.

7.4 Internet Articles

www.di.se, (2007) *Nokiastrul sinkar Telenors bredbandsmobil*, Feb 12.

www.dn.se, (2006) *Bredband, TV, telefoni från samma håll*, July 17.

www.ft.com, (2006) *The Mobile Internet*, Nov 16.

www.ft.com, (2006) *Mobile devices: What are we meant to do with all this?*, Oct 4.

www.timesonline.co.uk, (2006) *3 finds the right way to do mobile Internet*, Nov 19.

www.e24.se, (2007) *Google telefonen blir verklighet*, Mars 16.

www.realtid.se, (2006) *Het debatt om mobilens fram tid*, Oct 26.

www.sl.se, (2007) Jan 18.

www.svd.se, (2006) *3 satsar på fast pris för mobil Internet*, Nov 17.

7.5 Web-sites

www.aspiro.se Jan 2007.

www.bemi.se Dec 2006.

www.di.se , Nov 6 2006.

www.di.se, 05/01-2006.

www.di.se, Jan 5 2007.

www.di.se, Jan 11 2007.

www.disruptivewireless.blogspot.com

www.gigaom.com/2007/02/09/vodafone-mobile-content/#more-8125 Feb 9, 2007.

www.pts.se Dec 2006.

www.pts.se Feb 2007.

www.spinbox.se Jan 11 2006.

www.svd.se Nov 17 2006.

www.telco.net/blog "Telco 2.0 Survey Update", Nov 13 2006.

www.telenor.se, Jan 2007.

www.telenor.se, Oct 19 2006.

www.totaltele.com/View.aspx?ID=86620&t=4, Oct 2006.

www.totaltele.com/View.aspx?ID=87003&t=4, Oct 24 2006.

www.virgin.com/gateways/mobile/, Jan 2007.

www.voipandenum.blogspot.com

www.wikipedia, Jan 9 2007.

www.wikipedia.com, Dec 2006.

7.6 Interviews

Jan Nilsson. 2006 Business developer, Labs 2, Nov 29.

Mark Klefter. 2006 CTO and co-founder, Conveneer, Nov.

Paul Singham. 2006 International voice solution consultant, Britsh Telecom, Dec 18.

Per Månsson and Johan Jobér. 2006 President and CTO, Nordisk Mobiltelefon, Dec 8.

Richard Lindberg. 2006 CEO and co-founder, Conveneer, Nov.

Richard Woodward. 2006 CFO, 3, Dec 5.

Thomas Schyffert. 2007 Strategic analyst, Telia Sonera, Jan 16.

Anders Staaf, 2006 Senior Consultant, Telemanagement AB, Dec 18.

VIII. Appendix

8.1 Mobile Acronyms [247/248]

-3G: Short for Third Generation technology, 3G-mobile phones provide the ability to transfer simultaneously both voice data (telephone call) and non-voice data (downloading, e-mailing, instant messaging and video telephony). Built on the wcdma-standard the 3G systems are very expensive, complex and exhaustive.

-W-Lan: Wireless Local Area Network. It consists of a cheap and simple radio-technology that allows a high capacity transfer of data over short distances unless the connected device is in movement. W-Lan is the underlying technology of the brand WiFi , Wireless Fidelity.

-Hotspot: An area covered by W-Lan, or labelled by WiFi, within which it's possible to go online using for example a laptop, a PDA or an advanced mobile phone.

-WiMax: Worldwide Interoperability for Microwave Acces is a radio-technology originating in IT with high capacity for transfer of data over long-range distances.

-VoIP: Voice Over Internet Protocol or IP-Telephony is the routing of voice calls using the "public Internet" or another IP-based network instead of operators telephone networks. VoIP to VoIP calls are typically free, while VoIP to non-VoIP calls are generally charged but cheap.

[247] www.wikipedia.org Oct 25 2006.
[248] Torbjörn Carlbom, "Hon är telejättarnas mardöm: Snabbguide till IP-djungeln", Veckans Affärer, August 31 2006.

-MVNO: A Mobile Virtual Network Operator does not own a network but resells wireless services under their own brand name using the network of another mobile phone operator.

-PDA: Stands for Personal Digital Assistant and is an electronic device which can include some of the functionality of a computer, a cell phone, a music player and a camera. Many PDA:s can access the Internet through the major networks. One of the most significant PDA characteristic is the presence of a touch screen. Well known examples of PDA:s are Palm Pilot, Windows Media PC, Blackberry and Treo.

8.2 Interview basis

8.2.1 Interview with Jan Nilsson, Business Developer at Labs2, Nov the 29th 2006. *(Same interview basis used for the interview with Per Månsson and Johan Jobér, Nordisk Mobiltelefon AB, Dec 8th 2006.)*

- What is Labs2 working with? Develop networks or application to be used within networks?
- How will you describe the competition and the market structure within the network industry? Leading standards, WiMax vs 3G ?
- Do you cooperate today with mobile operators?
- Do you see any threats from mobile operators on your business? Or potential partners?
- What kind of business and partner opportunities do you see with mobile operators in the future?
- Due to mobile operators spreading over the industry boundaries through bundling/convergence, do even you have interest of new possibilities over the boundaries?

- What possible changes do you see in a near future within telecom industry, in a five years perspective?

- In which way do you think the source of income for mobile operators will change, due to the shift to VoIP?

8.2.2 Interview with Richard Woodward, Financial Director at 3 Sweden, Dec the 5th 2006

- How would you describe the current competition in the mobile industry? In which ways do you expect it to change during the coming five years? Will there be more or fewer actors involved?

- What do you think of the recent developments in wireless Internet? Which network is likely to dominate? (3, Wi-Fi, Wi-Max, HSDPA…?)

- Do you consider other enablers from related markets, like cable operators (for ex: ComHem, Spray, ViaSat), as a future threat or competitor?

- Is it likely to expect new or enhanced opportunities of cooperation with actors from related or non-related markets? (for ex: Internet/content providers / communities, different media or entertainment businesses)

- What can an actual operator/carrier do in today's situation in order to anticipate a shift towards wireless services such as All-IP voice traffic?

- Is 3's latest investment in the X-series such an action?

- How do you expect the evolution of 3 and its X-series over the next 5 years?

- Since most operators are planning to go All-IP in the longer term, how could 3 be able to transfer the Skype feature from being and added-on free service to a main integrated activity?

- What are your predictions concerning mobile TV? Is it an interesting new segment or does it lack potential for revenue or profit?

- Which type of added services could you offer or develop in relation to the convergence between wireless networks and mobile devices?

- How do you plan to integrate such services within the overall offer in regard to the existing pricing structure? Operators traditional VS free culture on the web?

- Do you think the actual pricing structure could be persistent in the long term? Is it applicable?

- If not, how can a future pricing model eventually be designed? (Flat-Rate fees?)

- Which elements of today's value chain are the most profitable? How is it likely to change in the future? Do you predict a probable value migration towards another component of the value creation process? (for ex: richness of content?)

- Where do you think 3´s income sources will be tomorrow? (Service offering? Advertising incomes?)

- Is it likely to expect the future operator to be an overall content-provider? (Streaming Tv etc?)

- Which elements of the future value chain will surely turn out to be profitable?

- What would you consider as an effective way of attracting the customer of the future? (Price, quality, subventions, features etc…)

- What would the main focus be? Aimed at more customers or higher margin and profit per customer?

- In your opinion, what will be the critical factor of the customer when choosing his operator in the future? Accessibility, price, service?

8.2.3 Interview with Paul Singham, International Voice Solution Consultant at BT, Dec the 19th 2006

- How would you describe, the current market situation in the telecom sector, especially the cell-phone market?

- What will it look like in 5 years?

- Toward which path/direction is the mobile marketing running to? Future trends?

- What do you think about the evolution of network–standards like: WiFi, WiMax

- What do you think aboiut the different networks as: HSDPA, WiFi and HSDPA?

- How will BT tack advantage and anticipate to this diverse development?

- As your expertise about VoiP, could you describe us the advantage and the risks of this new communication tool?

- How will mobile operators do to have sustainable incomes?

- What will be the factors that will attract & sustain the customers?
  -Quality
  -Net-access
  -Price
  -Bundling
  -Customer-service

- Can a" lock-in" strategy be successful, like Triple-play?

- What do you think will be the most profitable services/products in 5 years?

- What do you think about "3"s launching of Skype in their mobile phones?

- Has BT a similar project, to develop VoIP- application for cell-phones?

- Internet seems today as "free culture"-provider, where you can communicate, inform yourself, etc. almost free. In according to the entrance of Internet in the mobile phone, what can operators do to make mobile-interesting/attracting for the customers?

8.2.4 Interview with Tomas Schyffert, Business Analyst at Telia, Jan the 12th 2007

- How would you describe the telecom industry's current situation and the future (in 5 years) within the mobile?

- What will it look like in 5 years?

- Toward which path/direction is the mobile marketing running to? Future trends?

- What do you think about the evolution of network–standards like: WiFi, WiMax, HSDPA? WiFi versus HSDPA ?

- How will operators profit of these new evolutions?

- Telia is today a big actor within the telecom industry. You have both mobile solutions, fixed phones and Internet solutions. Do you have an advantage of being active in these three areas? Could you take part of your knowledge and customer-base?

- Within the Swedish market, you tend to be the most expensive of the operators. How will you do to meet the tough and the future price press

  -Service
  -Quality
  -Coverage
  -Customer-service
  -Network

- What do you think will be decisive in the future when the customer will choose an operator?
  -Services
  -Quality
  -Coverage
  -Customer-service
  -Price
  -Bundling of network
  -Application
  -Network

- Which services/products are the most profitable today within mobile Telia Business? Which will it be in five years?

- What do you think about 3´slaunching of Skype in the mobile-phone? Do you have any similar projects?

- How will you charge for the diverse services?

- Internet is today characterized as a ”free culture” where communication and get informed is delivered on free-basis. In tact with Internets entrance in the mobile-phone, what can mobile operators do to make mobile-Internet attractive?

- Which role will Teia have in the future? Network, application, service – provider?

- Will you create partnership with famous brands, as Orange and Google?

8.2.5 Interview questions with Anders Staaf, Senior Consultant at Telemangement, Dec 18th 2006

- How would you describe the current situation and the future (in 5 years) within the mobile-phone market?

- Which are up to you the current signs of future trends within the mobile industry?

- How do you see on new network-standards and theirs potential (WiFi, WiMax,HSDPA, CMDA450)

- What will be decisive factors for the customer when choose the mobile operator?

- Which competitive advantage will be decisive in this case?

- How will you describe the primary mobile operators’ strategy? Do you think they are suit for the future?

- Is it probable that new actors will step in the mobile industry?

- What do you think will be the future source of income for mobile operators?

- What do you consider about mobile TV services potential? Central source of income?

- Is it probable that the mobile operator in the future transforms to a global content provider? (Media, Tv, Internet-services etc…)

- Internet is today characterized as a ”free culture” where communication and get informed is delivered on free-basis. In tact with Internets entrance in the mobile-phone, what can mobile operators do to make mobile-Internet attractive?