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Future Mobile Internet Services: Business Model Scenarios

by

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THE ECONOMICS OF TELECOMMUNICATIONS
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PREFACE

This report is a part of a project funded by The Research Council of Norway, Telenor, Den Norske Bank, A-Pressen, Ericsson, and EasyPark. The project is headed by Professor Leif B. Methlie at NHH/SNF, and is called “Mobile and channel integrating electronic commerce – business models and end-user adoption”. This work reports on the business strategic sub-project, and presents possible business models in distinctive future situations that are relevant for businesses operating in the mobile commerce industry. The report is based on a scenario workshop with participants from the research consortium (NHH, HiA, SNF, Telenor, DnB, and A-Pressen) and a few other actors in the mobile commerce industry (TV2, NRK, and Geodata).

The scenario analysis and the construction of the scenarios are done by Research Scholar Leif Jarle Gressgård and Associate Professor Inger Stensaker. Professor Leif B. Methlie has contributed to the business model literature review and the scenario methodology.

Bergen, June 2004

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ABSTRACT

In this report we explore future business models for mobile internet services. Based on four different scenarios, we sketch out how future conditions in the mobile industry may influence business model elements. The business model framework is defined as consisting of (1) core value proposition (2) value network (3) financial aspects.

The four scenarios vary along two dimensions - *technological development* and *social identity*. Technological development refers to the degree of technological standardization and interoperability, and we distinguish between technological convergence and technological divergence. Social identity has to do with value orientations at societal, organizational, and individual levels, and we distinguish between individualistically oriented values and values that focus on collective principles. Different combinations of these two dimensions provide us with four scenarios where quite different business models can be expected.

Managerial implications within the four scenarios are discussed, but more importantly, we present managerial implications that cut across the four scenarios with relevance for all four future conditions. The most important implications are the need for market knowledge and customer focus. Businesses that aim at creating a competitive advantage in the mobile industry must apply a customer centric perspective, and through this gain knowledge of current and potential customers' preferences. Another important aspect is the need to strategically select business partners. Rapid technological development and the need for service complementarities increase the importance of interfirm relationships. Managers should therefore carefully analyze what kind of resources (e.g. knowledge) they need for creating and fulfilling customer values. They should also use this information to assess which business partners may be advantageous or necessary in order to achieve a competitive advantage.

1 INTRODUCTION

1.1 Background

The information and communication technology (ICT) industry has experienced tremendous developments in the last five to ten years. This is particularly true for the telecommunications sector, which remains in constant change. This necessitates reliable and advanced technological solutions aimed at meeting the needs and demands of the customers. As the market for voice communication has become rather mature, Internet services via wireless networks have now attracted the attention of actors in the mobile industry.

Mobile commerce can be defined as *"e-commerce (e-business) activities relying solely or partially on mobile e-commerce transactions"* (Tsalgatidou and Pitoura, 2001: pp. 221). Mobile Internet Services are particularly well-advanced in Scandinavian countries, which represent some of the most highly developed telecom markets in the world. The success of mobile telecommunications (i.e. voice communication and SMS) in the Scandinavian countries is largely based on rapid adoption and application of new technologies, and a tradition of both collaboration and competition between actors in the telecom sector. However, the mobile phone as an access channel to more complex data services has not been a success. We believe that this is likely to change.

In a mature voice market new services must be generated. The most successful services over wireless networks today are SMS-based, but there is an indefinite potential for value creation and revenue generation thorough new and innovative services that take advantage of the inherent unique capabilities of wireless networks and mobile devices. That is, by serving users anywhere and at anytime mobile commerce can add new capabilities to the existing e-

commerce markets that can only be accessed from fixed locations such as homes or offices (Gressgård et al., 2003).

Three unique characteristics of wireless devices over computers and other conventional platforms have been proposed by Kannan, Ai-Mei Chang and Whinston (2001), and Yunos and Gao (2003). First, they argue that wireless devices are accessible, meaning that mobile phones are portable and available for users at any and all times. Second, mobile phones are personal because they carry the users' identities and by this make personalization easier. And third, it is possible to identify the users' physical location at any time. Hence, in addition to the characteristics of electronic commerce, mobile electronic commerce involves different technological opportunities and challenges. M-commerce has the potential to provide location-specific services, but due to the limitations of the user interface in terms of size, resolution, and browsing, personalization and/or customization becomes increasingly important (Tsalgatidou and Pitoura, 2001: pp.224). Mobile services may also be characterized by ubiquitous-, universal-, and unison access as well as uniqueness, and Watson, Pitt, Berthon, and Zinkhan (2002) introduce the concept of "u-commerce" to describe these services.

So what does the future hold regarding mobile services? What are the prospective developments and challenges of the telecom sector, and what types of services will be demanded? And how can the involved business actors organize themselves in order to meet future demands? These are the issues we focus on in this report. Based on a business model framework, we discuss alternative future scenarios for the mobile commerce industry within the next five to seven years. The analysis of future mobile scenarios is based on data from a workshop with industry experts.

1.2 Overview of the report

The report is organized as follows: In chapter 2, we present a review of the literature on business models in electronic and mobile commerce and we develop a definition of the concept. In doing this, we outline the business model elements that we use to structure our scenario descriptions. In chapter 3, we present the methods used in this study. Data from our workshop with industry experts are presented in chapter 4. By synthesizing the data we extract two aggregate dimensions, which create the basis for our developing scenarios. Hence, chapter 3 and 4 together consist of our empirical foundation. Chapter 5 contains a theory-based description and definition of the two dimensions: technological development and social identity. Four scenarios are presented in chapter 6, with focus on the business model elements core value propositions, value network, and financial aspects. We conclude the report with practical implications of our research and suggestions for future research.

2 LITERATURE REVIEW: BUSINESS MODELS

The *business model* construct has increasingly been used to describe new ways of doing business, particularly within the field of electronic and mobile commerce, but also in the more general strategy literature (Hill and Jones, 2004). While the term tends to be used as if there is wide agreement on what it actually means, there exist no widely agreed upon definition of what properties a business model consists of, nor a clear view of how business models are created, evaluated and sustained (Voelpel et al. 2003b). In this section we review different ways in which the construct has been used and defined in order to develop a definition that is useful for our purposes – that is, within a future m-commerce context.

One of the first definitions of a business model in the e-commerce context was provided by Timmers (1998). His definition states that a business model is *"an architecture for the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; and a description of the sources of revenues."* This definition includes a description of four properties: (1) the product/service flow (including information flow); (2) the business actors and their roles; (3) the potential benefits; and (4) the sources of revenues. It covers *what* the business idea is, *who* is involved in creating values, and *how* values are created, claimed and shared. Examples of generic business models in the early days of electronic commerce include e-shops, e-auctions, and virtual communities (Timmers, 1998). After the dotcom bubble burst, however, more focus has been put on business processes more generally in all enterprises, both upstream (supply chain) and downstream (customer relationships) (see for instance Weill and Vitale, 2001). One of the strengths of the business model definition by Timmers (1998) is that it is generic and therefore can be applied

to any business idea. It also differentiates a firm's business model from its strategy since the strategy not only includes how values are created but also focuses on how one particular firm aims to compete with other firms in the industry. The weakness of this definition, however, is that it is descriptive and gives no normative guidance with respect to what strategic options to choose in order to increase value creation and performance. Methlie and Pedersen (2002) have related structural determinants to vital business model decision options in an attempt to be more normative.

Several other business model definitions include the same basic properties as Timmers, but with slight variations. According to Bouwman (2002), a business model provides: (1) a description of roles and relationships of a company; (2) a description of customers, partners, suppliers; (3) a description of the flow of goods, information, money; and (4) the benefits involved (especially for customers). This definition emphasizes the *customer* to a greater degree than the previous definition. New customer values that can be generated by Internet properties in e-business models have also been emphasized by Methlie (2000). He uses a framework presented by Rayport and Sviokla (1994) consisting of three components: content, infrastructure, and context, to develop a set of customer values on each of these three components.

Business model research in the mobile context has also focused on the restrictions on choice of business model due to structural determinants and value network considerations. Methlie and Pedersen (2002) included three operational dimensions in their business model concept: integration model, collaboration model and revenue model. Here, the focus is less on the value proposition and more on the infrastructure elements of the model stressing that individual actor's business model options are restricted by *structural determinants and value network considerations* because value creation in both

traditional and mobile electronic commerce requires a shared understanding of the business model of each network member. In fact, in some industries, the business model options of each network member are indirectly determined by the business model of the dominant value network members (e.g. operators in some mobile services industries and operating system developers in the PC-software industry). Petrovic (2001) points to the processes behind value creation in his definition of business models as "descriptions of the logic of a "business system" for creating value that lies behind the actual processes". However, if processes are understood as the flow of goods, information, and money, then this definition does not necessarily add anything since this was also covered in the definition by Bouwman (2002).

There are other researchers who view business models as more closely related to a firms' business strategy and these definitions include competitive aspects and internal firm competencies in their definitions (Viscio & Paternack, 1996; Hamel, 2000; Tsalgatidor & Pitara, 2001; Camponovo & Pigneur, 2002; Osterwalder, 2002; Matredevan, 2002; Voelpel et al. 2003a). Christensen and Methlie (2003) relate business models to strategy in an empirical study of value creation in e-business. They claim that e-business value creation is slow because enterprises have failed to emphasize strategic alignment, business transformation, and business process redesign. Voelpel et al. (2003a) go even further into the strategic domain in their definition of business models by including the firm's leadership and governance, as well as a requirement of sustainability: *"The particular business concept (or way of doing business) as reflected by the business's core value proposition(s) for customers; its configurated value network to provide that value, consisting of own strategic capabilities as well as other (e.g. outsourced/alliances) value networks; and its leadership and governance enabling capabilities to continually sustain and reinvent itself to satisfy the multiple objectives of its various stakeholders."*

Several of the definitions of business models have been developed particularly for the m-commerce context. Business models for m-commerce have for instance been said to need to take into account: core competencies, characteristics of m-commerce, the context in which mobile terminals are used, internet e-commerce models, market needs, other players and actors in the field, previous success stories (Tsalgatidor & Pitara, 2001). Properties here include internal competencies and competitors – or other players in the field, which have traditionally been tied to a firms' choice of strategy. On a similar but more specific note, Camponovo & Pigneur (2002) argue that business models in mobile contexts consist of four pillars (the last three pillars have also been proposed by Osterwalder, 2002):

1) Product innovation – related to the offering of the firm. Products/services, how it differentiates itself from competitors. How the firm creates value.

2) Customer relationships - who the customers are. Target customers, distribution channels, customer relationships.

3) Infrastructure management - value configuration, value chain, in-house capabilities and resource partner network.

4) Financial aspect – revenue model, cost structure, profit and loss.

Again, this definition includes descriptive and strategic factors concerning the firms' internal capabilities and how the firm can differentiate itself from competitors. The other properties however, are very much in line with Timmers (1998) early definition and other definitions emphasizing value streams, revenue streams and logistical streams (Matredevan, 2002). Although developed for the mobile context, the definition does not seem to include anything which would make it less suitable for other contexts. Both

Camponovo & Pigneur (2002) and Voelpel et al. (2003a) stress that business models should not only describe products or services, but they should involve innovative features, either in terms of product innovation (Camponovo & Pigneur, 2002), new customer value propositions, or the ability to constantly reinvent itself (Voelpel et al. 2003a).

2.1 Developing a definition of business model

In drawing up business model scenarios for mobile commerce, we are concerned with describing the characteristics of the products and services that are likely to be on the market in the various future scenarios (core value proposition), how firms organize to produce and deliver those products (value networks), and the cost structures actors are faced with (cost model). When linked with research on current business models, these business model properties should provide insight into other relevant business model properties such as who is likely to have influence in the value network (value network influence), and what kinds of revenue models are likely to be used (revenue model). For our purposes then, a modified definition based on Timmers' (1998) early description of business models (the product, service and information flows; the business actors and their roles; the potential benefits for various actors; the sources of revenues) seems suitable.

As mentioned, more recent definitions have emphasized customer focus, strategic components such as competitiveness and internal competencies, and product or value proposition innovation or constant reinvention. We believe that only the first of these is important in our analysis of alternative mobile business models for the future. A business model definition must focus on values created for the customers. This is linked to the assumption that only business ideas that create values for the customer will prosper and survive.

Although we are concerned with identifying new business ideas for the future, the business model construct does not need to include the properties of newness and innovativeness. On the contrary, we believe the business model construct should be useful as a description of both new and existing business ideas. Furthermore, we find the construct more useful when it is differentiated from a firms' strategy because that will allow us to speak about business models as similar across many firms in an industry, although they may choose to compete differently (i.e. different strategies).

Based on the discussion above, we will define business models along three dimensions, each dimension containing a set of decision options for strategic actions of each actor of a value network:

- The **core value proposition** for target customers in terms of the specific product-/service-attributes offered;
- The infrastructural arrangement of the **value network** focusing on who is involved in value creation and the linkages between actors in the network.
- The **financial aspects,** particularly focusing on cost structure, but with a long-term aim of predicting revenue models as well.

This definition allows many firms to be based on the same business model, but it also allows many firms to contribute to the same business model. This is crucial since our level of analysis for the scenarios focuses on the mobile *industry*, and any industry will normally consist of many firms. Different actors in the value network will deliver different products or services and they may choose different revenue models. It is therefore not relevant to discuss specific products or services, or a particular firm's revenue model. When we present

future business models in the four different scenarios, we are therefore limiting our discussion to more generic business models at the industry level.

2.1.1 Core value proposition

The core value proposition refers to how values are created for the customers. The focus is on the service and values that are inherently tied to mobile services. In line with Pedersen and Methlie's (2004) business model dimension called service strategy, we include two main categories within the core value proposition. The first is the service value proposition, which consists of uniqueness, scope, and degree of service innovation. Uniqueness has to do with the extent to which mobile services rely on the technology's unique attributes, such as accessibility and personalization. Recall that these were among the unique characteristics of mobile services (Kannan, Ai-Mei Chang, and Winston, 2001; Yunos and Gao, 2003). Scope refers to the span or wideness of the service offerings in the market. This is related to the total number of user gratifications (Pedersen & Methlie, 2004) that mobile services in a market are able to cover. Degree of service innovation refers not to innovative business models as discussed in the previous section, but the degree to which value is created based on radically new and innovative services. A lesser degree of service innovation would be improvements in existing services for example to customize to a certain market segment. The second category is market focus. Marketers of mobile services can target market in an undifferentiated manner meaning without segmenting the market or by targeting a specific customer segment, which we will refer to as a niche focus.

2.1.2 Value network

The value network has to do with the infrastructural arrangement that lies behind value creation. Who is involved in value creation? Is it mainly new

actors or established firms? Who has influence in the value network and/or how can actors in the network gain influence? Finally, this dimension also includes the linkages between actors in the network. Can we expect to see tight or loose cooperation between network actors and why?

2.1.3 Financial aspects

The financial aspects include both the cost model and the revenue model. Choice of revenue model is likely tied to who has influence in the value network and the characteristics of the particular service. If content providers have a high degree of influence, then it is more likely that we will see content based revenue models, where revenues are based on the unit of service content delivered (Pedersen & Methlie, 2004). This is because content based revenue models leave content providers a relatively larger share of the revenues (Pedersen & Methlie, 2004). If, on the other hand, network providers are more influential, then we are more likely to see transport-based revenue models, where the customers pay for the amount of time online. The transport-based revenue model leaves the network or transport providers with a relatively larger share of the revenues (Pedersen & Methlie, 2004). On a similar note, if a particular service is time-consuming, it seems likely that the preferred revenue model is transport-based. As mentioned, we will not be identifying specific influential actors, or specific mobile services. We thereby have little information on which to base revenue model predictions at the industry level. Drawing on strategy literature however, we can make some predictions concerning cost structure, at least in terms of whether the cost structure at the industry level is likely to be high or low. Revenue models are even more difficult to predict. However, as current and future research reveals the determinants of different revenue models at an industry level, these can be

applied to our scenarios in order to develop this last dimension of the business model.

In summary, there are a number of different definitions for business models. Most of them include the following dimensions: the product, service and information flows; the business actors and their roles; the potential benefits for various actors; the sources of revenues. More recent definitions have emphasized customer focus, strategic components such as competitiveness and internal competencies, and product or value proposition innovation or constant reinvention. We are studying business models at the industry level and for our purposes we have defined business models as consisting of: the core value proposition for the customer; the value network; and the financial aspects. The choices within each of these dimensions are summarized in the table below.

Table 2.1: Business model components

Business Model Dimension	**Components**	**Key questions**
Core value proposition	a) Service value proposition • Uniqueness • Scope • Degree of innovation b) Market focus	How is value created? Are services based on accessibility and/or personalization? Extent of user gratifications? Is value created through service innovation or improvement? For whom is value created? Target market?
Value network	a) Actors b) Influence c) Network ties	Who creates value? Who has influence/how can influence be gained? Are there strong or weak linkages between actors?
Financial aspects	a) Revenue model b) Cost model	How are revenues collected and shared? High or low cost structure?

3 METHODS

This chapter presents the design of our study and describes how data were collected and analyzed. In assessing future business models for mobile internet services, we chose an exploratory design where we relied on a combination of industry experts and existing research within the mobile and e-commerce literature, innovation literature and strategy literature.

3.1 Research Design

We conducted an exploratory study to address our research question. Predicting how mobile internet services will be organized in the future requires insights into a number of issues, some of which were not readily available in existing literature. Our study required that we: (a) establish a suitable definition of business models; (b) identify current business models in the mobile internet industry; (c) identify the main drivers of the industry; (d) select two scenario dimensions based on the most important and most uncertain drivers of the industry; (e) describe situation characteristics of the four extreme points of the two dimensions, (f) present future scenarios based on the four possible combinations of the two dimensions; and (g) assess how the future scenarios are likely to affect the choice of business models.

Existing literature was consulted to define business models (a) and to describe and develop the two dimensions on which to build scenarios (d and e) as well as to assess how future scenarios might affect business models (g). Based on this we were able to present four different future scenarios (f). Current business models (b) were identified based on in-depth knowledge about the context, which in turn was based on previous studies and data collection. In order to identify the main driver of the industry (c), we used data from industry experts.

3.2 Data Collection

Data used to identify the main drivers of the industry were collected through a two-day workshop with industry experts. We invited six companies who were offering mobile internet services at the time. The companies represented a mix of content providers, service and platform providers, and mobile operators. Nineteen people participated in the workshop and of these five were research project members.

We placed managers from the different corporations in groups based on the main focus of their company's or division's services. The groups focused on either transaction services, entertainment service, or information services. One or two members of the research team participated in each of the groups and took notes.

We asked the industry experts to identify the driving forces in the industry. The groups were instructed to use PEST analysis to draw up the political, economic, societal, and technological forces. They also used Porter's five forces model to identify customers, suppliers, potential entrants, substitutes, and competitors. These analyses were mainly performed to get the groups started in thinking about main drivers in the industry and to organize some of the answers they came up with.

Once all possible drivers were identified (using post-it notes), the groups were asked to assess the strength of each of these forces and to rate each of the driving forces in terms of importance and uncertainty. Driving forces that scored low on importance were eliminated. The factors that scored high on importance and low on uncertainty were to be included in all future scenarios. Only the drivers that scored high on both importance and uncertainty were used

in the final round to settle on the two dimensions that would create the basis for developing future scenarios. These factors represent the data for our study.

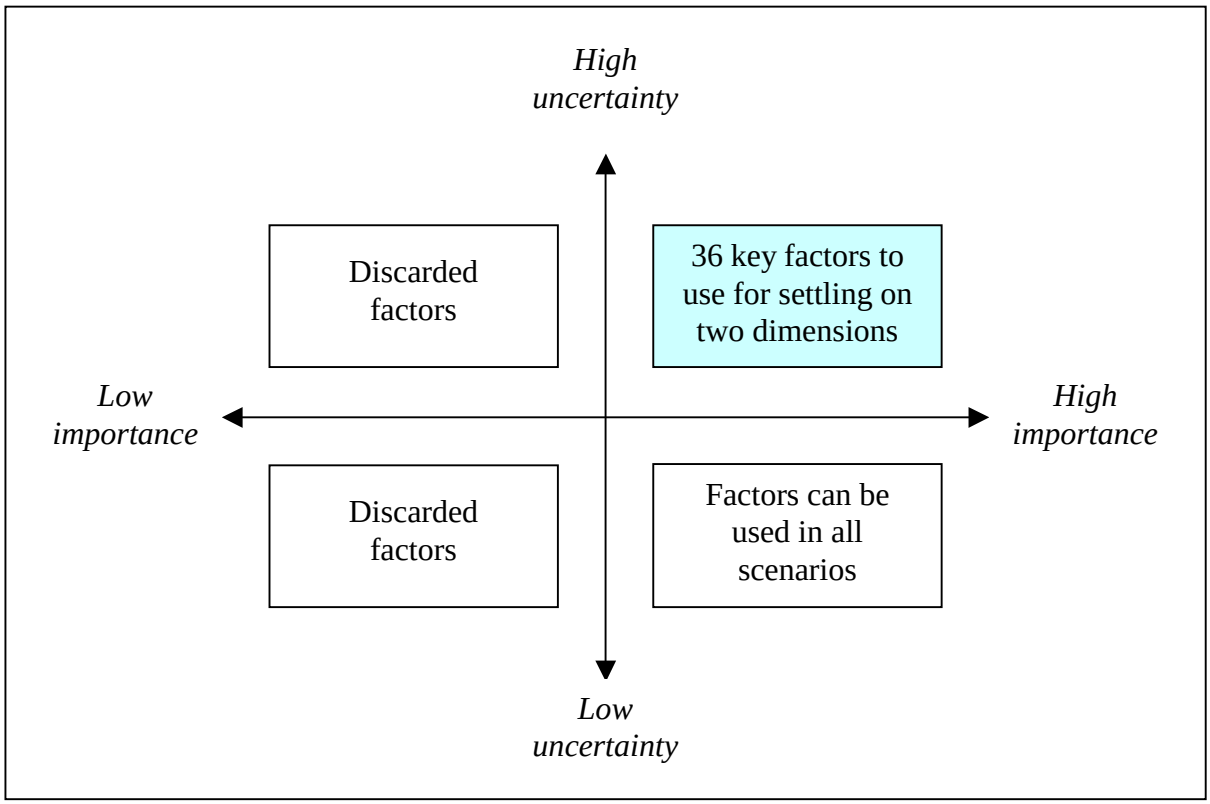

Figure 3.1: Relevant factors in scenario building

The groups continued their work by developing scenarios based on the two main dimensions. Although the groups had come up with slightly different dimensions, their scenarios were developed on fairly similar themes. Several of the scenarios were quite interesting, however, we chose not to include the final scenarios of the expert groups in this study. One reason for this was that the groups did not have enough time to adequately develop the future business models, particularly in terms of how future services might be organized. Much of the focus was on future products and services, some of which were heavily

influenced by already existing services. Another reason for not using the final scenarios is that we wished to draw on theory in our development of future business models.

Hence, for this report, our main source of data consists of the driving forces that the groups rated as high on both uncertainty and importance. We asked the groups to pick out the top 10-forces. Some of the groups reported more than the top ten and we therefore ended up with 36 driving forces, which create the basis for our study. The 36 driving forces that were rated high on both importance and uncertainty by the three expert groups are presented in the next chapter.

The purpose of having research project members participating in the groups was to get more in-depth information about the discussions behind the 36 driving forces that were presented as summary bullet points. The notes and recollections by the research members are therefore also included in our data material. These data were crucial in order for us to synthesize the many driving forces into two dimensions as we needed to evaluate the degree to which the factors were overlapping and related.

3.3 Data Analysis

The 36 driving forces were analyzed based on their underlying meaning. Since many of the forces were summarized in one word, this required discussions among the researchers in order to grasp what the groups had actually been referring to. By comparing and contrasting the driving forces we were able to group the 36 factors into five main issues: value chain organization; law and government regulations; financial aspects; technological development; social identity. The data were thereby reduced to five categories of forces, which we refer to as aggregate dimension. We then chose two of these five aggregate dimensions as the two main dimensions for our scenario development:

technological development and social identity. The choice was based on our assessments of what constitutes main drivers in an industry. We argue that some of the aggreggate dimensions that were raised are not drivers of the industry but rather consequences of other forces.

Although there were differences among the groups in terms of which factors they focused on, we chose to treat the 36 factors equally regardless of the group belonging. Hence, in reducing our data to five aggregate dimensions, we did not require that all groups contributed with factors in order to consider a dimension.

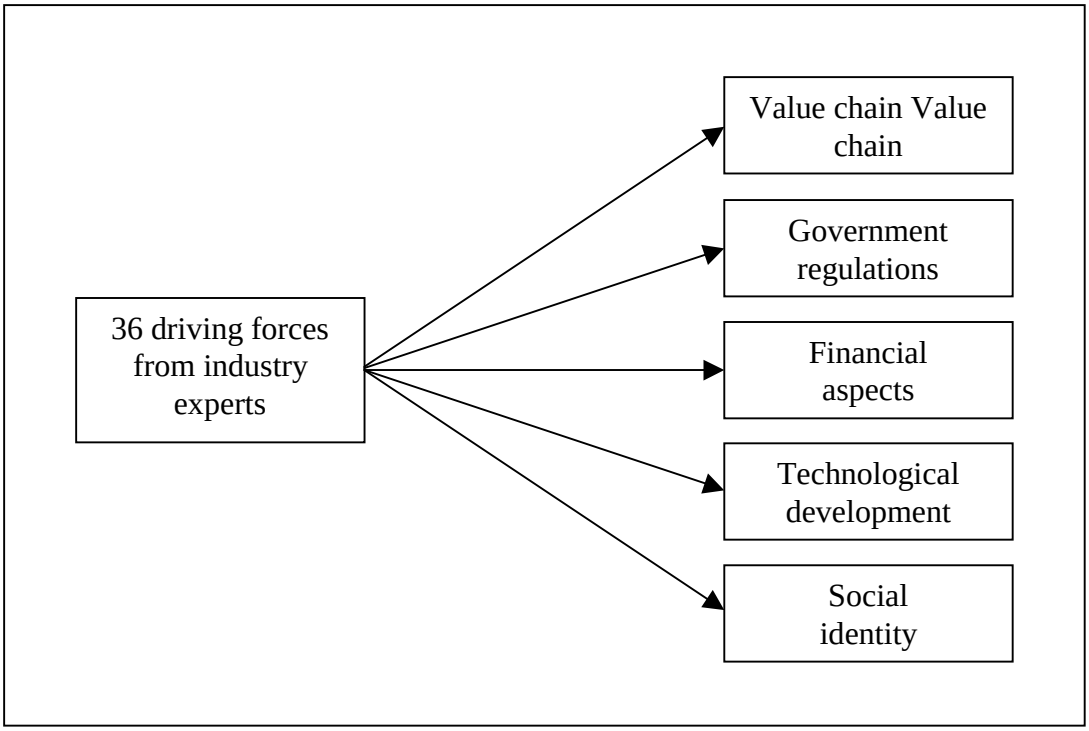

Figure 3.2: Aggregate dimensions

The two aggregate dimensions that we deduced from the workshop data were subsequently used to develop four scenarios that illustrate possible future business models for mobile electronic commerce. In order to illustrate how the four worlds will differ for the businesses that have to operate in these

environments, the business model framework with the defining elements of (1) core value propositions (2) the value network and (3) financial aspects) was applied.

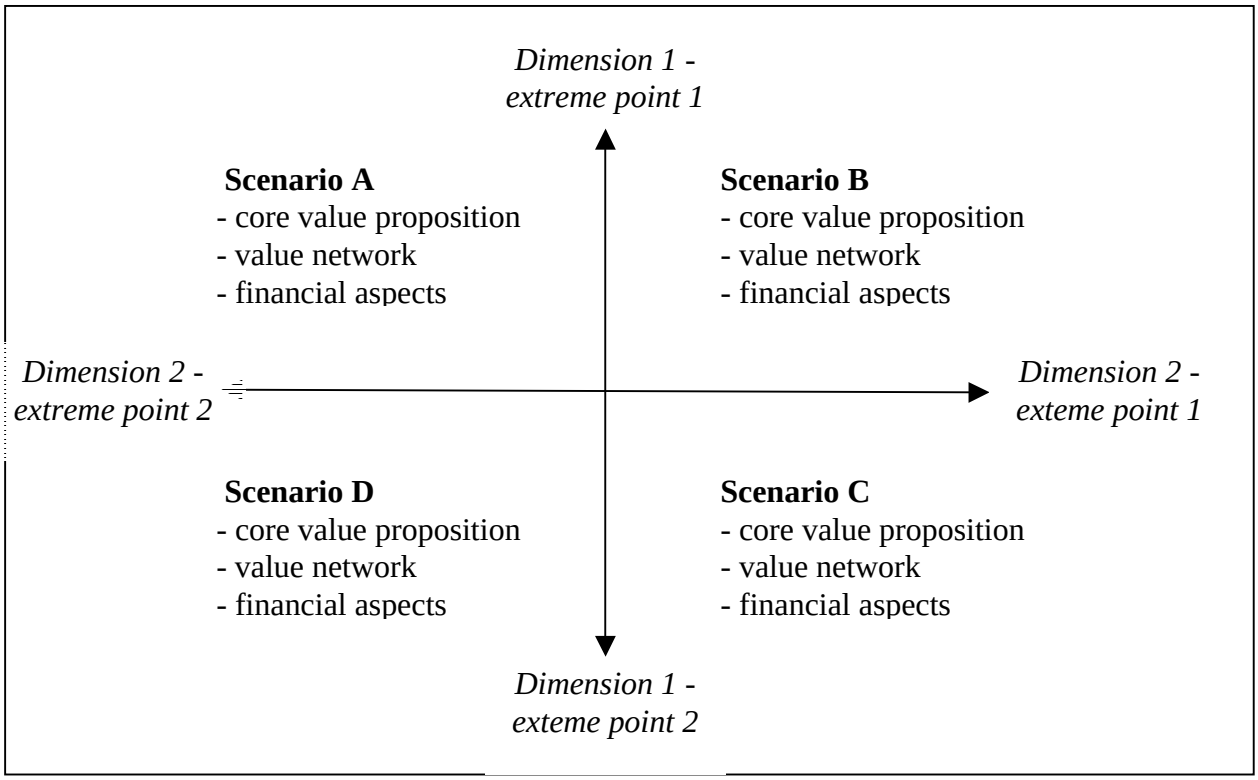

Figure 3.3: Use of selected aggregate dimensions in scenario building

3.4 Methodological strengths and weaknesses

Predictions about the future are risky and difficult. The scenario approach does not aim to make predictions however, but rather can be used as a tool to describe possible and plausible future situations which can help strategic thinking today. The strength of using industry experts in scenario development

is that they possess in-depth and specialized knowledge about the context. Because of their in-depth knowledge about the past and the present conditions of the industry, their abilities to think creatively about future situations could of course be hampered as well. This is why it is important to draw on theory as well as expert opinions. Using theory in the development of scenarios can also contribute in making the scenarios more well-founded.

While the workshop setting facilitated collection of both expert data and in-depth observational data, there are at least three aspects which may have affected the quality of our data. First, the groups consisted of members from different organizations, and their views may thus be biased by their contextual background. Further, since this is a highly competitive industry there is a risk that some experts were unwilling to share their "best" and most creative thoughts about the future with potential competitors, suppliers, or customers. Since the group members came into the workshop with many different points of reference, there is also the risk that the group eliminates more controversial factors and land on factors that everyone within the group can agree on. Compromises within the groups to reach a solution on limited time may thereby affect the output. Secondly, in giving the groups Porters 5 forces and the PEST analysis, we may have restricted their ideas about future driving forces and forced them into factors that are easily placed within these traditional strategic tools. Finally, there is always the chance that research project members, as participating members of the work groups, influence the experts and that the results are more based on the researchers' views than the expert views.

In the next chapter we present our data and the process leading us to two scenario dimensions.

4 PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

The objective of this chapter is to use the workshop data to create two aggregate dimensions that will constitute the basis for our scenarios. In doing this, we first evaluate all factors that the groups considered as highly important and highly uncertain, and look for common elements. Thereafter, we present and justify the two constructs that incorporate the most important driving forces in the mobile industry.

4.2 Presentation of workshop data

The factors or driving forces that the respective groups found most important and uncertain are listed below:

Table 4.1: Driving forces from all groups

Information group	*Transaction group*	*Entertainment group*
1. Competition in distribution (open distributive trades) 2. Simplicity 3. Pricing (models) 4. Network standards 5. Quality of presentation 6. Protection of privacy (positioning) 7. Sponsoring/advertising 8. Number of customers/ willingness of payment 9. Revenue sharing 10.Health-related consequences of radiation	1. Time of maturity (adoption) 2. (Possibility of) value chain control. Customized devices 3. National and international regulations 4. The technological situation 5. Standardization (technological) 6. Perceived usefulness 7. Easy access to money 8. Network effects 9. Business models. Profit sharing 10. Mobility 11. European law. Focus on competitiveness 12. Convergent development 13. Health issues 14.Standardization (political)	1. Earlier youth – later grown-up 2. More self realization 3. More individualization/the renaissance of niches 4. Network effects and the reference group's use of technology 5. The distinction between work and leisure time blur 6. Desire to always be updated 7. Porn/"hackney" and triviality, and more tabloid 8. The trends are getting stronger and shifting faster 9. The importance of brands 10. Rights/copyrights and customer contact 11. External conditions (inhibiting or stimulating) 12. Business sector sliding

The objective of this section is to synthesize (as far as possible) these 36 driving forces into two key dimensions that we will use for further analysis of future mobile services.

4.3 Analysis: Synthesis of driving forces

We compared and contrasted the 36 driving forces and returned to our notes to see the arguments behind the final "bullet points". Through this analysis we were able to group the forces into five common themes: (1) value chain organization, (2) government regulations, (3) financial aspects, (4) technological development, and (5) social identity.

The first theme, *value chain organization*, incorporates elements that may influence how the supply side of mobile services is organized. This dimension was selected as one of the final two scenario dimensions in the transaction group. The theme captures industry expert concerns about value chain control. Issues such as keeping distribution channels open and making sure that no single actor can gain control of the value chain through e.g. customized and non-compatible devices (similar to what Microsoft did) were launched as important and uncertain. If we look to the 36 factors listed above, the following factors can be related to this subject matter: competition in distribution – open distributive trades; possibility of value chain control; business sector sliding; profit sharing; and revenue models. Converging industries (called business sector sliding by industry experts) can be related to value chain organization because if industries merge, then a whole new set of actors will enter the picture. This will affect the characteristics of the merged industry, how the supply side is organized, and the types of services that are offered by different organizations. In addition, factors like profit sharing and revenue models are relevant for value chain organization. The driving forces identified by the workshop groups pertaining to this dimension are summarized in the table below (table 4.2).

Table 4.2: Driving forces: Value chain organization

	Information group	*Transaction group*	*Entertainment group*
Value chain organization	• Competition in distribution (open distributive trades). • Revenue sharing.	• (Possibility of) value chain control through e.g. customized devices. • Business Models. Profit sharing.	• Converging industries (business sector sliding).

A second dimension that can be deduced from the data is *government regulations*. This dimension incorporates a wide range of elements related to government intervention in the mobile industry. Industry experts are concerned with how government intervention and political regulations (at both national and international levels) can contribute to or inhibit technological development. Factors include: protection of privacy; national and international public regulations; European law – focus on competitiveness; political standardization; and external conditions which inhibit or stimulate industry. The driving forces identified by the workshop groups pertaining to this dimension are summarized in the table below (table 4.3).

Table 4.3: Driving force: Government regulations

	Information group	*Transaction group*	*Entertainment group*
Government regulations	• Protection of privacy (positioning).	• National and international public regulations. • European law. Focus on competitiveness. • Standardization (political).	• External conditions (inhibiting or stimulating).

A third theme among the proposed factors could be related to *financial aspects* of mobile services. Financial aspects include the supply side in terms of how revenues are generated through sponsoring and different pricing and revenue models. Industry experts also describe how finances are inherently linked to the demand side in terms of securing a critical mass, willingness to pay and adoption rates. The factors that industry experts identified which have to do with financial aspects were: pricing models and mechanisms; sponsoring/advertising; customers' willingness to pay; easy access to money; profit sharing models; and time of maturity. Financial aspects is influenced by adoption rate as the level of adoption to a great extent determines (or at least restricts) how financing of mobile services can be accomplished. Similar to the theme discussed in the last section (value chain organization), the entertainment group did not consider financial factors as important and uncertain drivers of the mobile industry.

The driving forces identified by the workshop groups pertaining to the financial situation are summarized in the table below (table 4.4).

Table 4.4: Driving forces: Financial aspects

	Information group	*Transaction group*	*Entertainment group*
Financial aspects	• Pricing (models). • Sponsoring/ advertising. • Number of customers/ willingness of payment.	• Easy access to money. • Business models. Profit sharing. • Time of maturity (adoption).	

The fourth theme is *technological development.* We placed ten of the 36 factors in this category. Technological development embraces factors relevant

for the *overall technological development*, including factors related to technological infrastructure and use of technology in everyday life. Several factors are tied to the technological standardization (network standards, standardization, the technological situation). Other factors have to do with the quality and possibilities of technology (quality of presentation, simplicity, mobility). Two of the groups were also concerned with health-related consequences of mobile techonology, such as radiation risks. The driving forces identified by the workshop groups pertaining to technological situation are summarized in the table below (table 4.5).

Table 4.5: Driving forces: Technological development

	Information group	*Transaction group*	*Entertainment group*
Technological development	• Network standards. • Quality of presentation. • Health-related consequences of radiation. • Simplicity • Protection of privacy (positioning).	• Health-related consequences of radiation. • The technological situation. • Standardization (technological). • Mobility. • (Possibility of) value chain control. Customized devices.	

The fifth dimension is related to the social context in which mobile services are offered. We have labeled this dimension *social identity*, and it incorporates factors related to the value orientations of individuals, organizations and the overall culture, which may influence both the supply side and the demand side of mobile services. The driving forces identified by the workshop groups pertaining to social identity are summarized in the table below (table 4.6).

Table 4.6: Driving forces: Social identity

	Information group	*Transaction group*	*Entertainment group*
Social identity		• Time of maturity (adoption).	• Earlier youth – later grown-up. • More self realization. • More individualization/ the renaissance of niches. • Network effects and the reference group's use of technology. • Erasure of the distinction between work and leisure time. • Wish/demand of always being updated. • Porn/"hackney" and triviality, and more tabloid. • The trends are getting shorter and stronger. • The importance of brands.

The factors related to social identity were especially focused by the entertainment group. This may be explained by the fact that a majority of mobile services today are of a non-practical character, aiming at entertaining and killing/filling time, and targeted at youths or young adults. This is also supported by empirical research, which has shown that the motivation for adopting mobile services related to expressing social identity is important, and that there exist age differences regarding perceived expressiveness of mobile

services (younger people perceive services to be more expressive than older people) (Pedersen et al., 2003). The scenario participants thus seem to realize the importance of understanding the social situation of the users of mobile services.

In summary, in our attempt to reduce our data consisting of 36 important and uncertain driving forces in the mobile industry, we were able to group the factors into five common themes: value chain organization, government regulations, financial aspects, technological development, and social identity. However, we need to synthesize the data further as our basis for building scenarios is restricted to two key dimensions. While it is difficult to synthesize the five themes further, we can explore if some of the themes are more fundamental and perhaps linked to other themes

Although we recognize and understand the groups' focus on value chain organization and financial aspects, we do not pursue this line of reasoning in our scenario building. The reason for this is that we find organization of the value chain or value network and potential cost- and revenue models as consequences or results of other and more profound impellents. That is, actors have to make choices regarding supply side organization, revenue and cost sharing, etc. based on future business environments that come into being as a consequence of (mainly) non-controllable factors. Our two final dimensions need to capture these non-controllable factors.

In other words, compared to other dimensions that affect the development of specific mobile services and customer needs in the future, we believe that value chain organization and financial aspects to a lesser degree are able to influence the direction of development. In contrast, we believe that the dimension of government regulation is more of a driving force than a consequence of other driving forces. However, government relations are affected by social identity at

the political and economic level and can thereby be covered through the more fundamental force of social identity.

The two themes that, in our point of view, are more conspicuous than the others are technological development and social identity. The mobile industry is young but it has already gone through tremendous changes based on technological development. This is likely to continue and to be a main determinant for the future of the industry. Technological development is therefore clearly extremely important for future development. Uncertainty is mainly tied to the degree to which future technology means completely new technological infrastructure and devices, or developments within the same technological paradigm. In terms of social identity, this force incorporates many of the initial factors that were mentioned by the industry experts because it covers both the societal level and the individual level and hence includes values within the society (such as government regulations, possibilities of control of value chain) as well as individual needs and preferences (willingness to pay, adoption rate). We therefore believe that technological development and social identity are fundamental and important forces which determine the development of the mobile industry - however, the direction of this development is highly uncertain.

In the next section, we describe these two dimensions using existing theory. The objective is to point out the extreme points of the technological development and social identity scales. These descriptions will again be used as foundation for our scenarios.

5 DESCRIPTION OF DIMENSIONS

The two key dimensions, technological development and social identity, are central in developing the scenarios. It is therefore important to have a clear understanding of what the dimensions mean. In this section, we use theory to define the key dimensions and draw up the two alternatives within each dimension (the extreme point on the respective scales) that will constitute the basis of our prospective scenarios.

5.1 Technological development

In this section we describe the extreme points of the technological development dimension, which we name *technological convergence* and *technological divergence*. These extreme points can be summarized by the following antagonism: *Full interoperability*[1] *of devices* (convergence) versus *proprietary systems and technologies* (divergence). It should be mentioned that we will always have a situation of partial technological standardization (there will never exist only one technology in which all devices and services are based on), and that the concepts of divergence and convergence as used in the following discussion refer to "ideal types" aiming at clarifying the outermost values of the technological development continuum.

Following the concept definitions above, the existence of several technological standards in the market does not necessarily imply a situation characterized by technological divergence. In fact, there will always be several standards, and the decisive factor determining where on the divergence – converge continuum we are located, is the level of compatibility between the standards. That is, highly compatible technologies (or a "family" of standards) will have the same

[1] Interoperability refers to the ability of two or more systems to exchange information and to use the information that has been exchanged.

effects regarding the positioning on the continuum as one single technological standard.

The level of compatibility between existing standards determines whether or not technological development can be characterized as convergent or divergent. Consequently, the placement on the continuum will change over time. The speed and degree of these changes are difficult to predict. Anderson and Tushman (1997) and Tushman and Anderson (1990) describe alterations in technological standards as *long-term* evolutionary changes or modifications of existing technology that are *intermittently broken by revolutionary replacement* of the existing standards. This pattern of change has been found in many industries and for many products, and is agreed upon by a number of researchers from several academic disciplines (see Anderson & Tushman (1990) for a short review).

The *punctuated equilibrium model* (Tushman & Anderson, 1997; Anderson & Tushman, 1990) refers to this pattern of change in which long periods of routine evolution alternate with short bursts of rapid transformation. This cyclical developmental pattern means that industries go through long periods of incremental technological change, punctuated by occasional technological discontinuities. These discontinuities are major breakthroughs that push forward the state of the art in an industry's core technologies by an order of magnitude. Each discontinuity triggers an era of ferment, a period of rapid technological change in which different designs often clash as a new technology replaces the previous and established technology. This struggle between alternative technologies culminates in a dominant design that evolves into the standard architecture expressing the original, crude breakthrough idea (Tushman & Anderson, 1997).

A radical technological alteration triggers an era of ferment, which is characterized by both competition between technical regimes and competition within the new technical regime (Anderson & Tushman, 1990). The length of this divergent state is, according to Anderson and Tushman, contingent on the type of technological discontinuity. When a technology builds on a completely new knowledge base, many rival designs appear, and it will take longer to find an agreed upon standard than in situations where the technological alteration builds on know-how embodied in the technology that it replaces. Irrespective of discontinuity type, however, substitution does not immediately follow the appearance of a radical innovation, but the subsequent replacement of a new technology is rapid once the superiority of the technology has been established (Fisher & Pry, 1971).

Discontinuous and radical technological innovations do not merely advance the state of the art, but rather alter the rules of the game. According to Schumpeter (1942), innovations that "command a decisive cost or quality advantage and that strike not at the margins of the profits and the outputs of the existing firms, but at their foundations and their very lives" (p. 84), appear at rare and irregular intervals in every industry.

The broadband is an example of a fairly recent discontinuous technological innovation since it is based on a new technological platform which will replace previous technological infrastructure due to its superiority in terms of the amount of data that can be transmitted and the high speed with which transmission takes place. Although the technology has been available for some time, and there is no question of its superiority, we have not yet seen that it replaces old technology. There are several reasons for this. First, the new technology is expensive to offer to the mass market and established actors try to maintain their technological solutions for as long as possible. If established

actors are powerful and influential, then this struggle between alternative technologies can be long-lasting. In the short term, the old technology will not become obsolete, and the new and the old technology may even be compatible. The innovation is nevertheless considered as frame-breaking because in the long run the old technology will be completely replaced and worthless. Hence, rendering old technologies obsolete sometimes takes time.

During periods of technological convergence there will be technical improvements (innovations) as well, but these represent evolutionary rather than revolutionary technical advances, as they build on existing technological platform. This is what we now are facing with the new UMTS (Universal Mobile Telecommunications System) technology, which represents an evolution in terms of services and data speeds from today's "second generation" mobile networks (GSM). For operators of GSM networks, SMS has become a success, and now customers are also embracing Mobile Multimedia Messaging (MMS), an evolution of text messaging that adds pictures and sound elements. UMTS will build on these first steps towards a mobile multimedia future, allowing operators to offer exciting new services to consumers as well as business users. Most of the models in the first wave of UMTS terminal designs are multi-band and multi-mode, allowing users to switch seamlessly between UMTS, GPRS and GSM services in different frequency bands.

While the punctuated equilibrium model has been widely accepted as an important contribution in explaining change in organizations (particularly technological changes), one may question if the model needs to be modified based on changed circumstances. There is increasing evidence that radical technological changes occur ever more frequently, hence the stable period between discontinuous changes may have become dramatically shorter in the pasts ten to fifteen years. As we experience a rapid globalization of markets and

increasing dependence on ICT in many (most) industries (Ariño & Torre, 1998), changes in technological platforms are likely to occur at a faster speed than before. According to the founder and Chief Executive Officer of Forrester Research Inc., George Colony, a new "technology thunderstorm" occurs every *five to nine years* (Evers, 2003). Another critical issue has to do with the struggle among alternative designs. According to Glimstedt (2001), different technological standards no longer compete to the same extent. He argues that there is a sustained long-term trend towards open standards and convergence in information and communication technology.

We believe that the punctuated equilibrium model still holds for most industries. However, technological discontinuities are likely to occur more often which means that we will no longer have long, stable periods with well-established technological standards. In the next section we describe the two outermost values of the technological development dimension (convergent versus divergent industry standards), which we believe are equally plausible future situations within a time frame of five to seven years.

5.1.1 Convergent industry standards

By convergent technologization, we mean evolution towards industrial standards. In this situation, because of a common technological foundation for all actors in the industry, companies will emphasize efficiency more than effectiveness. That is, compatibility may enhance price competition among sellers, necessitating a focus on efficiency. Compared to the situation of divergent technologization, it is easier to deploy new products and services for the future when the technological foundation is fixed or predetermined. However, these new products and services may be *less* innovative than in a technologically divergent condition. This does not mean, however, that we will

have limited services differentiation in a convergent situation. Quite contrary, the services are likely to be highly specialized and personalized, but as they must be built on a common technological platform, the level of innovation that can be achieved is limited.

When the industry standards are converging, products and services that are introduced to the marked must adapt to already existing products and services in order to be compatible. As a consequence, technological convergence may be an impediment to innovation. Farrell and Saloner (1985) use the standard "QWERTY" typewriter keyboard (which is inferior to several alternatives) as an example of the retarding effects a well established standard has when it comes to introducing more effective and efficient products and services in a market where compatibility is important.

Technological convergence and device range

Technological standardization might be a determining factor for device range. Device range refers to the number of functions a single device supports. We believe that technological standardization can lead to limited device range as the interoperability accompanying a "universal" technological platform renders possible specialization of devices. When different devices are able to share and use information, it is likely that devices will be optimized for specific purposes.

5.1.2 Divergent industry standards

According to the punctuated equilibrium model, divergent technologization refers to the changes in the technological "unanimity" that have evolved in the previous stage (the stage of convergent technologization). In this situation, the business environment is characterized by incompatible infrastructures and devices. An example of this development may be the introduction of IP Telephony (Voice of IP - VoIP). VoIP is the transmission of telephone calls

over a data network like one of the many networks that make up the Internet. VoIP technology uses a technology (packet-switching) that provides several advantages over the concept that has been used by telephone networks for over 100 years (circuit switching). Another example, mentioned previously is broadband and the technological infrastructure behind broadband.

As the level of innovation in this phase is higher than it is in the convergent phase, it may be argued that companies have to focus on technological effectiveness (efficiency *and* adaptability to future circumstances) in order to succeed. Effective organizations balance immediate efficiency with the ability to deploy new products and services for the future. This latter aspect is more difficult in this situation than it is in a situation of converging technologization, because of a lack of a specific technological foundation that the products and services can be built and delivered on.

Technological divergence and device range

In a situation with different proprietary technological platforms, the devices will not be able to communicate with each other. The result will be an increase in the device range. In other words, a lack of interoperability might result in fewer devices. This state is thus contrary to the situation of technological standardization. When different devices are unable to share and use information, it is likely that devices will be designed with the intention of incorporating multiple functions.

5.2 Social identity

Social identity is the second dimension that we will use as basis for our prospective scenarios. Social identity can be understood as value orientations that individuals have that assist in the adaptation to their physical and social environment (McCarty & Shrum, 2001). In this section we outline the two

(opposing) alternatives within this dimension. The extreme points of the social identity scale are *individualism* and *collectivism*. These value orientations are of course affected by the values at the societal level.

There is no broad consensus on how to define *identity*, and there is a lack of consistency in the procedures used for determining the content and the scope of the concept (Abdelal et al., 2001). Authors distinguish between various *perspectives, levels of analysis* and *forms* of identity (Pedersen et al., 2003), and social identity is typically considered as one specific form of identity (Abdelal et al., 2001; Fearon, 2002). We do not intend to review the elaborate works of the various "schools" occupied with identity research, but rather describe the social identity concept that is fundamental to our scenarios. At the same time we acknowledge that there exists a proliferation of identity-based research which has resulted in several alternative understandings of the concept.

There are a number of different research perspectives on social identity:

- First, at the *individual level*, social identity affects persons' attitudes and actions (see e.g. Markus, 1977; Belk, 1988; Aaker, 1999). This perspective is interesting for researchers occupied with *consumer behavior,* for instance to assess whether social identity influences the demand for products and services.
- Second, social identity can also appear at the *organizational level* in terms of organizational identity and image, and organizational culture or values (see e.g. Hatch & Schultz, 2002; Robert & Wasti, 2002; Hogg & Terry, 2000). This perspective can contribute to our understanding of *organizational behavior*.

- Third, social identity at the *national or international level* is often associated with *culture*, which again affects consumer behavior, such as differences in terms of demand of products and services (see e.g. Li et al., 2000; Yaveroglu & Donthu, 2002).
- Fourth, social identity from an *economic/political perspective* is tied to ideology. This research stream focuses on the context in which organizations operate and individuals make choices (see e.g. Gummer, 2002; Herriot & Scott-Jackson, 2002).

Taken together, the four streams of research on identity provide us with insights in terms of how societal values affect values and behavior at the national, organizational, and individual level. From political, economical, and sociological perspectives, we gain an understanding of how social identity shapes (and is shaped by) society. Both *organizational* and *individual* behavior is affected by current ideologies and societal norms.

The literature on identity within organizations is predominantly occupied with how organizations perceive themselves (who are we?) and how relevant others perceive the organization. Within the past five years, organizations and organization research have focused on organizational values and how values and identity may act as guidelines for organizational behavior. This stream of research, although interesting, will not be included in our definition of social identity. We are mainly concerned with how identity affects organizational behavior in terms of how organizations within an industry will organize their activities (through market mechanisms, cooperation and so on) and how identity will affect consumer behavior.

At the national or societal level we can view social identity as built around either predominantly individualistic values or collectivistic values (Hoefstede,

1980). Either the individual or the group must be sacrificed when a conflict arises (Ryan & Rutherford, 2000).

In highly individualistic cultures or societies (such as the U.S.), the individual, individual freedom, and individual goals are valued above collective. Individualistic societies support the idea that humans should be left to pursue individual projects and the society and government should facilitate this without too much intervention. Individualistic values at the societal level affect consumer behavior, particularly needs and preferences.

In highly collectivistic cultures or societies, most behavior will be based on the collectivistic aspect of an individual's self. Naturally, this will have implications for individuals' adoption and use of specific products and services. In the mobile business, for example, it is argued that cultural differences (among other things) between how people want to access information in Japan and elsewhere is one factor explaining why iMode's success has not been replicated in the West (Baldi & Thaung, 2002; Mello, 2003).

However, Ryan & Rutherford argue that it is not a question of individualism or collectivism, but different combinations of the two. There are thus several interesting contributions that are highly critical towards a dichotomization of social identity. According to Triandis (1994), collectivism and individualism represent opposite ends of a continuum when studied at the cultural level (Triandis, 1994), but when studied at the individual level, however, research suggests that both individualism and collectivism can exist within the same culture and thus represent separate dimensions (Triandis & Gelfand, 1998; McCarty & Shrum, 2001).

In assessing individual preferences and behavior, identity at the individual level is of particular importance. The reason for this is that we are concerned with the

emergence of new products and services, and how consumers' preferences might influence various aspects of production and value network organization. However, social identity at the individual level is inherently tied to identity at the societal levels, and we therefore draw on research on both micro and macro levels in our scenario building.

In research on consumer behavior, social identity has been defined as "the actuated perspective or frame of reference that a consumer possesses as part of the repertoire of who they are or want to appear to be" (Reed, 2002, p. 255). In aiming to increase our understanding of how social identity might influence peoples preferences for specific products and services, the concept of "product symbolism" (Levy, 1959; Tucker, 1957) has been central. Basic to this concept is the belief that consumers have the capacity to define themselves through their purchase and consumption of products and services, and that the self-identification and status of people are tied up in the products and services they consume (Reed, 2002). Consumptions activities can thus be understood through self-definition (Kleine, Kleine and Kernan, 1993) as people use different product constellations to enact each of their role identities (e.g. tennis player, bird-watcher).

This is related to Pedersen & Nysveen (2003) and Pedersen et al.'s (2003) use of the concept of *self-expressiveness* in the mobile commerce context. These authors use self-expressiveness as a basis for explaining how adoption and consumption of products and services is a result of consumers' behavior aiming at constructing their social identities. They assert that "(…) expressiveness in terms of both the social expression of identity and self-identification are important elements in the adoption and use of mobile services" (Pedersen & Nysveen, 2003, p. 4).

Below we will outline the characteristics of the two end-points on the social identity continuum.

5.2.1 Individualism

The broad outline of individualism is the tendency to value the individual over the group and give priority to personal goals over group or collective goals (McCarty & Shrum, 2001). At the outermost individualistic point of the social identity continuum, the good of the individual is always in focus (Ryan & Rutherford, 2000). This includes individual initiative, a focus on the self, as well as self-reliance and freedom of choice (McCarty & Shrum, 2001; Hofstede, 1980; Bellah et al. 1985). Reason drives knowledge and is viewed as the source of all knowledge. Even emotions are programmed by rational processes (Ryan & Rutherford, 2000), and individuals are thus characterized by emotional independence (Hofstede, 1980).

Individual social identity is based in a view of humans as individuals who should be left free to pursue individual projects. Accordingly, individualism stresses freedom of choice and individual rights over duties (McCarty & Shrum, 2001). Proponents of this view include the free-market laissez-faire economists and libertarians, objectivists, and ethical individualists (Ryan & Rutherford, 2000; Waterman, 2002). Individualists also focus on immediate benefits relative to costs (McCarty & Shrum, 2001).

Consequences of individual social identity at the political and economic level include the lack of government intervention, strong personal property rights, and the reliance on competition for governing markets (Ryan & Rutherford, 2000). Individualism as a cultural dimension at a national level has been connected with greater innovation (Yaveroglu & Donthu, 2002).

In sum, the most salient features of individualism are 1) the fostering of independence and individual achievement; 2) the promotion of self-expression, individual thinking, and personal choice; and 3) focus on private property and individual ownership. All choices that persons make are in other words based on a desire for self-realization and the achievement of personal goals. This will be reflected in consumption of products and services, including the deliberate use of products and services as symbols for individuality.

5.2.2 Collectivism

In contrast to individualism, collectivism focuses on the goals of the group over personal goals. Group conformity and harmony are important elements in this orientation, and when social identity is tied to the good of the group, individuals define themselves in relation to the group (Triandis, 1995; McCarty & Shrum, 2001). This represents a situation where humans are viewed as inherently social.

Reason is not the only source of knowledge. For instance, emotion and intuition can not be explained by reason, but are beyond reason. Among the proponents for a collectivist view of social identity, we find communitarians, social contract theorists, and neoclassical orthodox (Ryan & Rutherford, 2000; Waterman, 2002). Collectivists focus on collective benefits and costs and are willing to wait for the benefits. Hence they seem to have a longer time perspective than individualists (McCarty & Shrum, 2001). People with a collectivist social identity have also been found more easy to influence that those with individualist social identity (McCarty & Shrum, 2001).

In sum, the most salient features of collectivism are 1) the fostering of interdependence and group success; 2) the promotion of adherence to norms, respect for authority, and group consensus; and 3) focus on shared property and

group ownership. Hence, choices that individuals make are influenced by group values, and respect and responsibility for the group, family or community. Self-worth and esteem are not defined only in terms of individual achievement, but also derive from the performance of group-conformant acts that create social links and bonds.

5.2.3 Trends in social identity evolution

We believe that social identity evolves slowly and that this dimension shows long-term trends. This means that we anticipate constant, though slow, movement between the endpoints over time. The Norwegian and Scandinavian countries are based on egalitarian and democratic values but in the past 60-70 years we have seen different trends in terms of social identity. In the post-war period focus was on growth, rebuilding the country and to a certain extent collectivistic values. This increased in the 1970's when a hippie movement, with its strong focus on soft values and collectivism, swept across the western hemisphere. For the last twenty to twenty-five years we have seen an increasing focus on social identity based on individualism in Scandinavia. People in individualistic societies (such as the U.S. and Western Europe) are becoming more and more focused on themselves at the expense of focusing on collective goals. While it is highly unlikely that we will move towards the far end of collectivism in the foreseeable future, there are certain trends that seem to indicate a counter-movement away from the individualistic focus. These trends serve to nuance the intensive focus on individuals. Examples include increased focus on organizational values, corporate social responsibilities, triple bottom lines, teamwork and team performance, ethics in business schools, and the movement called "no-brand". The no-brand movement is a direct response to the enormous focus on brands and brand equity. All of the above focus on setting collective goals and/or multiple goals which go beyond economic

performance. The idea is that individual goals (for companies for example) can only be reached, (or can better be reached) by securing collective goals.

In five to ten years time we may have moved either further towards individualism as the central factor for defining social identity, or we may see a counter-movement, where there are many more initiatives geared towards recognizing collective goals as well as individual goals. Collective goals are unlikely to replace individual goals within such a short time frame, but they may have gained more importance in guiding individuals' in their product and services preferences.

By combining these two opposite values of social identity with the two extreme points of the technological development dimension (divergence and convergence), we get four different plausible situations in which firms have to operate. In the next chapter we develop four scenarios and describe how the business model elements defined earlier might differ from situation to situation.

6 DESCRIPTION OF SCENARIOS

In this chapter we present four future scenarios of the mobile telecom industry by discussing how the dimensions of technological standards and social identity might influence business model elements. We use the business model framework to structure our presentation. The level of analysis is the mobile industry hence we will not be focusing on a specific firm or a specific product, but rather aim to describe the business model elements in a generic manner. That is, we call attention to characteristics of business model elements that are important for several (or all) actors in the mobile telecom industry.

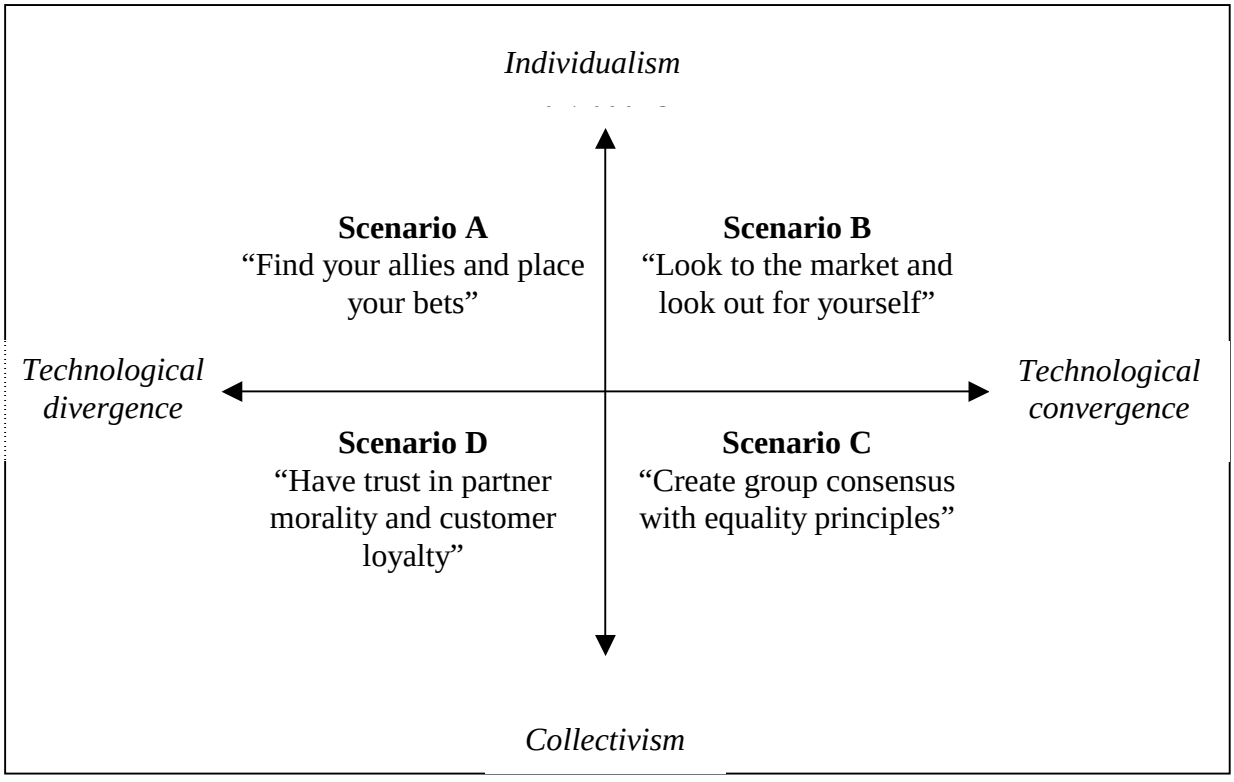

Figure 6.1: The four scenarios

6.1 Scenario A: Find your allies and place your bets

Fundamental to this scenario is that new and groundbreaking technology has recently been developed, which makes previous technological standards obsolete. Services based on the old technology are not compatible with services based on the new technology, and the supply side and the demand side of the mobile services market are both characterized by uncertainty regarding technological foundations. Some organizations and consumers are not convinced that the new technology will replace old technology, but the greatest uncertainty has to do with which of the new alternative solutions within the new technology will become the industry standard. Since development has been revolutionary rather than evolutionary, many different solutions and platforms coexist and there is currently a struggle to become the industry standard.

Uncertainty about technological solutions brings high risk for consumers in this individualistically oriented society. If an individual selects services within one technological platform, which few other individuals choose, the values of the service will be limited. This is particularly the case if the value of the service increases with the number of users, i.e. if there are network effects. Because of uncertainty regarding industry standard, network effects become extremely important both for customers and suppliers. Suppliers need a critical mass of customers in order to attract other customers. A critical mass can serve to reduce uncertainty and risk for consumers.

Individualistic values at both the individual and societal level have increased dramatically. Technological uncertainty will be left to the market to resolve as the government hesitates to interfere with business. Free competition between actors is the pre-eminent governance form, and there is wide agreement that this is the best way to achieve efficient and effective markets. However, strong personal property rights have become necessary since consumers, as well as

firms, look out for themselves and focus on individual achievements and on remaining independent.

6.1.1 Core value propositions

Individuals value services that enhance independence and self-realization. Mobile services serve self-expressive needs, meaning they signal and/or contribute in developing personal identities that are based on independence and self-realization. There are many early adopters, but the focus on conspicuous consumption (differentiating oneself through consumption) makes early adopters spread across many different services and it is difficult to obtain a critical mass. Suppliers are still preoccupied with killer applications. Because of the technological uncertainties and complexities, service development is supply driven, and this makes for more innovative and technologically advanced services.

Urbanization has increased and trends and fashions are shorter in duration and stronger in effect. In the search for fulfilling personal goals, many people are drawn to the cities, where there are more opportunities and choices than in rural areas. The pace of change has increased. In general, people move around more and have become more mobile - at least on a temporary basis. This contributes to more rapid diffusion of new trends. The number of single households has continued to rise. Services (and the user gratifications they aim at fulfilling) must be adapted to current trends, and services need to be continuously modified according to current user gratification needs that corresponds to the speed of change in trends and fashions.

Irrespective of the specific trends and fashions, the unique attributes of mobile services, such as accessibility and personalization, are highly valued among consumers. Due to the technological incompatibilities however, the potential

for accessibility is limited. Incompatible network standards may thus inhibit the offering of services that focus on the mobility of users. This may represent a major challenge for businesses as consumers with individualistic social identities value the opportunity to be mobile, as mentioned above.

Personalized services are more common, but here too, technological incompatibilities hamper development. However, consumers' preferences are mainly based on what previous technologies could deliver. Few consumers understand the potential and the possibilities brought about by the new technology. The market is therefore immature and technology limits the scope within the mobile industry. Services are likely to meet "established needs" through new channels (or based on new technology). For new and innovative services, which may have additional unique attributes, the market will have to be educated.

In an immature market with high technological uncertainty, most firms will be focusing on an undifferentiated market. Early adopters are often willing to put more effort both into getting a hold of new services and being able to use new services. They are also often willing to pay more. Early adopters generally have other preferences and needs compared with the market in general. In order to build a critical mass, and to make sure that one's own technology does not lose out in the battle of the standards, an undifferentiated market focus is crucial for firms operating in a technologically divergent and individualistically oriented market. There is a dilemma here because if services are targeted for early adopters and the latest trends and fashions (in order to trigger a critical mass), then there is the risk that less convinced and less dedicated consumers (the market in general) will either chose other more user-friendly and available alternatives, or refrain from choosing for as long as possible.

6.1.2 Value network

There are many new actors in the mobile business as the firms that first introduce new and groundbreaking technology probably are relatively small newcomers. Established actors, with an influential position in a convergent market (prior to the divergent phase), will usually be best off by keeping the "status quo", or alternatively introducing only minor technological innovations that do not render their existing technology obsolete.

Thus, we find that a large number of firms offer mobile services in a highly competitive market. Because there is no technological standard, it is difficult to know which firms will have influence in the market over time. Established actors are likely to try to retain their influence for as long as possible in order to milk the market based on the old technology. In times of uncertainty, the intuitive strategy will be to maintain flexibility e.g. by betting on several different technologies. In situations with new technological standards it is often not possible to maintain flexibility because the technologies are advanced and non-compatible.

Another way to reduce uncertainty, although without maintaining the same flexibility, is to form clusters of businesses that compete against each other in order to gain influential positions in the market. This implies strong network ties within the clusters. Tight cooperation, both vertically and horizontally, is important to reduce risk in choice of technological standard and to gain market influence in the next stance. Tight vertical cooperation or vertical integration is therefore likely as firms must choose which technology to "put their money on". Companies will focus on vertical relations, but as the value chain/network of the core product becomes well-functioning, they will increasingly emphasize horizontal alliances. Therefore, in a situation of divergent technological development we will see few but tight horizontal alliances that contribute in

developing complementary services. This can increase the likelihood of getting a critical mass of consumers. Once a standard has evolved and the market becomes more mature, the consumers will also demand more complementary services.

Another factor which supports alliance building is the fact that service development in technologically uncertain environments tends to be supply driven. Because consumers have limited knowledge about the new technologies and new services, product bundling will take place at the supply side, and this may require alliances.

6.1.3 Financial aspects

When new technologies are developed, high development costs will always affect the initial cost structure. In addition, firms are likely to do whatever they can to gain a critical mass of consumers, and this includes selling low-priced services, even at a price where they lose money. This is because the firms and the technology that successfully acquires critical mass, will make other firms and competing technologies practically worthless. The quest for a critical mass of consumers will generate low revenues. The main question in this situation is how to share the costs within the value network. In an individualistically oriented society, we expect that all firms will be focusing on the best solution for them personally, rather than the best solution for the customer or the whole network.

Table 6.1: Summary of business model elements – scenario A.

Business Model Dimension	**Likely choice in scenario A**
Core value proposition	
1) Uniqueness	1) Limited uniqueness
2) Scope	2) Limited scope
3) Degree of service innovation	3) Service innovation
4) Market focus	4) Undifferentiated focus
Value network	
1) Actors	1) Many new entrants, small firms
2) Influence	2) No inherent network influence.
3) Network ties	3) Tight network ties.
Financial aspects	
1) Revenue model	1) Low revenues.
2) Cost model	2) High cost structure.

The table above summarizes the key business model elements in Scenario A. We have labeled the scenario "Find your allies and place your bets" because we believe that the divergent technological situation will demand close cooperation between firms in the network as they have to bet on future technological standards. The technological uncertainty also affects consumer choices and available mobile devices. While many truly innovative services are possible and perhaps available, consumers are generally hesitant to place their bets as some of the technological solutions are likely to become worthless over time.

6.2 Scenario B: Look to the market and look out for yourself

In this situation, mobile technologies have advanced, but innovations the last five to seven years have been adjustments and improvements within the existing technological paradigm rather than revolutionary technological changes. Mobile services are based on complete interoperability and compatibility, not only at the national level but also at the global level.

The individualistic orientation of society has increased. The efforts toward greater care for society and the collective good, such as through triple bottom lines, corporate social responsibility, and anti-capitalist movements were just a fad of the late 90's and early 2000. The fad was replaced by a Norwegian society that moved beyond the U.S in terms of individualistic orientation. The reforms within health-care, higher education and universities, and the public sector have lead to increased reliance on market mechanisms in many situations. Most organizations and public institutions are exposed to both national and international competition. "Customers" purchase services from hospitals and the public offices. Most people have become professional consumers with highly sophisticated needs and requirements. This is also true for the mobile service sector.

As mentioned in scenario A, people are more mobile and the pace of change has increased. Urbanization has continued, but due to the possibilities with mobile technologies, many people also lead more flexible lifestyles, working from different locations at different points in time. Work and leisure time has blurred and technological convergence makes it easy to work from your sailboat or mountain cottage at whatever time is convenient for you.

6.2.1 Core value proposition

Consumers have many and widely varying preferences and needs, and service development is demand-driven. Consumers prefer services which re-enforce independence and self-realization. Since the same technology is widely used, there is a threat of potential misuse of information about consumer preferences and needs. Individuals therefore need protection of privacy and rights.

Mobile services will rely heavily on its' unique attributes, such as accessibility and personalization. Consumers have become used to the technology and

request more and more advanced services. Because all services are compatible with other services, the consumer can customize his/her own specialized packet of services based on complementary services. The customers bundle their products themselves using market mechanisms. The service scope will thereby be broad. Mobility, customized devices, and services diversification are crucial for creating customer values in a technologically convergent and individualistic society.

Based on the mature technological market, mobile service providers are likely to focus on niches in the market. However, since the technology is employed on a global basis, a niche can be quite large if the aim is a niche at the global level.

6.2.2 Value network

The value network consists of many specialized actors and a few large actors who have gained influence by betting on the winning technology. Value creation is driven by market forces. Products with high customer value are likely to consist of several specialized components, hence it remains difficult for individual actors (organizations) to achieve control over the value chain or value network. The final product may also be composed by the consumers themselves. We will see an increasing trend towards prosumption where the consumer takes an active part in the production process (production + consumption). This necessitates a flexible organization where the value network and network actors have high adaptive capacity.

The government rarely intervenes in business, except for regulating protection of privacy, and for securing fair competition. In-depth knowledge about the customers represents the most important source of influence in the network. It therefore becomes important to have direct contact with the customers. Although specialized services require substantial cooperation, ties between the

other network actors are likely to be weak. Actors in the network rely on market mechanisms. This is possible when technology is convergent.

6.2.3 Financial aspects

The costs in this type of context are associated with innovation and customization. Development costs are low since there is no overarching technological uncertainty, but the market requires constant innovations and improved services. This limits the possibilities of acquiring economies of scale.

Contrary to the divergent situation, where initial investment capital was crucial but scarce, financial backing in a convergent situation will be much easier to obtain since technological convergence secures a shorter pay back time.

Table 6.2: Summary of business model elements – scenario B.

Business Model Dimension	**Likely choice in scenario B**
Core value proposition	
1) Uniqueness	1) Accessibility & Personalization
2) Scope	2) Broad scope
3) Degree of service innovation	3) Service improvements
4) Market focus	4) Niche focus
Value network	
1) Actors	1) Many specialized actors
2) Influence	2) Influence if close to customer
3) Network ties	3) Weak ties
Financial aspects	
1) Revenue model	1) Potential for higher revenues. Revenues shared through market mechanisms.
2) Cost model	2) Potential for low costs. Depends on how much each firm focuses on innovative services (R&D) versus imitation.

The table above summarizes the key business model elements in Scenario B. We have labeled the scenario “Look to the market and look out for yourself” because we believe that the convergent technological situation will open up for a vast number of different products and services based on the same technological platform and this allows actors to rely on market mechanisms. However, because of the compatibility and interoperability, each individual and each organization has to look out for himself/herself. Compatible technologies and services can easily be misused.

6.3 Scenario C: Create group consensus with equality principles

There have been many minor adjustments and improvements of the technology in the mobile business, but the changes have occurred within the existing technological paradigm. The changes have in other words not altered the technological standard, and there is therefore full technological interoperability and compatibility between products and services. For this reason we will have many specialized devices.

There is no uncertainty regarding fundamental technological solutions, and many services can be coupled or bundled. However, the technological knowledge is not the same in all companies, and development of specialized technological solutions is very important. Customization of devices, along with diversification and differentiation of services, will be essential. It is difficult to differentiate services based on technology as the fundamental technology is common and easily accessible. Unique technological knowledge will therefore be fundamental for companies. Differentiation of products and services is very important, and a global technological standard renders possible a large target group in spite of highly differentiated services.

Technological convergence may necessitate a stronger focus on protection of privacy issues. The ability of technological solutions and applications to share and use the same information can be a threat to the protection of both personal privacy and classified company information. The values of the consumers are highly collectivistic, and the government will actively regulate the market in order to achieve collective benefits. In fact, regulation of information flow may result in a lower degree of "actual" interoperability than what is technologically possible.

Because of the collectivistic values, adoption and consumption of products and services are not solely based on individual preferences. The consumers will appreciate interdependence and group success and they will conform to group norms and value group consensus. Consumers experience switching costs based on loyalty towards suppliers and loyalty to group.

6.3.1 Core Value propositions

The unique attributes of the technology are emphasized. Technological convergence leads to a more mature market and service development is demand driven. In mature markets, demand is generally sophisticated and segmented. Both personalization and accessibility of services are technologically possible but they are unlikely in this scenario due to the collectivist orientation. Services that make it possible to establish and maintain social relations are important. Accessibility will therefore be crucial, but personalization will not be that important (although adaptation of services on a group level will be demanded). Consumers want to demonstrate their contributions to the community, this does not imply that the desire to signify in-group and out-group belonging is completely lacking however.

The scope of the service offerings is rather broad, and suppliers are likely to focus on an undifferentiated market. This is not due to the technology, which renders possible niche focus, but rather due to demand characteristics. We will also see actors that produce and deliver specialized services to small focus groups.

6.3.2 Value network

There are many established actors that are involved in long lasting relations with others, and this will make it rather difficult for new entrants. However, newcomers with specialized knowledge on the unique attributes of the technology will be able to create niche markets by delivering differentiated products.

As consumers are more loyal than in an individualistic society, the established actors in the market will be most influential. This argument is also strengthened as inter-firm relations will have longer time perspectives and rely on trust-based governance mechanisms to a greater degree than in individualistic environments. However, technological convergence weighs heavily for market-based governance forms and consumers can bundle their own products using market mechanisms. Several businesses are involved in producing and delivering services that can be widely dispersed, market mechanisms must therefore to some extent be used. This makes it rather hard to control the value network. Network ties among a limited number of actors will be strong and characterized by social governance mechanisms, but market mechanisms will also be important as there are numerous inter-firm relations in the value networks.

6.3.3 Financial aspects

There is consensus regarding what technological foundation to build the services on. The development costs will therefore be low to moderate (compared to a situation characterized by technological divergence). Financial support from investors can easily be obtained. Further, because of the high potential for economies of information (scale advantages, network externalities), the costs will be relatively low.

The focus on an undifferentiated market, along with before mentioned information economies, also influences the potential for revenues positively. In a collectivist society it is unlikely that market mechanisms guide revenue sharing. Instead, principles based on equality are more likely to be used as a basis for sharing revenues among network actors.

Table 6.3: Summary of business model elements – scenario C.

Business Model Dimension	**Likely Choice in Scenario C**
Core Value Proposition 1) Uniqueness 2) Scope 3) Degree of service innovation 4) Market focus	1) Focus on uniqueness 2) Broad Scope 3) Service improvements 4) Undifferentiated market
Value Network 1) Actors 2) Influence 3) Network ties	1) Mostly established actors 2) Established actors are most influential 3) Strong network ties.
Financial Aspects 1) Revenue model 2) Cost model	1) High revenue potential. Revenue sharing based on equality principles. 2) Low development costs

The table above summarizes the key business model elements in Scenario C. We have labeled the scenario "Create group consensus with equality principles" because we believe that collectivist values will contribute to higher consumer loyalty and long-term investments in the industry. Long-term relationships tend to foster cooperation between the different actors. The technological situation opens up for a vast number of different products and services, but in this type of society, services must not only satisfy individual goals and needs but should increasingly cover the collective good, such as larger groups, the local community, the coffee bean pickers in Brazil and so on. Equality principles thus not only apply to the value network of actors, but also to consumer preferences.

6.4 Scenario D: Have trust in partner morality and customer loyalty

Similar to scenario A, new and groundbreaking technology has been developed and introduced to the market. This technology is not based on the foregoing technological paradigm, with the consequence of making the old technology superfluous or outdated. Innovative new services flourish, but they are based on several different technological solutions or platforms. Since the development of these technologies has not been evolutionary, the compatibility between different technological standards will be low or non-existing.

As the values of the consumers are highly collectivistic, adoption and consumption of products and services are not solely based on individual preferences. Adoption and use of services depends on interdependence, group consensus, and group success and consumers will often conform to group norms. Consumers are more loyal in collectivist societies. They perceive the switching costs between suppliers as higher than in individualistic societies and

new actors will find higher entry barriers in the industry based on consumer loyalty.

In a situation characterized by highly collectivistic values, the governments will be active in their endeavours toward collective benefits. As we have a struggle between different technologies to become industry standard, government intervention may influence (or even control) the selection of a technological standard, and thereby also the wide adoption of a specific technology that is necessary for this technology to reach a critical mass. The technological divergence is likely to trigger government intervention which may contribute to shorten the divergent situation.

6.4.1 Core Value Propositions

In this situation, there will be a struggle between the new and the old technological platforms. Suppliers drive service *development*, which leads us to expect greater service innovation than in scenarios with technological convergence. However, the degree of uniqueness of the new services that are *adopted* will not be necessarily be great. This is partly because the market for the services that are based on the new technology is "immature" and has to be refined in order to take full advantage of the technological innovations. Another reason is that the mobile services are likely to be used for fulfilling already existing needs and demands. Thus, the demand for services with unique attributes is low. There will be a demand for accessibility of the services, but because of the low interoperability of the technological platforms, the accessibility will also be rather low. Similarly, the technological situation will also affect the scope of the products that are offered. The technological situation is uncertain, and there has not been an evolutionary development of products based on a single technological platform which is necessary for the

product scope to be large. Further, the technological situation also influences the market focus of the involved actors. The competition may not be directed towards acquiring a critical mass, but rather at influencing government regulations and decisions. In the long run however, actors are likely to focus on the undifferentiated market.

6.4.2 Value network

Established companies are not likely to introduce technological platforms that make their existing technologies superfluous. Therefore the introduction of disruptive technological innovations in the market must be taken care of by new actors. Thus, there will be many new actors in the industry. However, strong customer loyalty can result in the coexistence of both new and old technologies in the market for some time.

Because of the existing technological uncertainty, there are no conspicuously influential actors in the market. The race for establishing technological standards is also a race for attaining network influence. However, both technological divergence and the focus on collectivistic values indicate a situation characterized by strong network ties. Actors in the industry are, compared to an individualistic society, more focused on long-term relations. Establishing strong ties, both to other actors in the network and to the government, is essential in order to get an influential position in the network (and thereby also establish a technological standard). In this respect, we believe that vertical alliances are crucial for establishing technological platforms. As described in scenario A, there may be constellations of businesses that compete against each other, and well functioning vertical cooperation is important in order for the constellations to produce and deliver inclusive services. In this respect, horizontal alliances will also be important, but because of the

collectivistic orientation of the consumers, the demand for complementary products will not be as high as it is in scenario A. Bundling of products and services will be done by suppliers, and this also strengthens the importance of alliances.

6.4.3 Financial aspects

The cost structure in this situation is relatively similar to the situation is scenario A. That is, we will have high developmental costs as the technologies have to be developed from scratch. Financial investors will view the market as high risk with a relatively long payback time until and unless the government signals which technology will be dominant. The government may also regulate how revenues in the industry are shared. Alternatively, an equality based revenue sharing model will be most likely in a collectivist society.

Table 6.4: Summary of business model elements – scenario D.

Business Model Dimension	**Likely Choice in Scenario D**
Core Value Proposition	
1) Uniqueness	1) Limited Uniqueness
2) Scope	2) Limited Scope
3) Degree of service innovation	3) Service innovation
4) Market focus	4) Undifferentiated market
Value Network	
1) Actors	1) Many new actors
2) Influence	2) Not any highly influential actors
3) Network ties	3) Strong network ties between a limited number of actors.
Financial Aspects	
1) Revenue model	1) Government regulated or equality principles
2) Cost model	2) Relatively high development costs

The table above summarizes the key business model elements in Scenario D. We have labeled the scenario “Have trust in partner morality and customer loyalty” because we believe that the divergent technological situation coupled with a collectivist society means that organizations have to keep good relations with the government as well as with consumers. Regulations are likely to settle the battle of technological standards and governments do not always settle on the best technological solution. Consumer focus will, as always, also be important.

The table below illustrates the differences in business model for the four different scenarios. In the next chapter we will focus on the strategic challenges in each of the scenarios, which competencies will create competitive advantages in the different scenarios, and how mobile service suppliers should position themselves today to be prepared for any of these future scenarios.

Table 6.5: Business model differences

Business Model Dimension	**Likely choice in scenario A**	**Likely choice in scenario B**	**Likely Choice in Scenario C**	**Likely Choice in Scenario D**
Core Value Proposition 1) Uniqueness 2) Scope 3) Service innovation 4) Market focus	1) Limited uniqueness 2) Limited scope 3) Innovation 4) Undifferentiated market focus	1) Accessibility & personalization 2) Broad scope 3) Improvement 4) Niche focus	1) Focus on uniqueness 2) Broad Scope 3) Improvement 4) Undifferentiated market focus	1) Limited Uniqueness 2) Limited Scope 3) Innovation 4) Undifferentiated market focus
Value Network 1) Actors 2) Influence 3) Network ties	1) Many new entrants, small firms 2) No inherent network influence. 3) Tight network ties.	1) Many specialized actors 2) Influence if close to customer 3) Weak ties	1) Mostly established actors 2) Established actors are most influential 3) Strong network ties.	1) Many new actors 2) Not any highly influential actors 3) Strong network ties between a limited number of actors.
Financial Aspects 1) Revenue model	1) Low revenues.	1) Potential for higher revenues. Revenues shared through market mechanisms.	1) High revenue potential. Revenue sharing based on equality principles.	1) Government regulated or equality principles
2) Cost model	2) High cost structure.	2) Potential for low costs. Depends on how much each firm focuses on innovative services (R&D) versus imitation.	2) Low development costs	2) Relatively high development costs

7 PRACTICAL IMPLICATIONS

Firms involved in mobile commerce will face different strategic challenges depending on the future situation that have, among other things, resulted from technological development and the evolution of social identity. We believe that for the first determining factor (technological development), the most important strategic challenge that firms must consider relates to interorganizational cooperation. For the second factor (social identity), the key word is customer values. In this chapter we present the most important managerial implications of our scenarios, with a particular focus on interfirm cooperation and customer values.

7.1 Interfirm cooperation and customer focus

In scenarios A and D, the technological uncertainty is high, and firms must appraise the different technological alternatives with reference to customer values. This means they have to evaluate whether or not a given technology can contribute in obtaining a critical mass of consumers and become the market standard. In situations of technological uncertainty, firms will try to be as flexible as possible when it comes to adapting to the various technologies available in the market. This may be difficult, and sometimes impossible, as the interoperability between the technologies is low. Irreversible investments in a single proprietary technological solution should nevertheless be avoided as long as possible, and the final decision of which technology to go for must be based on evaluations of both current and prospective customer values of the different alternatives.

Suppliers of mobile services must evaluate how other actors in the market may contribute in developing or delivering customer values. The abilities of different *clusters* of actors, particularly in terms of the salient competences

such as technological knowledge and customer knowledge, must be emphasized. This “cluster perspective” of knowledge resources is particularly important in a situation with low interoperability of technological solutions. The reason for this is that low interoperability forces a selection of one particular technology, and increases the irreversible investments firms have to make. The customer values that one particular cluster is able to deliver, will thus be important for the success of all firms involved in the cluster.

A customer centric perspective, and a focus on the resources needed in order to fulfil customer needs, is also important in a technological convergent situation (scenarios B and C), but then at the individual (firm-specific) level. In this case firms do not have to make any choices between a number of proprietary and incompatible technologies, and are thus more independent. Since a standard technological solution governs, it is easier to buy technological competencies in the market.

Customer values are likely to differ depending on the main orientation of the society (individualistic or collectivistic). Consumers in both types of societies seem to use consumer goods, such as mobile devices, to signal group belonging. Hence the role these types of services has in showing similarity to certain groups and distinction from other groups should be kept in mind in all four scenarios. We sometimes think that in individualistic societies consumers are only concerned with signalling distinction and in collectivist societies consumers are not concerned with in-groups and out-groups, but are all-inclusive. Research on social identity and culture indicates that individuals often attempt to both show belonging and distinction at the same time. However, the value propositions that lie behind mobile services will differ in the two types of social identity orientations. In collectivist societies organizations will be expected to play a much larger role in the society. We can

see this today in terms of the pressure on global firms to take social responsibility (Corporate Social Responsibility) and to show local responsiveness and involvement.

7.2 Service complementarities

Another element related to customer values that must be highlighted is the important role of service complementarities. Because of the nature of electronic business conduct, there will be potential for indirect and/or direct network externalities in all scenarios. How to realize this potential is an important challenge that firms must consider. In a situation of technological convergence, customers will do most of the work themselves as they will be free to select services (or service components) in the market. In contrast, in technological divergent situations, the "composer-role" devolves on the business actors as interfirm agreements are needed in order to create compatible and complementary services. Furthermore, a focus on two-sided markets is crucial in situations where indirect network externalities are important, and where the potential for customer value augmentation by use of service complementarities is present. Firms must in other words emphasize both customer values (end-user market), and at the same time strive for achieving mutual benefits for the actors involved at the supply side (value for the suppliers). This two sided focus may be necessary in order to start a positive circle where the customers perceive the complementary services on the technological platform to be attractive and valuable, and where the firms offering the services attract more and more customers.

7.3 Need for flexibility and lock-in strategies

In general, the future will be characterized by more frequent divergent periods. This will particularly affect highly technologically business markets such as the

mobile industry. Overall uncertainty regarding technological foundations will increase, regardless of the current technological standards (or lack of standards). Such a development necessitates rather flexible organizational structures. Firms that are able to adapt rapidly to market changes will have an advantage. However, as product innovations will be introduced to the market at more frequent cycles than before, firms must also seek lock-in mechanisms of both end-consumers and also of business partners in the value network. Obviously, this is a paradox. Firms must both focus on flexibility and be able to alter their business models based on market information, while at the same time many network partners will implement lock-in strategies in order to gain market shares. This is a strategic challenge that firms in the mobile commerce business must call attention to.

It is natural that incumbents and large companies with influential positions try to maintain their position in the network. They will seek to maintain status quo (e.g. Broadband versus ADSL from Telenor) when it comes to market positions and services innovations. The reluctancy of incumbents is not only based on the desire to milk the market for as long as possible, but exploring new opportunities and introducing innovations may also cannibalize or render obsolete their own existing products (or infrastructure as in the example above). This strategy may be an ill turn when the cycles of convergent and divergent technological situations become shorter. The level of innovation in divergent technological periods is high, and as we will experience such discontinuous changes more frequently in the future, the overall rate of innovation in the mobile business market (and other technologically intensive markets) will increase. Companies that rely solely on existing products and services in this environment, without focusing on proactive change and “leapfrogging” (i.e. rapid dissemination and assimilation of advanced technologies), are more or less certain to be scooped by the competition.

As a consequence, the role of R&D for the survival of incumbents (and others) will increase in importance along with the decreasing periods of stability regarding technological foundations on which mobile services are based. This particular (turbulent) situation also implies that use of scenario methodology must be given a more central role in strategic "planning" as the level of uncertainty rises.

7.4 Practical implications: Conclusion

The most obvious managerial implication from our scenario building, is the invariable need for a focus on market knowledge and customer orientation. Regardless of whether we have a convergent or divergent technological situation, and whether we have a collectivistic or individualistic value orientation, firms must develop customer centric perspectives alongside their technological competence and thereby gain knowledge of what the customers want. Knowledge of consumers is one of the most important resources a firm can possess; firms that are able to recognize customer needs and preferences (or even create needs and demands), and also act upon this information by introducing products and services, will achieve a competitive advantage.

7.5 Future research

This report has focused on future scenarios within the mobile industry with emphasis on business model dimensions. Thinking about and preparing for future strategic challenges can certainly be of value in and of itself. Future research should, however, link future business models to end-user adoption and thereby attempt to predict the level and rate of adoption in the different scenarios. Pedersen and Methlie (2004) have explored the relationship between business models and end-user adoption in mobile data services. They focus on performance of strategic choices along three dimensions that are highly related

to the three properties we use in our definition of a business model. Future research should continue in this vain and couple supply side research and demand side research.

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