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EXAMENSARBETE

Future Mobile Data Services for Tourism

Barriers and Enablers for Adoption of a Mobile Tourist Guide in the Tourism Industry of Norrbotten

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MASTER OF SCIENCE PROGRAMME

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Abstract

We are currently experiencing a paradigm shift in mobile telecommunication technology as the third generation (3G) of mobile telecommunication networks are being rolled out and mobile phones and other portable devices are becoming more advanced. Due to this technological evolution, it is in many actors' interest to identify future attractive mobile data services and to investigate how future business models can be designed. One industry that is expected to benefit from the introduction of 3G technology is the tourism industry, and one region that is believed to significantly rely on tourism in the future is Norrbotten. The initial research area for this thesis was therefore stated as: *How can the introduction of new mobile data technology enhance the value creation process of actors in the tourism industry in Norrbotten.*

Drawing inspiration from current mobile data applications within this field, a mobile tourist guide was selected as an appropriate service to evaluate. The mobile content value map, which highlights seven interrelated enabling roles that must be adopted by actors, in order to deliver content to mobile devices, was also used as a theoretical foundation. The value map can basically be seen as the integration of the value maps from two separate industries - those of the mobile voice and the media/content industries.

Against this background, the research problem was stated as: *How can the content value map for a mobile tourist guide in Norrbotten be characterised?* In order to approach this problem, two supporting research questions were formulated as: *How can the structure of the tourism industry in Norrbotten in the context of a mobile tourist guide be described?*, and *how can enablers and barriers for adopting roles in a future value map for a mobile tourist guide in Norrbotten be characterised?*

Snowball sampling was used to delineate the structure of the tourism industry in Norrbotten and also to identify actors whose opinions would be valuable to gauge. Eight interviews were conducted in total. The results of the interviews indicated that none of the tourism organisations had a prospective attitude towards introducing new technology, but that many saw themselves as fast followers once an innovation had proved itself elsewhere. Cost reductions and effectiveness in information gathering were identified as factors that would encourage adoption, whereas lack of financial means, start-up costs, employee time to maintain a mobile tourist guide, and organisational readiness were identified as factors that would impede adoption.

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Acknowledgements

This report is a Master thesis project carried out at the Department of Business Administration and Social Science at Luleå University of Technology in Luleå, Sweden. It has been produced for the Centre of Distance-spanning Technology at Luleå University of Technology.

Working with this project has been both challenging and rewarding and I have thoroughly enjoyed the task. The work has also been very instructive, enabling me to learn a great deal about the tourism industry and mobile data technology in general, but also about opportunities for future mobile applications and services opening up in this industry, as well as some of the difficulties and problems that need to be resolved before such technology can be introduced successfully.

I would like to thank all the people who have helped me and contributed to this work. First of all I would like to express gratitude to my supervisors, Lars-Ole Forsberg and Lennart Persson at the division of Industrial Marketing and e-Commerce at Luleå University of Technology, and Mats Eriksson at the Centre of Distance-spanning Technology. They have continuously contributed with valuable insight, experience, ideas and guidance. Furthermore, many thanks to Marika Stålnacke at Ericsson's Research Unit in Luleå for her support and advice. Finally, I would like to thank all the people who have been kind enough to take part in the interviews. Without them it would not have been possible to conduct this research.

Luleå, June 2004

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Mats Pääjärvi

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´We don't receive wisdom; we must discover it for ourselves after a journey that no one can take us or spare us.'

- Marcel Proust

Chapter 1 - Introduction

In the 1870s the two inventors Elisha Gray and Alexander Graham Bell both independently designed devices that could transmit speech electrically (the telephone). Both men rushed their respective designs to the patent office within hours of each other. The first one to patent his telephone was Alexander Graham Bell. There followed a famous legal battle between the two over who was the rightful inventor of the telephone, a process that would claim Bell as the victor. Approximately 60 years after Bell and Gray's race the concept of cellular phones began, when researchers looked at crude mobile (car) phones and realized that by using small cells (range of service area) with frequency reuse they could increase the traffic capacity of mobile phones substantially. However at that time, the technology to do so was nonexistent. In both Sweden and the US, it would take until the early 80s before commercial cell phone systems, that could handle a large user base, was taken into operation.

Since then, the wheels of technological development within this area have revolved faster and faster. In the middle of the 80s, the few mobile phones that could be seen where the ones hanging on the shoulders of financiers and stock brokers, announcing the important status of the carrier. At this time it was hard to imagine that 10 years later mobile phones would be practically given away for free to teenagers and young parents at shopping malls. Around the decade shift 1989/90 a TV-commercial was made by a mobile phone company showing an ironic futuristic fantasy of the millennium shift that was to come ten years later: new years eve 1999, champagne corks flying in the air, the sound of the clock on the mark of midnight – and suddenly, all the party people's pockets and purses start ringing. In the future, every one has their own pocket phone. This is what eventually was to happen, even a few years earlier, but at the time of the commercial it still seemed like science fiction.

Now we are witnessing the next step in the evolution of mobile communication. In many countries around the world third-generation (3G) mobile communication platforms are currently being rolled out. These platforms offer a higher bandwidth than the ones currently in operation, i.e. allowing higher transfer speed of data to be sent and received by mobile devices. From the perspective of the user, this is the obvious advantage of 3G over 2G and 2,5G. Equipment manufacturers claim 3G is up to 40 times faster than the earlier 2G general service mobile (GSM) technology and proponents speak of it as equivalent to upgrading from a bicycle to a racing car (Robins, 2003). The higher bandwidth enables users to send and receive digital photographs, moving video images, high-quality sound, and other advanced services, for instance those that are based on the location of the user (PTS, 2003). Much of this is already possible on 2,5G standards; however, 3G is expected to further enhance the

user experience. Another capability, resulting from the higher bandwidth of 3G, which is expected to prove appealing to the users, is mobile access to the Internet. Although the mobile Internet has been available on 2G and 2,5G standards for a number of years it has not yet had a breakthrough primarily due to usability issues. The introduction of 3G technology alongside more powerful mobile devices is expected to boost up its user numbers and make it thrive.

1.1 Background

The mobile telephony industry has experienced enormous growth in recent years as new users have embraced mobile technology. The bulk of revenue has come from regular voice traffic based on airtime. Market deregulation in combination with increasing competition has forced price erosion on voiced-based services, thereby posing a fundamental threat to operator profitability (Jonason & Eliasson, 2001). With falling profit margins in the mature mobile voice markets of Asia, Europe, and North America, mobile network operators are under increasing pressure to turn to mobile data services and m-commerce for additional sources of revenue. M-commerce is by Sadeh (2002) defined as: “any transaction with a monetary value that is conducted via a mobile telecommunications network”. Considering the technical convergence going on between the Internet, the wireless and the media industries, content and m-commerce services appear to be additions that could raise revenue and thereby safeguard the future profitability of wireless operators and lessen the dependence on voice as a source of revenue (Jonason & Eliasson, 2001).

Adding to operators financial burden are also the heavy investments that have been made in acquiring 3G licences and the necessary 3G, or UMTS (Universal Mobile Telecommunication System), infrastructure. As a consequence of being put under financial pressure, operators are eagerly searching for indications that witness of a future return on investment. However, the development of mobile data services able to raise ARPU (Average Return Per User) is not only a concern for operators, but of primary interest for all actors in the telecom industry, i.e. operators, infrastructure suppliers, device manufacturers as well as service providers. Consequently, many actors in the telecommunications industry are engaging in a search for services that allow for value to the users, and profit to the providers.

One industry that is expected to benefit from the advent of more sophisticated mobile services is the travel and tourism industry. Travel and tourism is one of the world’s largest and fastest growing industries, generating 10 per cent of Gross Domestic Product (GDP) in the year 2002 and more than 198 million jobs worldwide. According to the World Travel and Tourism Council (WTTC, 2002), this contribution is expected to grow to 10.6 per cent of GDP by the year of 2012, and account for 249 million jobs across the globe. If successful mobile data services were to be introduced in this industry, its magnitude witness of an enormous potential for these services to raise operators’ ARPU.

Looking at the travel and tourism industry from a historical perspective, it should be noted that it has been an early adopter of new technologies and is in many ways the best example of an industry profoundly transformed by technology (Bloch *et al*., 1996). The use of IT started in the early days of computing, and has become increasingly intense, up to the point where it is probably the strongest driving force for changes within the tourism industry today

(Werthner & Klein, 1999). Take for instance the advent of the Internet. This electronic medium has had an immense impact on this industry, as it has provided all players with a means of reaching the end users and being reached by them (e-business watch, 2003). As a consequence of more and more tourists conducting business online, intermediaries residing in traditional physical sales channels have experienced lower business volume and difficulty maintaining business viability. Travel agencies especially are among those that find themselves in a vulnerable position, facing the threat of disintermediation.

Beside the historical perspective, there are also several other features of this industry which indicate it is suitable for the application of mobile data services and m-commerce. The main argument is that tourists are by definition mobile and outside their daily spheres, without access to the fixed Internet, which they increasingly rely upon to send and receive information. In the present-day situation, from the moment tourists leave their home the web has played its part, and they become helplessly dependent on acquiring information through other means, such as making telephone calls or visiting information desks. This does not necessarily have to be the case, not if they own a PDA or mobile telephone with wireless connectivity, then mobile commerce can continue to play roles in the travel experience itself. According to Eriksson (2003), the next generation's mobile terminal can function as an efficient tool for supporting the increasing demand for real-time information and improving the quality and efficiency of tourism services. The fact that tourism is a largely information based sector further suggests that it can be a leading/driving sector for the development of application and use of mobile terminals for the access to information. Ahonen (2002) means that another feature that promotes early development of 3G tourism services is the characteristic of travelling businessmen within this industry. These have urgent needs, they are often among the first to have the necessary terminals, and often they are not as price sensitive as other local customers. Furthermore, it was mentioned that the structure of demand and supply in the tourism industry is currently undergoing significant changes as tourists and travellers have realised the benefits of using electronic means. Travel is currently the leading e-commerce product on the fixed Internet in Europe, and while it took years for the majority of the population to adapt to electronic commerce, the adaptation has been made. Porting the functionality in new, more useful ways will ultimately light the fuse, at which point m-commerce will explode (Easton, 2002). The IT and telecommunication analyst company IDC estimates that more than 23 million Europeans will use their mobile phones to buy travel products and services by 2005 (m-travel, 2003).

This thesis is conducted by request of CDT (The Centre for Distance-spanning Technology) in Luleå. CDT is a joint venture R&D institution owned by the core partners Luleå University of Technology, Ericsson, Frontec, TeliaSonera and Teracom, which focuses on research activities related to wireless technologies and applications. The Ericsson research unit in Luleå is also actively supporting the thesis as part of their work to enhance knowledge of business models, drivers and barriers in emerging mobile markets.

1.2 Problem Discussion

In the previous section it was outlined that the telecommunication industry is currently in a slump and that it is of utmost importance that attractive mobile data services be developed in order to finance the heavy costs that the 3G licence acquiring and network building have resulted in. It was also stated that one industry that is believed to benefit from the introduction of 3G mobile technology, due to its inherent characteristics, is the travel and tourism industry. Dimitri Buhalis, a researcher in the field of information technology and tourism, have stated that information is the lifeblood of the travel and tourism industry, and as a consequence, the effective use of information and communication technology is crucial for its competitiveness and prosperity (Gartner & Lime, 2000). Bearing his statement in mind, and with the latest 3G technology in mobile telecommunication being unveiled, an essential question to be addressed is; is it possible for players in the tourism industry to leverage the new mobile data technology in order to add value to the experience of tourists, and in the process of doing so, increase their competitiveness and prosper?

Especially important is tourism for rural areas that are experiencing declining economic activity, dwindling rural industrialisation and out-migration of higher educated youth, as it may provide an alternative development strategy for economic and social regeneration. One such region, in which tourism is expected to play an important role in the future, is Norrbotten. The Swedish minister for industry and trade, Leif Pagrotsky, has recognised and commented on the importance of tourism for the economic development of this region. (Norrbottens Kuriren, 2004).

Against this background, the forthcoming of new mobile data technology alongside the need for development of the tourism industry in Norrbotten, the following initial area of research has emerged.

"How can the introduction of new mobile data technology enhance the value creation process of actors in the tourism industry in Norrbotten"

1.3 Delimitations

Mobile data services and applications can either be consumer oriented or business oriented. Services belonging to the former category are designed to be used by individuals in their personal everyday activities, while the latter are used by companies as a means to achieve internal efficiencies. The principal of this thesis (CDT) has requested that the focus of this particular study lies on business-to-consumer (B2C) mobile data services and applications intended to be offered to tourists. Possible business-to-business (B2B) or intra-business services are of secondary interest and will only be subject for discussion in cases where they are closely connected to the creation of B2C services.

1.4 Outline of this Thesis

The structure of this report is presented below. This overview is intended to be somewhat more descriptive than the table of contents.

Chapter 2 provides an overview of the literature that has been deemed relevant for the stated initial area of research. It covers areas such as general characteristics of the tourism industry, characteristics of mobile data services for tourism, players and roles in the mobile content value map, business models and determinants for IT adoption among small companies. The chapter concludes with the definition of a research problem within the initial research area, and a couple of supporting research questions.

In *chapter 3* the theoretical frame of reference is presented. It provides a deeper understanding of the main things being studied by defining the concepts found in the research questions.

The methodology used for this research is presented in *chapter 4*. It describes and justifies the purpose of the research, its approach, the sample selection, the data and data collection as well the measures that have been taken to ensure the quality of the study.

The empirical data that were obtained from the interviews is put forward in *chapter 5* and analysed against theory in *chapter 6*.

The thesis concludes with chapter 7, which presents findings and conclusions of this research and also briefly gives suggestions for further studies.

´If the facts don't fit the theory, change the facts.'

- Albert Einstein

Chapter 2 – Literature Overview

This chapter gives an overview of literature that in accordance with the stated research area is relevant for this study. Initially, general theory regarding the tourism industry will be subject for discussion. This includes a definition of the industry along with a presentation of some of its characteristics. Thereafter, its complex nature is delineated, involving an identification of the sectors it encompasses, its structure, and the roles and activities of different actors. The second literature area discusses characteristics of new mobile data technology and how it is believed to contribute to tourists' needs. This includes reviewing some examples of applications that have been tested and evaluated in Europe. The mobile content value map demonstrates the processes needed in order to deliver mobile content to end users and will be subject for discussion in the third literature area of focus. Thereafter, business models will be discussed. In order for business actors to engage in the provision of mobile tourism content it is imperative that a viable business model is established. Furthermore, theory regarding IT adoption will be reviewed. It was stated in the introduction chapter that this research is particularly concerned with reviewing the impact of 3G mobile data technology on the tourism industry in Norrbotten. As a consequence of this industry exclusively consisting of Small and Medium sized Enterprises (SMEs) with less than 250 employees, it is especially relevant to address theory on IT adoption by SMEs.

2.1 Travel & Tourism Industry

2.1.1 Definition of travel and tourism

Generally speaking, tourism involves a wide range of activities (transport, accommodation, restaurants, cultural activities, leisure) and could be more effectively viewed and evaluated as a market rather than an industry (e-business watch, 2002). As it incorporates many different sectors there is no obvious, clear-cut division of what is to be considered part of the travel and tourism industry and what is to be left out. According to Swarbrooke and Horner (1999), tourism can be described as an activity which is serviced by a number of other industries such as hospitality and transport. Among the attempts to provide a general definition of tourism are those of Prisma and The World Tourism Organisation (WTO). Prisma (2003) sees tourism as "a conglomerate of all those individuals and organisations that are involved in the production, distribution and consumption of travel and tourism products", whereas WTO has defined tourism as comprising "the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business, and other purposes" (Middleton & Clarke, 2001).

Tourism is an important part of modern societies and plays a crucial role within many economies, among them the European. Because of the industry's diversity, it impacts a wide range of sectors, affecting social, cultural and economic life (Prisma, 2003). Measuring the entire travel and tourism related economic activity; the travel and tourism industry is identified as the world's largest industry in terms of GDP. The World Travel and Tourism Council (WTTC) expects the industry to account for 10,6% of the world's total GDP by the year 2012, and by this time employ more than 249 million people (WTTC, 2002). These numbers confirm WTTC's statement that travel and tourism will be one of the leading industries in the next century, besides IT and telecommunication (Werthner & Klein, 1999).

It may be necessary to clarify one potential source of confusion, namely, if there is any difference between *tourism* and *travel*, used on their own as single terms, and *travel and tourism* used as a combined term. In normal usage *tourism* and *travel and tourism* are terms that relate to exactly the same market and they are therefore used interchangeably in this thesis.

2.1.2 The component sectors of the tourism industry

The five main component sectors of the travel and tourism industry are the accommodation sector, the attraction sector, the transport sector, the travel organisers' sector, and the destination organisation sector. These comprise several sub sectors, all of which are increasingly concerned with marketing activities, both in the design of their products and the management of demand (Middleton & Clarke, 2001). *Figure 2-1* illustrates the five main sectors and a selection of their sub sectors.

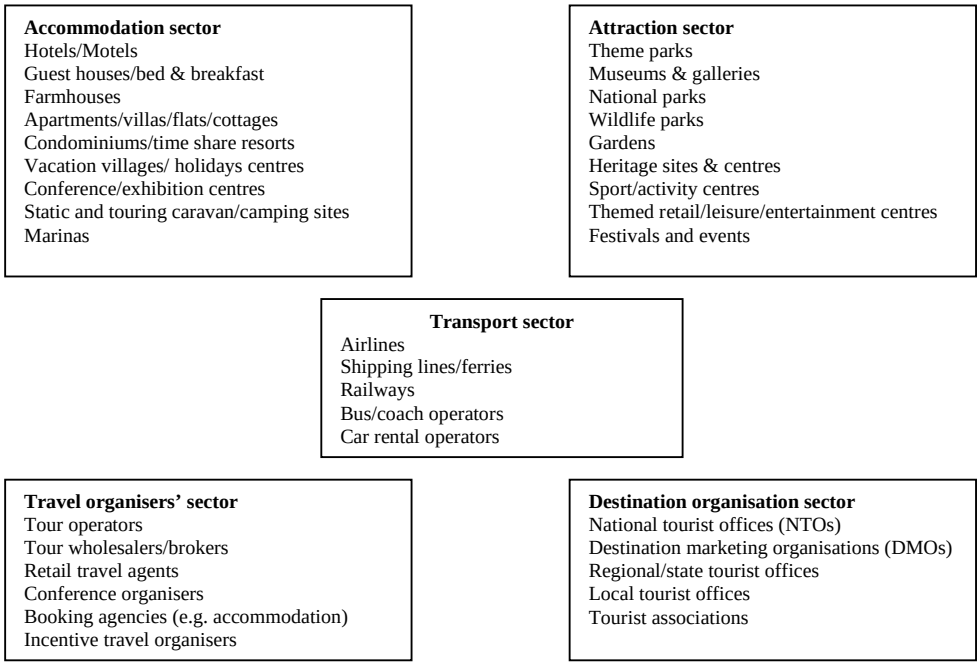

Figure 2-1, The five main sectors of the travel and tourism industry (Source: Middleton & Clarke, 2001)

The sub sectors represented in *figure 2-1* can be divided into those that are fully commercial, those that are operated commercially for purposes other than profit, and also those that are in the public sector and that operates mainly on a non-commercial basis. In the first category are most sub sectors from the accommodation, transport sector and travel organisers' sector. In the second category are many attractions, such as safari parks and heritage sites, and in the third category many state-owned national museums, national parks and most of the operations undertaken by tourist offices. (ibid)

2.1.3 Structure of the travel and tourism market

Figure 2-2 on the next page represents a functional and structural view of the tourism and travel industry. It differentiates between the supply side and demand side and the respective intermediaries. The links mark the relationships present within the industry as well as the flow of information. Only the most relevant links are depicted, and the nodes denote the relevant types of players in the field. The intermediaries that are on the right side are the commercial link between the supplier and the consumer. This side also show the financial flow. The left side shows entities responsible for destination management, planning, administration, marketing and branding of a destination. These entities often act on behalf of all the suppliers within a destination and are not part of the booking process. (Werther & Klein, 1999)

The figure offers a generalised picture of the industry, its players and their relationships. However, it should be noticed that in reality nearly all players are interacting. For instance, destination management organisations interact with tour operators as well as with travel agents, however, their primary working relationship is with suppliers and local tourist boards within their destination. One specific characteristic of the travel and tourism industry is, according to Werther and Klein (1999), that on the supply side the industry acts as a network where different suppliers and intermediaries cooperate to offer the final product to the consumer. In order to understand the roles of the intermediaries a brief description is necessary.

Primary suppliers

The primary suppliers represent the large group producing the basic tourist components such as accommodation, entertainment and catering. This category thus consists of enterprises such as hotels, restaurants, attractions, which are mostly SMEs. It is a known fact that SMEs are critical for maintaining and creating jobs, which explains the specific role of tourism for regional development and economic prosperity. Their size poses a disadvantage as small suppliers normally have little know how about marketing and technology, little knowledge about market developments and rather limited access to distribution channels. Whereas other sectors of the tourism industry can be seen as early adopters of new technologies, this sector is normally lagging behind. (ibid)

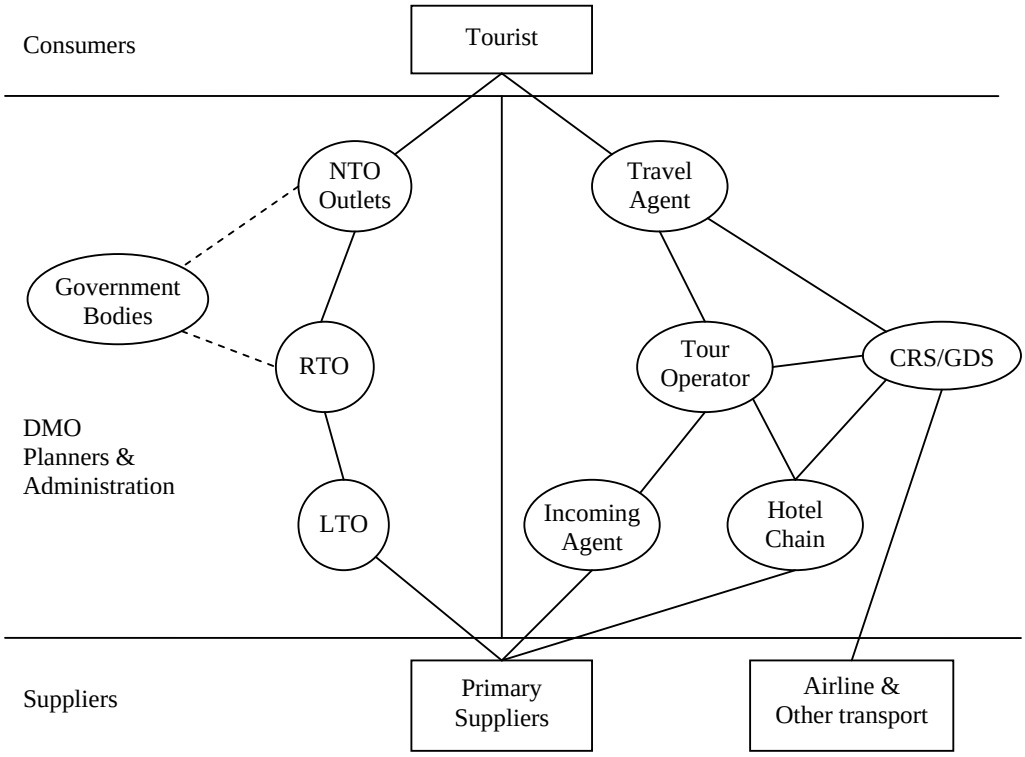

Figure 2-2, Structural view of the tourism industry (Source: Werther & Klein, 1999)

The term Destination Management Organisation (DMO) is a common name for tourist organisations that act on three different levels. On the highest national level are National Tourist Organisations (NTOs) found. Thereafter are Regional Touirst Organisations (RTOs), which operate on a regional basis, and on the lowest level Local Tourist Organisations (LTOs). The term Computerised Reservation System (CRS) denotes electronic airline reservation systems, used for managing flight and seat inventories for sales and operation purposes. Global Distribution System (GDS) describes a network of one or more CRS for distributing product offers and functionalities of the participating networks in different countries of the world.

Airlines & other transport

According to Werther and Klein (1999), this is the most technology intense sector in the industry, with growing importance due to the trend towards long haul tourism. Airlines are currently experiencing a crisis due to several reasons. For instance, instability in the current international political climate has caused a sharp decline in travel. Also, the industry has been hit with skyrocketing fuel and insurance costs, and while airline travel has declined, airline capacity has not, creating a tremendous overcapacity in the industry. Major airlines are facing increased competition from low cost carriers and low cost Internet fare services. These are just a few of the issues the airline sector is currently dealing with (Laborsearch, 2003).

Also other types of transport suppliers, such as car rentals, railways and the maritime industry, are included in this category, which are all technologically advanced. (Werther & Klein, 1999)

Hotel Chains

This group is situated on both the supplier and intermediary side for one reason. Many chains represent marketing and operation units while the accommodation is owned by a different unit. This category is dominated by US multinational corporations that focus on higher priced market segments, with well-established reservation centres. (ibid)

Tour Operators

Tour operators can be seen as product aggregators that bundle basic products or components to create a "new" product. They purchase and assemble a large number of components produced by the suppliers and sell them as packaged products. The value they add to the production process is through the aggregation function. In addition, they also conduct the main marketing and distribution activities and share financial risk in terms of unsold stock. Suppliers can benefit from working with tour operators as these have good access to markets and also in that the financial risk can partially be passed on to the tour operator. The advantage of the tour operator is that lower prices can be negotiated, which is attractive for the end consumer, and hence may lead to increases in sales volume. There are several important features of tour operators, e.g. they own brands well known in the tourism sector and they possess knowledge about product aggregation and marketing. (ibid)

The incoming agents, also represented in *figure 2-2*, act within a destination on behalf of one or more tour operators. Their task is to take care of the local operation and to keep the contact with the suppliers within the destination. They can act either in the name of the tour operator or as a real middleman. Tour operators can also choose to perform the local activities themselves without the help of incoming agents. (ibid)

Travel agents

Travel agents can be viewed as information brokers, providing the consumer with information and booking facilities. Their contact on the supply side is with the tour operators. The travel agents generate their revenue through commissions, a percentage of the product price. Similarly to the primary suppliers, travel agents are mostly SMEs that are under pressure by commission reduction strategies from both tour operators as well as airlines. (ibid)

Travel agents are part of the international electronic distribution network constituted by the CRS/GDS (Computerised Reservation Systems/Global Distribution Systems). These systems allow them to access the products of tour operators; perform reservations as well as billing tasks.

CRS/GDS

The term CRS (Computerised Reservation Systems) denotes electronic airline reservation systems, used for managing flight and seat inventories for sales and operation purposes. The term GDS (Global Distribution Systems) describes a network of one or more CRS for distributing product offers and functionalities of the participating networks in different countries in the world. Also other products, such as accommodations, car rentals, cruises, or tour operator products are included in the GDS (ibid). The supply of GDS services is presently highly concentrated, with four global suppliers owned by airline companies: Sabre, Amadeus, Galileo International and Worldspan (e-business watch, 2003). Their presence is

based upon a network of agreements with local partners ensuring access to travel agencies all over the world.

Destination Management Organisation (DMO)

Werther and Klein (1999) explain that the tasks of the DMOs are manifold. They are responsible for destination management, planning activities, marketing/branding of the entire destination, training and education, and they are very often also engaged in the daily operation. DMOs have a political function as their objective is to promote tourism in a destination by maintaining the social, cultural, economic and environmental basis. As was mentioned earlier, they represent all the actors within a destination in a democratic way, without favouring a single group of actors. DMOs are often genuine governmental institutions and can be viewed as non-computerised information systems as they gather information about a local, regional or national tourism product and distribute it world-wide. Furthermore, they act as an information system the opposite direction as well, informing suppliers about current trends, the general market situation and national and international competition. The DMOs acting on a national basis are denoted National Tourist Organisations (NTOs), and the ones acting on a regional and local basis are denoted Regional Tourist Organisations (RTOs) and Local Tourist Organisations (LTOs) respectively.

2.2 The Tourism Industry and Mobile Services

The tourism industry is a service sector that is extremely complex and demand-driven, meaning that the tourist directly influences the offer. The diversity of players found within this industry along with their geographical distribution contributes to a wide diversity of products and a highly fragmented offer. Considering these inherent industry characteristics, the access to information by the tourist, for the promotion of tourism products and destinations is a key element of the business chain. (Eriksson, 2003)

The access to tourism information can be facilitated by the mobile information society as it is developing rapidly towards the third generation mobile telecommunication technology. In this development process the Internet and its services are coming to wireless devices. It is necessary to give a definition of the mobile Internet in order to avoid misconceptions. Sadeh (2002) informs that, contrary to common belief, the mobile Internet is not just an extension of the fixed Internet to mobile terminals. There are both technical and usage aspects of the mobile Internet that requires us to rethink the way applications and services are to be developed. Things to consider are for instance the input/output limitations of the mobile terminals and the time-critical nature of many of the tasks in which mobile users engage. Devine and Holmqvist (2001) define the mobile Internet as “any data transaction conducted over a mobile communication system”. This broad definition encompasses all sorts of data traffic, i.e. non-voice traffic, including SMS, e-mail, downloading websites and advertising.

2.2.1 Characteristics of tourism mobile data services

The European commission working group “Mobile services for tourism”, which was created in mid-2002, have highlighted the key aspects and components to be addressed by mobile

services in order to have an impact on the tourism industry. It has identified two categories of mobile tourism services (Eriksson, 2003):

- Mobile services as an additional channel of information and tourism service distribution. This basically means that the tourist has access to the same information as on the fixed Internet, only difference is that he is connected through a mobile terminal.

- Mobile services as a basis for new innovative tourism services. Around the globe mobile operators have started to deploy positioning technologies that enable them to pinpoint the location of their users. These technologies stimulate the development of applications and services capable of taking tourists' location into account.

The working group emphasises that a mobile service should be seen as part of the tourism services, and as such should be compatible (in particular from a content point of view) with fixed services (in particular for services accessible through the Internet). Furthermore, it recognises three major parts in the broader structure of how information flows from a provider to a customer's mobile device (content, customisation and filters). Within these three parts, there are different components that need to be taken into consideration. This is illustrated in *figure 2-3*.

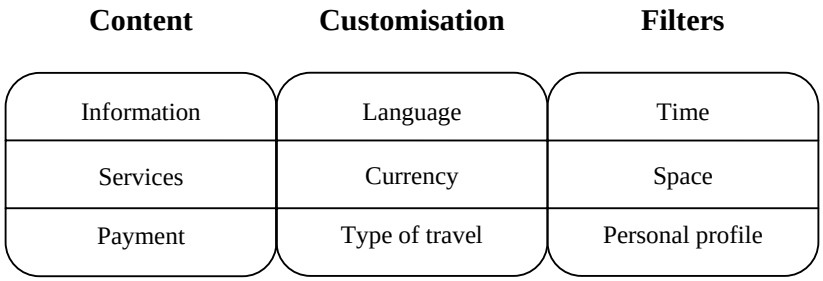

Figure 2-3, Components of a mobile data service for the tourism industry (Source: Eriksson, 2003)

Content

Eriksson (2003) informs that tourists generally require accurate, current and relevant information about a multitude of topics when on the move, e.g. sites, accommodations, restaurants, performances, schedules, routes, guide support, history. Today, the most common ways of serving customers with information during their trip is by printed material handed over at a front desk, or by speaking directly to customers one by one at a front desk or over the phone. There are obvious limitations and drawbacks of both these methods. For instance, printed material is expensive and needs to be updated frequently, and the cost of serving customers by talking directly to them is extremely high.

The ideal tourist service is a one-to-one service, in the tourist's preferred language, with a 24 hour a day/7 days a week, all year around availability and with customised, constantly up-to-date information and flexible services. Mobile services can fulfil many of these needs and

provide better service at a lower cost than traditional methods if they are based on concepts such as self service, user needs and multi language (ibid).

It should be noted that tourists desire more types of content than just simple information. The concept of content covers (ibid):

1. Information

   - events, accommodations, attractions, shopping, points of interest etc.

2. Application services

   - timetables, tickets, availability, bookings/reservations, emergency services etc.

   - geographically related services such as positioning and location based services.

   - directions, maps, roads, weather reports

3. Payment options

Customisation

Just as in any type of personal service (printed material or the fixed Internet), mobile services too must overcome the language barriers and translate the information and applications into the preferred language of tourists. The customisation could also include conversion of currencies. (ibid)

Filters

This concept deals with the filtering of irrelevant information and is one of the greatest challenges for mobile services. For the most part users want their mobile device to allow them to gain time. They want to access the requested information or application without having to search for this in a sea of non-relevant information. Andersen (2002) concludes that the browsing behaviour that is common on the fixed Internet will be much less prevalent when it comes to mobile data services. Eriksson (2003) holds up time, location and personal profile as three important filters:

1. Time

   - the time filter adapts the information depending on the time of the day. For instance, if the tourist has agreed to receive push-marketing messages, the time filter would assure him/her that discount coupons received are relevant for the specific moment in time.

2. Location

   - a location filter keeps track of the tourist's current location and adapts it to offer him/her the most appropriate service or information depending on where he/she is. For instance, if the tourist requests a map, the service should provide the map of the city or surrounding in which the user currently is. The service should move beyond any location as the tourist leaves the designated area. (Ahonen, 2002)

Location-based services are by many seen as the "killer application" for mobile services (Schmidt-Belz *et al*., 2002). Many surveys suggest that a large percentage of mobile users are eager to have access to location-based services and are also willing to pay for them. Leading research firms predict that location-based services could generate as much as $20 billion a year in revenue by 2006 (Sadeh, 2002)

3. Personal profile

   - Personalisation is seen as one of the key features to facilitate the use of complex services on mobile devices. Sadeh (2002) explains that the need for personalisation stems from the input/output limitations of the devices and the time-critical nature of the services they are meant to support. Robins (2003) argues that since mobile phones are individually identifiable, meaning in most cases there is but one user, they are well-suited for the provision of accurately personalised services and information.

2.2.2 Delivery modes (Push vs. Pull)

Easton (2002) informs that one of the big questions surrounding location based commerce is how the information is obtained. There are two options. The "pull" scenario occurs when information is specifically requested by the user. The flipside is the "push" model, where information is sent to the user automatically. One of the most important issues regarding location is privacy protection. Location information is valuable because it enables companies to send direct marketing at the right time, when the potential consumer is in the right place (Rodríguez Casal, 2003). Location-sensitivity marketing will be a completely opt-in arrangement – like a radio, consumers will be able to activate and deactivate it according to their wishes (Easton, 2002; Sadeh, 2002). The privacy issue will not be subject for further discussion at this point. However, it is important to notice that legislation and a "code of good practice" are needed to prevent and solve aggressions to individual privacy rights.

Research show that there exist ambiguity concerning consumer attitudes towards push-marketing practices. In a survey by Stelacon (2003), Swedish users declared their perception of advertising in the mobile phone as negative. This, however, contradicts the result from a survey by Accenture of US and UK mobile phone and PDA users that concluded many users were happy to receive unsolicited promotional messages as long as these were personalised and relevant (Robins, 2003).

2.2.3 Examples of mobile data services in the tourism industry

This section reviews some of the projects on mobile tourism services that recently have been tested in different locations throughout Europe. This selection of projects is the result of an Internet search and should not in any way be seen as exclusive. A more extensive search could quite possibly reveal many other similar projects. The tourism projects found were mCity, LoL@, m-ToGuide and CRUMPET.

mCity

mCity Stockholm is a pilot project that aims at introducing user friendly mobile services for citizens, companies and visitors in Stockholm. The project is tested in the Maria-Gamla stan

City District in an open collaboration with industry. The project is financed by the City of Stockholm and is run jointly by The Maria-Gamla stan District Administration and The City of Stockholm Economic Development Agency (Stockholm, 2004). In an attempt to increase the level of service, tourists are able to access information on current events in Stockholm through a WAP-portal. The WAP-based portal is synchronised with the City of Stockholm's event database (Stelacon, 2003).

LoL@ (Local Location Assistant)

This project was initiated at the Telecommunications Research Center in Vienna in 2000 with the aim of investigating location-based multi-media UMTS applications. LoL@ is a research prototype of a mobile tourist guide designed for tourists visiting the city center of Vienna. The application provides predefined tours through the city center, information about the sights (called PoIs, points of interest), navigation and routing, multi-modal interaction, and an electronic tour diary; LoL@ acts as an "interactive version" of the classic printed guidebook (Umlauft *et al*., 2002).

The tour diary is stored on the application provider's server. This allows retrieval after returning from the trip and access for people staying at home during the trip. A readily available tour diary was deemed of great importance because most tourists who do not file their photos in an album or record their memories right away will never do so. Today, many tourists use Internet cafés in order to report from their trips. The tour diary in LoL@ substitutes this function by allowing tourists, via their mobile phones, to enter data without needing external infrastructure like an Internet café. With digital cameras connected to, or integrated into the terminal, people are able to upload pictures directly via the mobile phone. (ibid)

m-ToGuide

The IST (Information Society Technologies) project m-ToGuide started in May 2002 with the objective to develop and deploy a handy electronic tourist guide targeted to the European tourism market. Its vision has been to provide the traveller with up-to-date, location-based, personalised tourist information and services in a single handheld device. GSM/GPRS cellular telephone networks and the Internet have provided the transmission backbone of the system. The m-ToGuide guides the tourist through the City via GPS and offers location-specific multimedia information about major monuments and points of interest. (m-ToGuide newsletter3, 2003)

Through the m-ToGuide the tourist has available to him/her the most relevant and current data. It enables the user to gain immediate access to information or services that he/she is seeking, e.g. attractions, shopping, places of interest, directions. For instance, the m-ToGuide can show the tourist his/her location, using the most suitable format of map or photograph. It might then direct him/her to the next point and identify the best method of available transportation. Further, m-ToGuide would propose a list of worthwhile attractions or entertainment options which are near-by and relevant in time. Should the tourist accept, m-ToGuide would propose purchasing him/her tickets or placing a reservation. (ibid)

Evaluation of the m-ToGuide trials, conducted in London, Madrid and Siena during may to august 2003, showed that tourists found that the rich multimedia content for monuments, points of interest and offered tours, etc. in particular was a very strong draw for this type of application. However, it was also indicated that their system needs improvements regarding the size and loading time of the device, the GPS performance and the prices that had been pre-defined. The test users pointed out that the most convenient place to pick up an m-ToGuide would be at local tourist offices, hotels and airports. (ibid)

CRUMPET (Creation of User-friendly Mobile services Personalised for Touristm)

This is another European IST funded project that is similar to the LoL@ and m-ToGuide projects described above. The goal of this project has been, as the name suggests, to create user-friendly mobile services personalised for tourism. Full-user field tests have been performed in Heidelberg and Helsinki during 2003.

The evaluation of the CRUMPET project corroborated the importance of location-based services, based on user localisation, locally available services, and personalised recommendations. Interactive maps, especially when enhanced by highlighting the current position of the user, sites of personal interest or tours, ranked high in a mobile tourist support. Recommendations about places of interest, restaurants, events, and accommodation were concluded as indispensable in a mobile tourism support. Information about transportation, culture and nature also ranked very high among the information needs of travelling people. (CRUMPET, 2003)

Of the users involved in the trial, a convincing majority approved of the added values of the system compared to other tourism support available today. A high percentage of the users seemed to be prepared to pay for such a mobile tourism service. Their preferred mode of payment would be subscription, i.e. paying once for a period of usage. (ibid)

2.3 The Mobile Content Value Map

The value chain concept was originally coined by Michael Porter, who saw it as a means to describe the internal processes of a firm. His conceptualisation of the value chain was primarily targeted toward manufacturing firms, in which the value of activities is mostly concerned with the physical flow of material. Subsequent researchers have also used the value chain to describe the activities that takes place as one product passes through different actors in the market. Like any product or service, mobile data services involve a number of players in a chain of value-adding activities that terminates with the end user. Hence, researchers speak of the m-commerce value chain (Barnes, 2002; E-business strategy, 2004; Buellingen & Woerter, 2002). Other researchers (e.g. Andersen, 2002) have chosen to call this process the value map, as they see some of the performed activities overlapping each other.

The value map of the mobile data industry is comprised of seven interrelated roles. It can basically be seen as the integration of the value maps from two separate industries - those of the mobile voice and the media/content industries. Since this integration is a recent phenomenon, driven by the technological development of bringing media and content to mobile devices, these roles have not yet crystallised. The incorporation of a media-based

content industry with the technology-based mobile voice industry raises a number of complex issues that needs to be resolved (Andersen, 2002). Dixner *et al*. (2003) have commented on some of these issues.

In the case of mobile voice services, many of the providing roles are currently assumed by mobile operators. The provision of mobile data services, on the other hand, will delimit the different roles into more precise sub-roles. This will potentially enable players to take-up some of the roles that have traditionally been taken on by others (Andersen, 2002). *Figure 2-4* illustrates the different roles that need to be adopted for providing mobile content services.

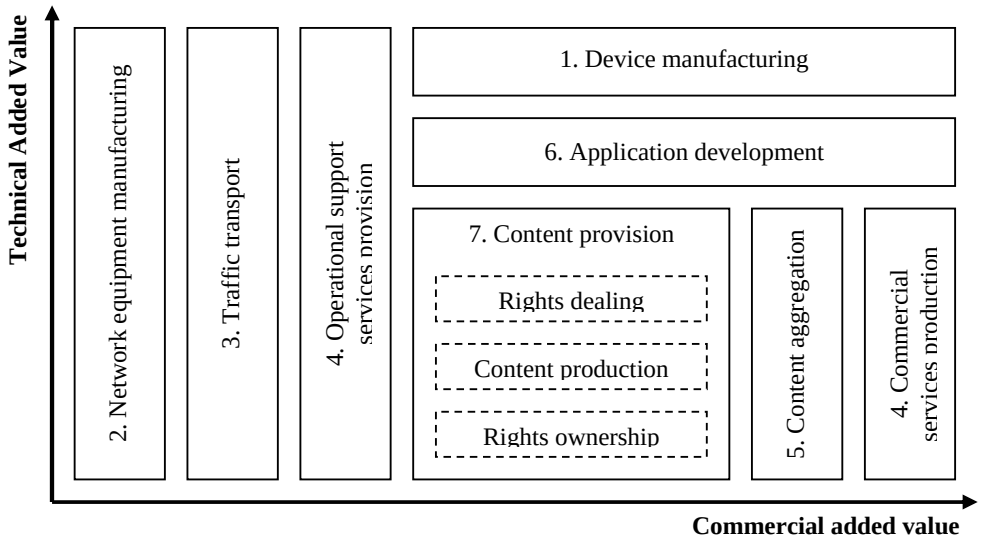

Figure 2-4, Roles in the mobile content industry (Source: Andersen, 2002)

Each of these roles as well as the players likely to take-up these roles are described in more detail below:

2.3.1 Device manufacturing

Actors active in this role deal with the development and the marketing of end-user mobile devices that are used to access mobile data services. Mobile device manufacturers are key players in the mobile content value map, as their design decisions on functionality and standards ultimately sets conditions for other players in the map.

Andersen (2002) predicts that in the future an increase in the number of types of devices that will be used is likely to happen. Different content-based applications all require that the device on which they run have different features in hardware and software. Therefore, it claims, the advent of mobile data will see the entrance of players from outside the traditional handset manufacturing industry. This is already happening as players from the consumer electronics (e.g. Panasonic and Samsung) and computing and PDA industries (e.g. PalmOne) have taken the leap into this category. According to an article writer in Dagens Industri,

(Ericsson's P900, 2003), analysts claim that Palms with an integrated phone will be the mobile devices of the future.

2.3.2 Network equipment manufacturing

This category in the value map involves players that develop and manufacture the network equipment over which mobile services are delivered (e.g. Ericsson, Nokia, Lucent, Cisco etc.). Since these players provide the mobile air interface and service infrastructure, routers and switches to mobile network operators (Andersen, 2002), their innovative capabilities are drivers for the next wave of technological development (Barnes, 2002).

Andersen (2002) informs that the future role of the network infrastructure manufacturer will be to ensure that the different network technologies are able to deliver the higher bandwidth and to ensure that different network technologies can co-exist. In order to ensure interoperability of network technologies network manufacturers will follow recommendations from standards definition bodies such as 3GPP (The 3rd Generation Partnership Project).

2.3.3 Traffic transport

Found within this value map segment are operators of the mobile networks that ensure the maintenance and the operations of the mobile network transmission infrastructure. In Sweden, players such as Telia Sonera, Vodafone, 3, and Tele2 currently assume this role.

The core competence of mobile network operators (MNO) has always been to ensure the operational management of mobile networks. It is their responsibility to ensure that different applications – both voice and data, are delivered in a satisfactory manner. This implies that they have a series of roles to play including (ibid):

- Service assurance: network service agreements, network incident management and network service quality management;
- Service provisioning and management: Network service provisioning, roaming management, network infrastructure management (planning, installation and load analysis);

2.3.4 Service provision

The service provision role can be sub-divided into technical and commercial service provision. Currently, in the case of mobile voice services, both these roles are mostly assumed by the mobile network operators. In the mobile data market, however, these roles could be taken up by two different types of players. In such a situation is it imperative that these players collaborate closely in order to fully assume their separate roles. (ibid)

Technical service provision

The technical service providers are the players that ensure the investments in technical platforms to support service provision such as managing the billing and customer care platforms. With mobile voice services, this role has been assumed by the mobile operators. (ibid)

Andersen (2002) stresses that as mobile technology goes from voice to data the role of the technical service provider will be extended and become significantly more complex. Essential for the development of mobile data services is the existence of certain enabling technologies, e.g. systems for content management, personalisation, billing mechanisms and user localisation platforms.

It is likely that mobile operators will want to position themselves in this role, given their current position as mobile voice service provider. However, Andersen (2002) points out that there may also be other players in the industry who want to, or have to, assume this role. The player that assumes the portal function is likely to require access to the technical service providers' systems. Mobile portals will be discussed in subsequent sections.

Commercial service provision

The players acting as commercial service providers ensure the market facing aspects of providing the mobile content services. This involves sales and marketing roles, such as channel management (distribution channel), new and existing product development, brand development and public relations. (ibid)

It was mentioned that mobile operators currently assume the role of the commercial service provider for the provision of voice services. They are also well positioned to assume this role in the mobile data market given their access to mobile network infrastructures and their ability to market combined voice and data thereby leveraging their existing brand for mobile voice services. (ibid)

However, operators are not the only players that aspire to assume the commercial service provider role. Since this role involves managing customer relationship and developing brand awareness for mobile data services, there is a range of players that potentially vie for this role. In the future, Andersen (2002) explains, a number of players will be positioned to assume the commercial service provider role. In order to do so, however, these players will need to gain access to mobile operators' network infrastructure as well as provide the necessary level of technical services. Therefore, the player assuming this role, apart from the network operator, can be considered as a mobile virtual network operator (MVNO) (ibid). A MVNO characteristic is that is does not own infrastructure, but buys access from other MNOs. Examples of MNOs in the Swedish market are TeliaSonera and 3, while Sence Communications and djuice are examples of MVNOs.

2.3.5 Content aggregation

Firms that are operating as content aggregators focus on creating value by assembling content from multiple sources. They function as middlemen between the content originators and the distributors. They justify their place in the value map by providing value to content originators by negotiating intricate and time-consuming distribution deals with individual operators, resulting in wider content distribution (E-business strategy, 2004). For the operators, content aggregators create turnkey mobile data applications by combining content from numerous sources and integrating it into a single interface (ibid).

Mobile portals are content aggregators that act as the windows into the mobile world through which customers access the content. Their only concern is to collect content, by offering content providers a channel on which to market their information, and not to add content or services themselves (Devine & Holmqvist, 2001). Andersen (2002) emphasises that the portal or content aggregation role is different to that of the commercial service provision role described above. Therefore, it is possible that two different players will take on these two distinct roles.

The UMTS Forum report #13, distinguishes between non-portal and portal aggregation (Ahonen, 2002), the former function being a lower level of content aggregation than the latter. For instance, CELLUS is a non-portal content aggregator that aggregates many different content sources (ringing tones, logos, games etc.). This service is part of the operator Telia Sonera's Telia Go service, which is an example of the higher level of portal content aggregator.

Mobile portals represent an increasingly popular business strategy with many companies moving quickly to secure a place in the market (ebstrategy.com, 2004). Different types of portals can be classified in terms of their level of content aggregation, and depending on this level of aggregation they can range from being very simple to being very complex to manage (Andersen, 2002). Andersen (2002) distinguishes between portals that use either high or low level of content aggregation. The low level portals are similar to the browser softwares found on the fixed Internet which allow users to save links towards the content, and then save the links on the device hardware. At the other end of the spectrum is the high content aggregation portal, which partially stores the personal menu of favourite links on the device and stores most of it on the server of the portal provider.

Potential players assuming the portal role

There are different types of players that could assume the portal role. Network operators are obvious candidates as they are the ones currently having the billing relationship with the customers for voice services (ebstrategy.com, 2004). There are also other capabilities that put operators in an especially prominent position to establish their own portals. First of all, they are capable of determining the location of every individual handset roaming in their network. Therefore, partnerships with them are required in order to create location-based services (LBS). Secondly, operators can pre-configure the mobile devices to contact their portals directly without further settings. Content providers that have partnerships with operator portals should be able to benefit from a wide subscriber base and regular visitors (Paavilainen, 2002).

Other potential players for assuming the mobile portal role are fixed Internet portals and content providers. Fixed Internet portals have previous experience in the creation, packaging, and aggregation of digital content. Furthermore, they have relatively low deployment costs given that they have most of the required infrastructure, and also, they have already established partnerships will content providers. If one were to build on the experience from the fixed Internet, content providers such as news or travel information providers, could also be potential candidates to launch their own mobile portals. (Andersen, 2002)

Portals have an important role to play not only as a gateway for customers to access and personalise mobile data services, but also for facilitating the distribution process of content providers. As content providers do not possess the required technical capabilities themselves, they rely on portals to support the distribution of their content. If portals are not able to provide the content providers with these services, many content providers will probably choose not to make their content accessible through mobile devices. In order for portals to provide these supporting services they will need to have access to the player assuming the technical service provider function described above (e.g. operators). (ibid)

2.3.6 Application development/application provision

Firm's belonging to this category are ones that either develop applications for use on mobile devices (e.g. games) or develop applications that allow the delivery of content in a format that adds value to the end-user (Andersen, 2002).

The application developers have an essential role to play in the development of the mobile data market. These can deliver solutions to application providers, device manufacturers (e.g. embedded software such as micro-browsers), or content aggregators/portals. Companies residing in this value map segment either develop their own application or purchase them from application developers. (ibid)

2.3.7 Content provision

It has been mentioned that the next-generation of mobile communication networks and devices will allow for richer content to be sent and received. In addition to text, audio, and still graphics, this includes video files and content that has been adapted to one's physical location. Such content can be easily modified, consumed repeatedly by the same or different users, and is fast and cheap to reproduce (Barnes, 2002). The content is at the heart of the value map as it is the element that will generate revenue. As users are not interested in the technology itself, but in the benefits it allows them to enjoy, they will only agree to pay for content they expect will yield some sort of benefit.

Content providers are responsible for the production and packaging of content for distribution over mobile devices. Andersen (2002) informs that they could be responsible for the creation of ideas, the organisation of the production and the delivery of any facilities as a whole or any separate part.

There are some important issues that arise regarding the provision of content via the mobile Internet. For instance, the level of interactivity and customisation (dynamic vs. generalised content), time-dependence (e.g. real-time information vs. a dictionary), intensity of use (used once, several or many times), operational format (executable vs. fixed document), pricing (e.g. based on usage, subscription or commission), and externalities (who gains and loses from consumption, e.g. positive externalities from positive reviews and negative externalities from illegal copyright infringement). (Barnes, 2002)

2.4 Business Models

"Business model" is a term that is often used to describe the key components of a given business. This concept has recently been particularly popular among e-businesses, and within research on e-business, due to many researchers recognising that the accelerating growth of information and communication technologies (ICTs) will transform traditional business models, or develop new ones that better exploit the opportunities enabled by technical innovations (Pateli & Giaglis, 2003a). However, this body of literature has not used the term with consistency, and hence a range of definitions for business models have been proposed (Vassilopoulou, 2003). Some speak of "Internet business models", some others of "e-Business models" or "Business models on the Web", and others speak generally of business models.

The motivation for studying business models naturally varies depending on the research interests of the investigators, their viewpoint, background, and study objectives. Being aware of these factors helps at better conceiving the complementarities, overlaps, and potential conflicts of opinions in the area. When reviewing some of the most prominent and often cited works in the area there are number of objectives for studying business models that surfaces (Pateli & Giaglis, 2003a).

- *Understanding* the key elements and mechanisms in a specific business domain and their relationships.
- *Communicating* and sharing the understanding of a business model among business or technology stakeholders.
- *Specifying valid requirements* for the information systems that support the business model.
- Identifying options for *changing and improving* the current business model thus facilitating change.
- *Experimenting with innovative business concepts* to determine if current business models can be easily adapted to new concepts, as well as to assess the viability of new business initiatives. (ibid)

It was mentioned that researchers have proposed several definitions that explain the essence and purpose of a business model. One widely cited definition is the one provided by Timmers (1998) which stipulates a business model as: "*an architecture for the product, service and information flows, including a description of the various business actors and their roles; and a description of the potential benefits for the various actors; and description of the sources of revenues*".

This definition provides clear indications of the primary issues/elements to be examined while developing a business model: *actors and roles*; *product or service flows*, *revenues* and *benefits* to key participants.

Another conception of the business model is given by two other researchers, Osterwalder and Pigneur (2002), as they view it as the missing link between strategy and business processes. More specifically, they consider a business model as the "conceptual and architectural

implementation (blueprint) of a business strategy that represents the foundation for the implementation of business processes and information systems". They see the business model as: "*A description of the value a company offers to one or several segments of customers and the architecture of the firm and its network of partners for creating, marketing and delivering this value and relationship capital, in order to generate profitable and sustainable revenues streams"*. Other researchers that also emphasise the feature of "networks", or "business webs (b-webs)", which they claim will be prevalent in almost all future business models, are Tapscott *et al.* (2000). This is mainly due to the emergence of ICT applications that enable business networking in value chains and nets. Their approach is an example of how technology's evolution is changing the definition and conception of primary business constructs, such as the business model.

In summary, some researchers perceive the business model as a pure business concept that explains the logic of making business for a firm (e.g. Timmers, 1998), while some others consider it as a link between strategy, business processes, and information systems (e.g. Osterwalder & Pigneur, 2002). The difference between these two interpretations of business models concerns the relationship of the business model with the concepts of strategy, business processes, and technology. While in the first interpretation the three concepts are included in the description of a business model, the second interpretation considers them as inter-linked components set in different levels of a pyramid construct, as depicted in *Figure 2-5*. In this case, a business model is considered as the conceptual and architectural implementation (blueprint) of a business strategy and represents the foundation for the implementation of business processes and information systems.

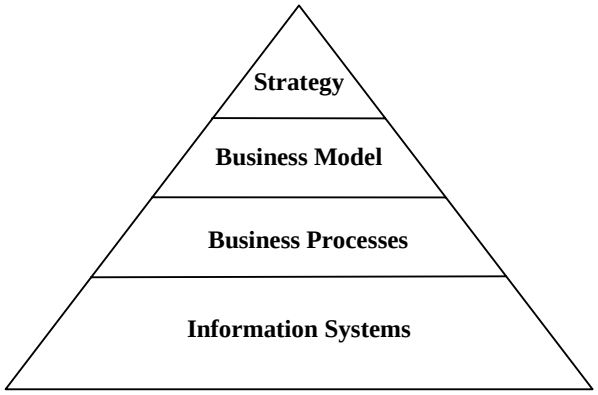

Figure 2-5, Business model definition framework (Source: Pateli & Giaglis, 2003a)

The above discussion has provided an introduction to the concept of the business model by reviewing some of the definitions given by earlier research. These definitions, however, do not provide guidelines for a business model evolution process. This is the subject for discussion in the next section.

2.4.1 Methodology for business model evolution

Pateli and Giaglis (2003b) have concluded that existing research work attempting to define a structured methodological approach for business model evolution is rather fragmented. They explain that most of the efforts made are only applicable under certain business circumstances, and that these efforts mostly provide a general framework rather than a stepwise methodology that can guide a business model evolution process. Therefore, from synthesising existing literature, Pateli and Giaglis have proposed a research methodology meant to fill this gap. *Figure 2-6* below illustrates the methodology that comprises three phases and six steps. In what follows the figure, these phases and steps will briefly be discussed.

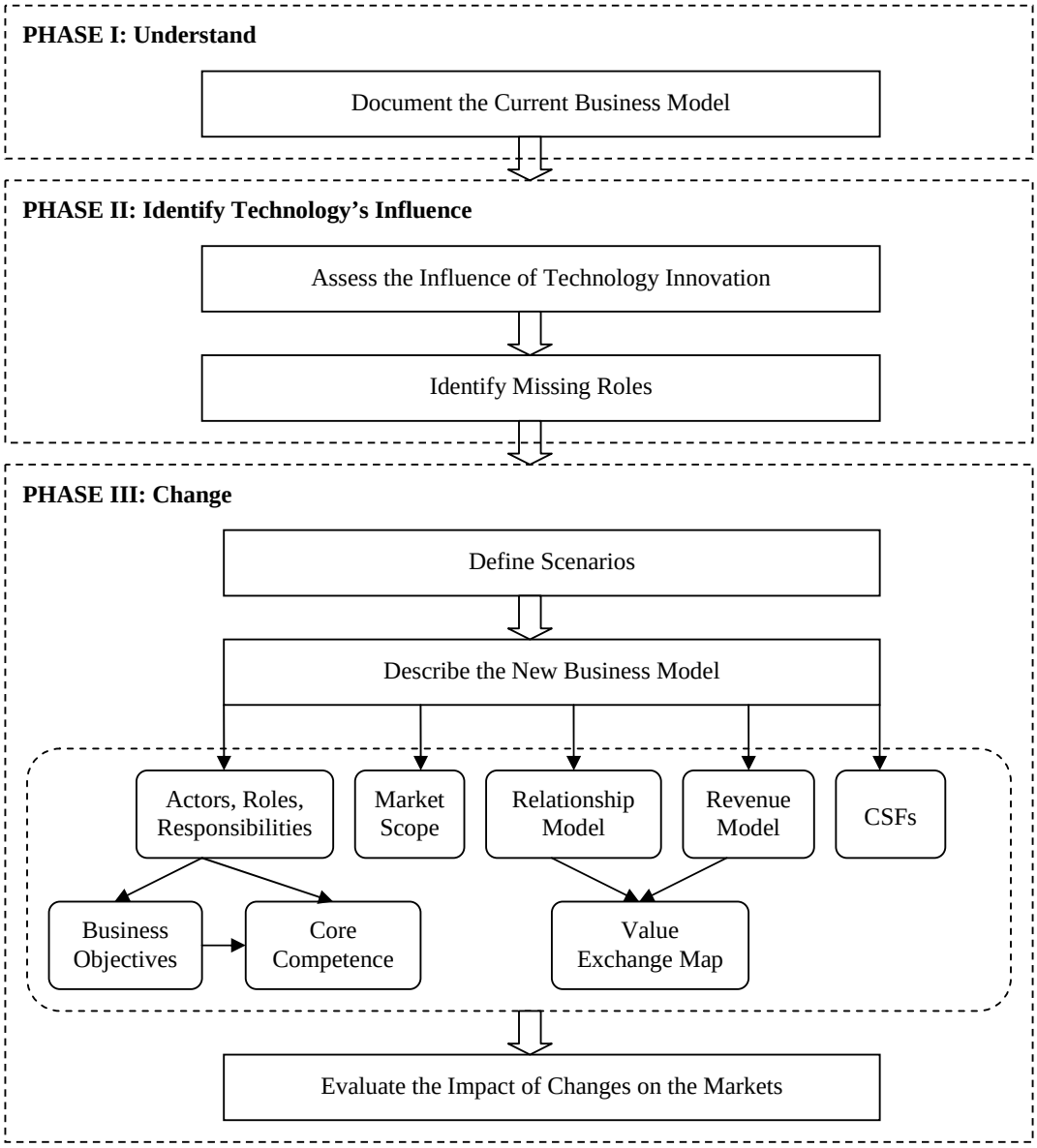

Figure 2-6, Methodology for business model evolution (Source: Pateli & Giaglis, 2003b)

Phase I: Understand

The mission of this phase is to delineate the current/reference business model in order to provide an in-depth understanding of the current business situation. This phase includes the following step:

Document the current business model

This initial step of the methodology includes depicting the current business environment with the aid of a business model analysis framework, e.g. that of Osterwalder and Pigneur (2002). Pateli and Giaglis (2003b) explain that this will render in a business model construct that can be used for *understanding* the key elements and mechanisms in a specific business setting and their relationships, *communicating* and sharing the understanding of the business among technology and business stakeholders, *specifying valid requirements* for the technology solution being developed, and identifying options for *changing and extending* the current business model.

Phase II: Identify the Technology's Influence

The concern of this phase is to assess the impact the new technology will have on the current business model. The anticipated result is the identification of possibilities for evolution or extension of the current business model. There are two steps included in this phase:

Assess the influence of technology innovation

This step includes an identification of the benefits that the technology solution will bring to the key players in the business model and also a specification of the changes imposed on the current business model's elements.

Identify missing roles

Included in this step is an identification of the requirement for one or more roles needed for performing new business functions, as well as a description of the activities and the functions of these roles.

Phase III: Change

This phase is concerned with the design and description of the future business models and ends at visualising the new business situation through the design of the transformed value chain and the new business models. The steps found in this phase are:

Define scenarios

After that the need for one or more roles has been identified and justified in the previous step, different scenarios can be defined, each of which proposes a different cooperation scheme and way of distributing responsibilities between new and existing players in the new business environment.

Describe the new business model(s)

Based on the scenarios identified, this step aims at describing one or more business models by indicating the value offered by each player in the future business model, and defining financial and communication flows among them (ibid). This includes determining the type of revenue model to be utilized. The revenue model lays-out the process by which a company actually makes money by specifying how it is going to charge (or, as will be described in the next section, subsidize in the case of advertising supported models) for the services provided. The business model lays out the strategy of how the company should position itself in the value chain and how it intends to sustain itself by creating value (ebstrategy.com, 2004). The revenue model, on the other hand, spells out the execution, that is how to convert the value into cash flow (ibid).

Evaluate the impact of changes on the market

In the concluding step of the methodology an assessment is made of the impact the transformed business model may have on the structure and dynamics of the concerned vertical and horisontal markets.

2.4.2 Different m-commerce business models

The introduction of m-commerce is changing the role of many players in the telecom value chain, and is also creating room for new entrants. In the complex web of business partners, all of which are seeking to position themselves in the value creation process, new business models are being invented. From conducting case studies in Japan, Devine and Holmqvist (2001) have identified six main business models that are utilised in m-commerce. They have denoted these the *user fee model*, the *shopping model*, the *marketing core business model*, the *improved efficiency model*, the *advertising model* and the *revenue-sharing model*. These are briefly described below.

The user fee model

The fundamental idea of this model is that users should be charged for the content they access. Payment is usually carried out through a third party, who collects the fees and forwards them to the content provider for a commission fee. For this model to be successful companies must offer content that users are willing to pay for.

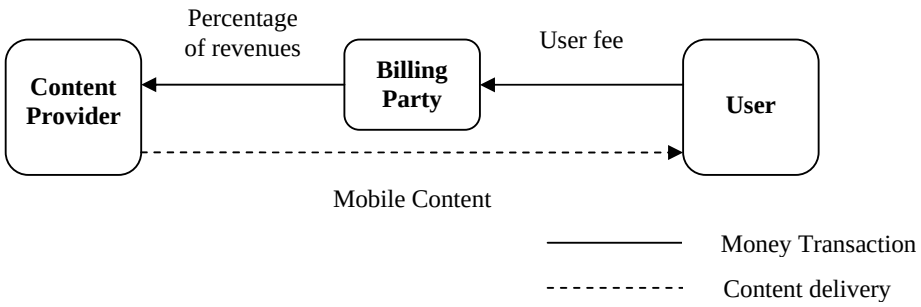

Figure 2-7, The user fee model (Source: Devine & Holmqvist, 2001)

Payment from user to content provider can be in the form of a subscription fee, on an actual-usage basis, or even a combination of both. Subscription fees are favourable in that they provide a more predictable source of income and they also tend to be easier to collect. Sadeh (2002) states that small content providers are required to form partnerships with a mobile operator, a mobile portal or some other type of third party micro-billing provider if they are to implement payment methods based on actual usage. To subscribe to content it is common that users enters the site and registers online.

User fees can be the primary source of income for a company, or just side revenue and not the main purpose for offering content over the mobile Internet.

The Shopping Model

The companies leveraging this business model all sell products or services over the mobile Internet, viewing it essentially as another distribution channel. These include both pure-players, that exclusively operates in the virtual realm, as well as those with a brick-and-mortar presence, operating in the both the physical and virtual realm.

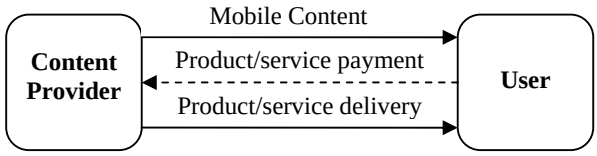

Figure 2-8, The shopping model (Source: Devine & Holmqvist, 2001)

This model is basically an extension of the one found on the wired Internet. The payment procedure also often involves a third party, not represented in *figure 2-8*, such as a credit card company, or mobile operator, that generally keeps a percentage of the transaction.

When it comes to shopping, the mobile Internet will probably face much of the same adversities that the fixed has been struggling with. Many of the products that are unsuitable for selling over the fixed Internet will be equally unsuitable for sale over the mobile Internet (Devine & Holmqvist, 2001). Tickets, reservations and other bookings are products that the user have no need of seeing prior to purchasing, and are therefore likely among the most popular categories of mobile e-tailing services.

The Marketing Business Model

Content providers can choose to utilise the mobile Internet for sole marketing purposes in order to promote their core businesses. When adopting such a model, the company creates a mobile presence just to attract customers to a traditional, or online, sales channel.

The key to mobile marketing is knowing your customer, and to leverage that knowledge in order to create highly relevant promotional messages. These should reflect customers' personal preferences as well as possibly their location or other contextual attributes (Sadeh, 2002).

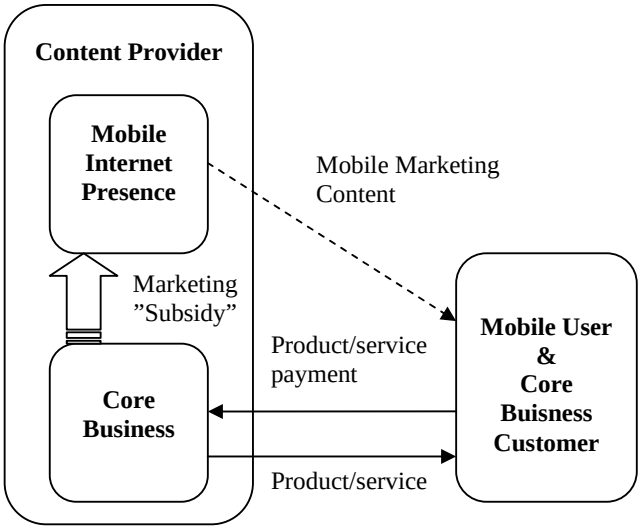

Figure 2-9, The marketing business model (Source: Devine & Holmqvist, 2001)

Location information is valuable for marketing purposes since it enables companies to send direct marketing at the right time, when the potential customer is in the right place. For the marketing company, it is of utmost importance that users are willing to accept promotional messages sent to their mobile device, e.g. in the form of information or discount coupons.

In order to protect users from unwanted marketing messages privacy laws and anti-spamming legislation has emerged. By adoption a permission marketing approach, companies are ensured that users do not perceive their marketing messages as intrusive. Through permission marketing information about the user is obtained, along with their consent to receive a certain number of notification messages each day. The initial contact with users often takes place on the fixed Internet, where they are asked to fill in personal details. This information is later used to send relevant promotional messages to their mobile devices (ibid).

The Improved Efficiency Model

As the name of this model implies, it is primarily used by companies that view the mobile Internet as a means to improve efficiency of their business. They see the mobile channel as an opportunity to reach the users more cost efficiently and to improve customer satisfaction. Mobile banking and mobile ticketing are examples where the introduction of a mobile channel can cut personnel costs, call centers, ticketing booths and counters, and hence improve efficiency.

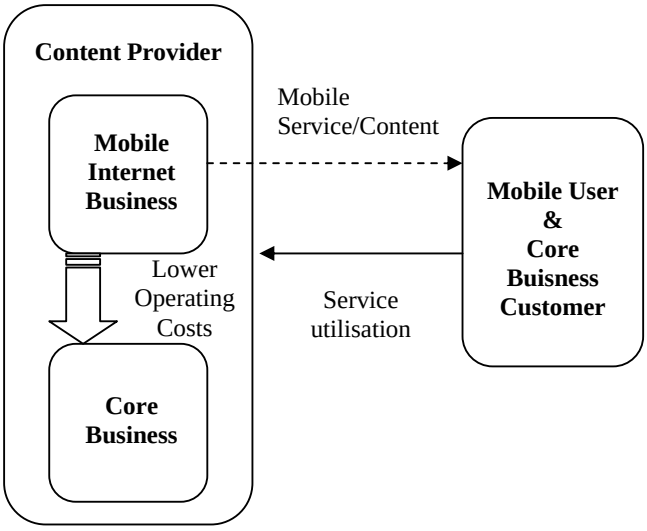

Figure 2-10, The improved efficiency model (Source: Devine & Holmqvist, 2001)

The improved efficiency model offers a win-win situation for both businesses as well as for end users. Businesses make gains in cost reductions, which hopefully propagate to the end users allowing them to lower their costs. Furthermore, the end users gain access to an additional channel with around-the-clock availability, increasing their convenience and sense of security.

The Advertisement Model

The advertising model has been around since the early days of the fixed Internet. It offers content providers the opportunity to generate extra revenue through their site by letting other companies expose their name or product information on it. In return for using the advertising space on the site, the advertising company pays a fee to the content provider (owner of the site). In practice there exist many variations of this model, many which involve intermediaries such as content aggregators, mobile portals, and mobile operators (Sadeh, 2002).

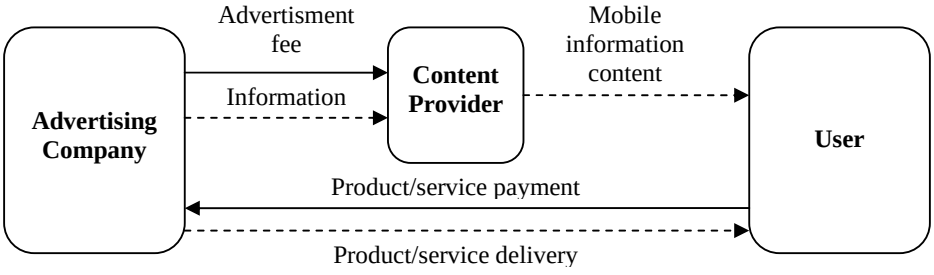

Figure 2-11, The advertisement model (Source: Devine & Holmqvist, 2001)

While there exist many hybrid models concerning what to base the advertisement fee on, three main methods of computing fees can be distinguished. These being flat fees, traffic-based fees, and performance-based fees.

The flat fee is the simplest form and involves charging the advertiser a flat fee in exchange for showing the ad for a certain period of time. Traffic-based fees enable advertisers to pay based on the number of times their promotional message is displayed, while the performance-based fee is determined by the number of times the ad has been clicked on by the users.

The Revenue-Sharing Model

Some content providers principally use content from other parties (content owners) on their sites. This partnership arrangement could be used in situations where owners of content do not find a standalone presence on the web sufficient, but when combining the content with that of others a compelling service can be given.

Depending on the specific content, the content provider either pays content owners for accessing their content, or alternatively gets paid for increasing content owners' visibility in the market (Devine & Holmqvist, 2001). As it may not always be obvious which of alternatives that is to be used, conflicts arise. The fact that both sides may feel like their role is devaluated constitute a significant barrier to the mobile Internet. Dixner *et al*. (2003) have commented this schism. In their case, in which the operators were content providers, they found that content owners saw it as the operators' responsibility to pay them for accessing their content. The operators, on the other hand, had the opinion that the content owners should be the ones paying for participating in the new channel.

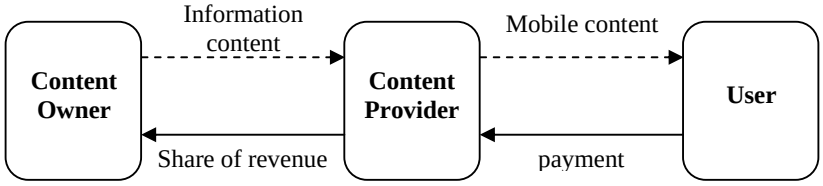

Figure 2-12, The revenue-sharing model (Source: Devine & Holmqvist, 2001)

The content providers applying this model obtain their content from sources outside of their own company. Companies adapting this role are for the most part content aggregators.

2.4.3 Different model constellations

The six main models described in previous sections are in no way exclusive, meaning they can be combined in different constellations to reach a solution that complies with specific situations. Some possible combinations suggested by Devine and Holmqvist (2001) are:

The User Fee Model

This particular model is favourable to combine with the Revenue Sharing and Advertisment Models. It is badly suited for situations where the provider wants to be visible and used by as many as possible. As users must value the content high enough to pay for it, this model does not combine well with the Shopping, the Improved Efficiency, the Marketing and part of the Advertisement Models.

The Shopping Model

This model is well suited to be combined with the marketing model as the whole purpose of marketing is to attract new, as well as existing, customers and thus increase sales. The Shopping Model can also be used as a means to improve efficiency. As customers reside to the mobile channel instead of traditional ones, resources required to maintain physical sales channels can be decreased.

The Revenue-Sharing Model

It was mentioned that this model often combines with the User Fee Model, since if the service is perceived as valuable enough, users will agree to pay for it. Also the Shopping Model can be used in combination with the Revenue-Sharing as many related kinds of content are aggregated to the same site. In the Advertising Model it is also quite possible for the content provider and the advertising company to share revenue.

2.5 Adoption of Information Technology (IT)

Many studies have addressed and provided insight to the factors that cause some people to adopt information technology (IT) while preventing others from doing so, e.g. Black *et al*., 2001; Featherman & Pavlou, 2003; Fillis *et al*., 2003; Lee *et al*., 2003. The classical Diffusion of Innovation theory by Rogers (1995) suggests that characteristics of innovations help to persuade potential adopters to embrace or reject an innovation and has often served as a basis for studies within this field. Rogers' framework declares five perceived attributes of an innovation that will affect the rate at which it is adopted in a social system. The five innovative attributes are relative advantage, compatibility, trialability, observability, and complexity. Relative advantage is concerned with the degree to which an innovation is perceived as being better than the products or services it is meant to replace, e.g. in terms of costs or convenience. The compatibility attribute represents the degree to which an innovation is perceived as consistent with past values, experiences and the needs of the potential adopter. An innovation that relates to users' past experiences in a positive and comfortable way is more likely to be adopted than an innovation that cannot be related to at all. The third innovative attribute of trialability refers to the degree an innovation can be tested prior to purchase. The observability attribute describes the extent to which an innovation is visible to potential adopters through other members of a social system. The more visible an innovation is the more likely it is to be adopted since its possible gains have already been recognised by potential adopters. Finally, the complexity attribute indicates the degree to which an innovation it perceived as relatively difficult to understand and use. Hence, it is negatively related to the adoption of an innovation. Another perceived innovation attribute that has been found to be important in the consumer decision-making process is the perception of risk associated with the purchase and use of a product or service (Lee *et al*., 2003). As with perceived complexity of an innovation, the perceived risk also has a negative correlation to the adoption process (Black *et al*., 2001). Perceived risk is commonly thought of as felt uncertainty regarding possible negative consequences of using a product or service (Featherman & Pavlou, 2003).

The Diffusion of Innovations theory has proved its value in explaining determinants for consumers' adoption of IT. However, Raymond (2001) reckons it needs to be enriched when innovations relate to complex technologies with an interorganisational locus of impact (e.g. when imposed by business partners), and when innovations are adopted by organisations (as opposed to being adopted autonomously by individuals). Other researchers have since completed work resulting in modifications to Rogers' original theory that provide numerous models that address IT adoption and usage within an organisation.

The technology acceptance model (TAM), initially put forth by Davis (1989), addresses IT adoption, implementation and diffusion in terms of perceived ease of use and perceived usefulness based on behavioural intentions (Harker & Van Akkeren, 2002). Belief about the system, perceived usefulness and perceived ease of use is posited by Agarwal and Prasad (1997) as directly affecting attitude to use. Further studies suggest that behaviour is a direct function of behavioural intention and perceived behavioural control that will impact on decision makers choosing to adopt an innovation (Taylor & Todd, 1995).

The constructs used in the above models are generally based around perceptions, beliefs, attitudes and intentions of the decision maker. More recent studies have identified other factors in addition to these that will have an impact on an owner/manager's decision to adopt new innovations, such as new mobile data technology. These include economic factors such as return on investment (ROI) and characteristics of the firm such as size, sector and status, and the structural sophistication of the firm. (Harker & Van Akkeren, 2002)

2.5.1 Adoption of IT/e-commerce by SMEs

Empirical studies have identified a number of factors thought to affect e-commerce/Internet technology adoption in small businesses, e.g. Iacovou *et al*., 1995; Thong & Yap, 1995; Harrison *et al*., 1997. From the factors identified in previous studies Van Akkeren and Cavaye (1999) have developed a model which explains the factors that facilitate or inhibit technology adoption in SMEs (*figure 2-13, depicted on page 34*).

The first category in this model encompasses owner/manager characteristics, based on behavioural and attitudinal factors. Research has shown that the CEO plays a significant role in the successful adoption of IT in small businesses. As they are in many cases the main decision-makers, their individual characteristics, attitude to IT, innovativeness, propensity to taking risks, and IT knowledge are powerful determinants of IT adoption (Harrisson *et al*., 1997). As a consequence of the important position of the owners/managers, their perception of benefits resulting from the adoption of IT constitutes a significant determinant. Section 2.5.2 elaborates on benefits and barriers of SMEs as a result of Internet adoption. Managers all have different views concerning along which lines of development they wish to see their business follow. While some are reluctant to change, as they see the risk and uncertainty outweighing possible benefits, others embrace it. A major potential for conflict is the type of development to be favoured in driving a business forward: in other words, the types of service or product development strategies to be favoured (Johne & Storey, 1998), for instance strategies that require IT adoption. According to Kelly and Storey (2000), firms can be one of four types in respect to their attitude towards new service development:

(1) *Prospector*. Values being "first" with new products, markets and technologies.

(2) *Analyser*. Seldom first to market, but frequently a fast follower with a more cost-efficient or innovative product.

(3) *Defender*. Locates and maintains a secure niche by protecting their position in a relatively stable product or service area.

(4) *Reactor*. Responds to product and market changes only when forced by environmental pressures.

Johne and Storey (1998) observe that most actors feel comfortable with conventional approaches, meaning that they play according to established rules of engagement. In this sense they are applying a "combative" maintenance service development strategy. The number of entrepreneurial actors, that invoke a service development strategy which involves breaking existing rules of combat, is far less. It is this type of rule-breaking is referred to as "new style service development". The aim of the new style service development is to exploit market potentials as fully as possible. It scrutinizes an existing market in order to see how it can be served better. Firms that truly have a proactive approach towards new service development may see it as an opportunity to "prepare for the future". The technical infrastructure for the development and production (hardware, software, and delivery system of a service) can provide a platform for other new services. Even though a new service may at first be seen as a failure, it can provide information of a market's particular requirements thereby allowing the company to spot further opportunities.

The second category in Van Akkeren and Cavaye's (1999) framework is concerned with the financial aspect of adopting innovations. Unlike larger organisations, that can afford to have a long-term perspective on an IT investment, SMEs are often in need of an immediate return on investment. SMEs often work with limited funding resources and need to see a significant return before they take a decision to engage in e-business. Decision making in SMEs tend to be short-term and intuitive, focusing on reaction rather than anticipation (Harrisson *et al*., 1997).

The third category is concerned with firm characteristics. According to Mehrtens *et al*. (2001) there are three aspects of organisational readiness: the level of IT knowledge among IT professionals in the organisation; the level of IT knowledge among non-IT professionals; and the level of IT use within the organisation. The available internal experiences and resources are well-documented factors affecting IT adoption (Jones & Tilly, 2003). Organisations with more IT experience or greater IT already in use are more likely to adopt IT. According to Duan *et al*., (2002) the lack of skills is perceived to be the most significant barrier to the uptake of IT among SMEs. Another factor found to influence the IT adoption of SMEs is that of external pressure. The pressure may be imposed by trading partners, customers or potential customers (Mehrtens *et al.*, 2001). Other factors such as the firm's structural sophistication, its size, sector and status have also been found to be influential. Also, the level of information intensity is considered a determinant for IT adoption.

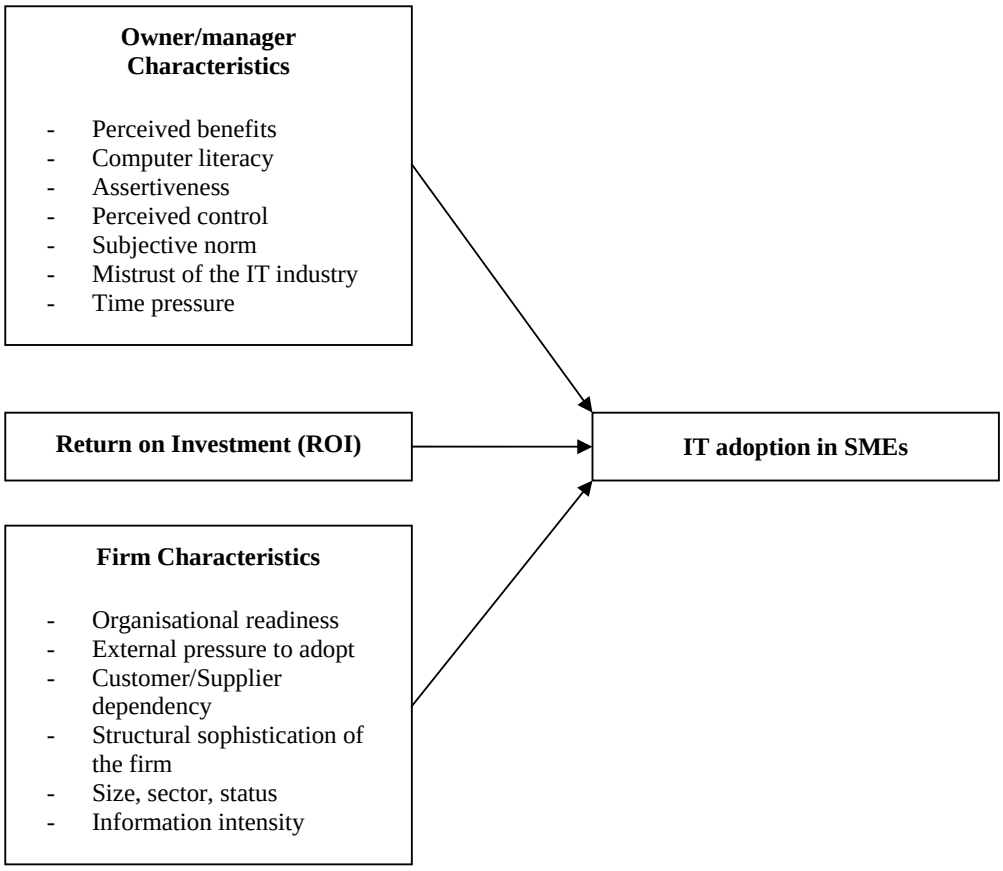

Figure 2-13, Framework of SME adoption of innovations (Source: Van Akkeren & Cavaye, 1999)

Other recent studies investigating SME rationales for adopting IT and e-commerce technologies have highlighted barriers and facilitators to adoption similar to the factors mentioned in Van Akkeren and Cavaye's (1999) model. Raymond (2001) offers one additional factor as he emphasises that among the organisational characteristics thought to influence the adoption of information technology, the firm' strategy plays a primary role. The adoption of an IT innovation is intertwined with the firm's business strategy, be it to reduce costs and reengineer business processes, to increase product/service differentiation, to achieve growth by developing new products/services and entering into new markets, or to develop strategic alliances. Furthermore, McGregor and Gomes (1999) suggest the existence of alliances/networks as a determinant influencing technology adoption by SMEs. The decision to adopt or not adopt IT will be influenced by the network within which the SME operates, particularly if time, cost and operational efficiencies can be realised. Fillis *et al*. (2003) touches on this when stating that by developing Internet based competencies, the firm can bypass traditional business barriers such as the physical distance between markets, and improve interaction between members of a network.

2.5.2 Internet benefits and barriers for small firms

In three empirical studies the benefits of the Internet for small firms are described (Abell & Limm, 1996; Poon & Strom, 1997; Poon & Swatman, 1997). By drawing inspiration from the components of business value as proposed by Bloch *et al.* (1996), Walczuch *et al*. (2000) have structured these benefits as illustrated in *table 2-1*.

Table 2-1, Internet benefits for small firms (Source: Walczuch et al., 2000)

Component	**Benefit**	**Source**
Product promotion	Direct and indirect advertising	Poon & Strom (1997)
New sales channel	Easy access to potential customers	Poon & Strom (1997)
	On-line sales and transactions	Poon & Strom (1997)
	Ability to reach out to international markets	Abell & Limm (1996)
	Increase in market share of products/services	Abell & Limm (1996)
Direct savings	Low cost communication	Poon & Strom (1997)
	Savings in communication costs	Poon & Swatman (1997)
	Savings in advertising costs	Poon & Swatman (1997)
	Increased productivity	Abell & Limm (1996)
	Lower cost margins for products/services	Abell & Limm (1996)
	Lower cost of obtaining supplies	Abell & Limm (1996)
Time to market	Product delivery	Poon & Strom (1997)
Customer service	Greater customer satisfaction	Abell & Limm (1996)
Brand image	Company image enhancement	Poon & Strom (1997)
	Create an up-to-date corporate image	Poon & Swatman (1997)
Technological and organisational learning	Obtain know-how through discussion with others on the Internet	Poon & Swatman (1997)
Customer relations	Form and extend business networks	Poon & Swatman (1997)
New business models	Competitor's performance benchmarking	Poon & Strom (1997)
	Create new business opportunities	Poon & Swatman (1997)
	Speedy and timely access to information from web sites	Poon & Swatman (1997)
	Communication efficiency improvment	Poon & Swatman (1997)
	Effectiveness in information gathering	Abell & Limm (1996)
	Availability of expertise regardless of location	Abell & Limm (1996)
	Better service and support from suppliers	Abell & Limm (1996)

The empirical results of the three studies show that not all of the benefits listed in *table 2-1* are perceived as being equally important. It was indicated that direct and indirect advertising, low cost communication, and easy access to potential customers are the most important ones. Among the benefits considered the least important were competitor's performance benchmarking, inter-office documents exchange, and access to government and trade organisation data. (Walczuch *et al*., 2000)

There are also two market research studies that have focused on barriers for small businesses (Abell & Limm, 1996; Purao & Campbell, 1998). Both of these revealed issues that deter small companies from gaining Internet access. According to the study by Purao and Campbell (1998) primary barriers seem to concern start up costs, unfamiliarity with the web and lack of guidance about how to start the process (Walczuch *et al*., 2000). Abell and Limm's (1996) study also revealed that fear of not reaching a critical mass among business partners

constituted a barrier. In addition, both these studies highlighted security concerns as impeding the adoption of the Internet (Walczuch *et al*., 2000).

Riemenschneider's *et al*. (2003) study of IT adoption decisions in small businesses concluded that financial assets constituted the largest barrier for making investments. The second biggest obstacle found was that staff needs to be trained in order to get them "up to speed". Among the most identified consequences were cost reductions in other areas of the business, cost of developing the web presence, employee time to maintain the web presence, better promotion of products and services, and image improvement within the industry.

Another study on small firms' Internet commerce issues by Poon and Swatman (1999) classifies perceived benefits in categories of direct and indirect benefits. The difference between these two categories is that the direct benefits can be quantifiable by means of such techniques as financial data, numbers of new customers, or other quantitative evidence, whereas the indirect benefits, on the other hand, are not easily quantifiable but have a position effect on the business (e.g. customer goodwill). The two categories can be further broken down into short- and long-term benefits; the short-term benefits being realised within a few months while the long-term benefits may take longer and be unpredictable. A few of the potential benefits identified by Poon and Swatman (1999) in each category respectively are illustrated in *figure 2-14*.

	Short-term	Long-term
Direct benefits	**Examples:** - Save in communcation costs - Generate short-term revenue	**Examples:** - Secure returning customers - Long-term business relationships
Indirect benefits	**Examples:** - Potential business opportunities - Advertising and marketing	**Examples:** - Ongoing business transformation - New business initiatives

Figure 2-14, Framework of benefits in the context of small business Internet commerce (Source: Poon & Swatman, 1999)

The Electronic-commerce Business Impacts Project (EBIP) initiated by the OECD has presented another study investigating drivers of electronic commerce adoption (Desruelle & Burgelman, 2001). Although this study does not explicitly focus on SMEs, it does not exclude them either. It has identified three categories of factors that drive companies, independently of their economic sector, to adopt e-commerce. The first category are the external drivers, over which firms have no direct control, as they are part of the general business environment. The second category is firms' motivations that originate from within the firms and are often, but

not always, reactions to external drivers. The third category involves the factors that act as obstacles or incentives to e-commerce implementation. Using the EBIP as reference, Desruelle and Burgelman (2001) identify the following sets of drivers within each category:

1. *External drivers*:

· globalisation and trade liberalization;
· competitive pressures;
· technological inclusion or exclusion;
· virtual reduction of physical distance;
· "hype"

2. *Firms' motivations*:

· reduce costs;
· increase speed and internal coordination;
· increase coordination of the value chain;
· develop and improve external collaboration;
· create interdependency (to lock in, to be locked in);
· create more added value;
· better manage relations with customers;
· develop competitive advantage.

3. *Obstacles/incentives to implementation*:

· investment factors;
· technical factors;
· organisational factors;
· network(ing) factors.

2.6 Research Problem and Research Questions

In the introduction chapter, the initial research area was put forth as "*how can the introduction of new mobile data technology enhance the value creation process of actors in the tourism industry in Norrbotten"*. The literature review has highlighted certain interesting parts of this research area that are worthy of further elaboration. For instance, by looking at current practices within the field of mobile data technology in tourism, it was revealed that many (e.g. CRUPMET, LoL@, m-ToGuide) recognise the idea of a mobile tourist guide as a future attractive service. The mobile tourist guide can in many ways be regarded as a mobile portal, which solely offers tourism related information. As a consequence of this, the scope of the research area will be narrowed down to specifically focus on how value can be created for tourists through a mobile tourist guide. The value creation process for mobile data technology, such as a mobile tourist guide, was described by Andersen (2002) in what was denoted the mobile content value map. The value map described the roles that need to be performed in order to deliver mobile content to end users. It was stated that since no actor alone is able to create a complete end-to-end solution, by adopting all roles in the value map, partnerships need to be formed. Thus, in order for attractive mobile data services, such as a mobile tourist guide, to be developed, content providers, users, and operators must cooperate with each other (Dixner *et al*., 2003). However, at this point in time, few, if anyone, know how this cooperation will evolve; how the value map will crystallise.

The discussion above allows for a more precise research problem to be defined within the initial research area. The research problem of this thesis has consequently been stated as:

RP: *How can the content value map for a mobile tourist guide in Norrbotten be characterised?*

Pateli and Giaglis (2003a) stated that one objective for studying business models is to assess the viability of new business initiatives when experimenting with innovative business concepts. Since a mobile tourist guide should exceedingly be considered as an innovative business concept, the assessment of its viability for implementation yield motive for studying a future business model. Both Timmers' (1998) and Osterwald and Pigneur's (2002) definitions of a business model emphasised the description of the various business actors and their roles, or in other words, the value map.

In order to answer the research problem, that is still of rather extensive nature, it is necessary to formulate a few supporting research questions. These explain in more detail what is being studied. Upon inspection, one can see similarity between the stated research problem and the fourth step in the Pateli and Giaglis (2003b) methodology for business model evolution. It is therefore logical that the research questions draw inspiration from the preceding two phases of this methodology. Another reason for leveraging this methodology is that Pateli and Giaglis (2003b) have proved its usefulness in the case of a mobile exhibition guide, which in many

ways is similar to the mobile tourist guide examined in this particular study. The research questions have been formulated as:

***RQ1**: How can the structure of the tourism industry in Norrbotten in the context of a mobile tourist guide be described?*

***RQ2**: How can enablers and barriers for adopting roles in a future value map for a mobile tourist guide in Norrbotten be characterised?*

The first research question has been formulated in accordance with the methodology's initial step and is concerned with getting an understanding of the current business scene. The second research question relates to the second step in the Pateli and Gialgis' (2003) methodology, which addresses the influence of the technology innovation. This research question aims to identify enablers and barriers that encourage or prevent actors from positioning themselves in the value map. The third step in the methodology (identify missing roles) does not have to be considered since the mobile content value map has already predefined the roles that needs to be adopted.

'The ideal engineer is a composite ... He is not a scientist, he is not a mathematician, he is not a sociologist or a writer; but he may use the knowledge and techniques of any or all of these disciplines in solving engineering problems.'

- N.W. Dougherty

Chapter 3 – Theoretical Frame of Reference

This chapter essentially aims to provide an understanding of the main things being scrutinised in this study. Initially this process requires that concepts covered by the research questions be defined, so that a calibration of what the research questions intend to investigate is given. The research questions will then, metaphorically speaking, filter the reviewed literature and extract the relevant theories that will assist in providing their answers. This will render in the emergence of this study's frame of reference, which later will constitute the base for collecting and analysing the empirical data.

3.1 Concept Definition of the Research Questions

According to Miles and Huberman (1994), a conceptual framework, or frame of reference, explains either graphically or in narrative form, the main things being studied. The authors state that the conceptual framework should be based upon the research questions. In the previous chapter this study's research questions were stated as:

- "*How can the structure of the tourism industry in Norrbotten in the context of a mobile tourist guide be described?*; and

- "*How can enablers and barriers for adopting roles in a future value map for a mobile tourist guide in Norrbotten be characterised?*".

In order to answer these research questions, it is required that inherent concepts first are defined. In this process, notions that are somewhat fuzzy and imprecise are elucidated. In the case of the aforementioned research questions, there are a few notions that need to be clarified in order to explain what they denote in the context of this particular study. For instance, the literature stated that the tourism industry is a vast concept with no clear-cut boundary. As a consequence, it is necessary to elaborate on this concept and define its scope more precisely. The two subsequent sections elaborate on each of the two research questions.

3.1.1 The structure of the tourism industry in Norrbotten: research question one

It was previously mentioned that this research question corresponds to the first phase of the methodology proposed by Pateli and Giaglis (2003b) and aims to provide an understanding of the current business environment. This environment was in the literature on tourism described

as comprised of different types of complementary and competing organisations, multiple sectors, infrastructure and an array of public/private linkages that create a diverse and highly fragmented supply structure. The tourism industry's structural view, described by Werther and Klein (1999), provides a comprehensive overview of the different types of actors that are residing in this industry. In the context of a mobile tourist guide, however, not all of these roles are significant to study. As is evident from *figure 2-2*, the tourism industry is an industry that consists of networks. Network theory suggests that the more central position an organisation has, the more important it is to the network's coordination functions (Pavlovich, 2003). As a mobile tourist guide in many ways can be regarded as a mobile portal, which exclusively offers a variety of tourism related content, its management puts great emphasis on coordination. It is therefore relevant to identify actors possessing central roles on the supply-side in the tourism industry network as these should be the most inclined to adopt roles in the mobile content value map for a mobile tourist guide. The most central actors described by Werther and Klein (1999) are the destination marketing organisations, such as regional tourist organisations (RTOs) and local tourist organisations (LTOs). Thus, it is of interest for this study to identify RTOs and LTOs residing in the tourism industry in Norrbotten along with a description of their current roles and of the activities they perform.

Telecommunication operators are not part of the tourism industry per se, however, since they have the billing relationship with the end users they are fundamental actors in the process of delivering content to mobile devices. Their willingness to occupy one or several positions in the value map will have an impact on how a future business model for a mobile tourist guide can be constructed. Consequently, mobile telecommunication operators must also be identified.

3.1.2 Enablers/barriers for adopting a value map position: research question two

This research question basically corresponds with the second phase in the Pateli and Giaglis (2003b) methodology that aims to identify the influence of introducing new technology. In the literature review it was stated that this includes an identification of the potential benefits (enablers) that the technology solution may bring to the key players, identified in research question one, in the future business model. This research extends this step to also encompass an assessment of the potential barriers that may hinder these players from adopting roles in the value map. The term enabler is hence defined as *anything that encourages an actor to adopt a specific role in the mobile content value map*. Similarly, a barrier is defined as *anything that prevents an actor from adopting a specific role in the mobile content value map*.

The objective of this research question is consequently to investigate concerns and motivations of the players, identified in research question one, for adopting roles in the value map, in respect to a mobile tourist guide. The literature on IT adoption pointed out common enablers and barriers, some of which were SME specific, that influence decision making concerning investments in new information technology. Theory has stressed the importance of SME owner/manager's individual opinions when it comes to making decisions on IT investments. Furthermore, Pateli and Giaglis (2003b) stated that the position a firm desires in the architecture of the business model, i.e. the value map, is dependent on its business objective and inherent core competencies. As a consequence, SMEs owner/manager's personal perception of IT as well as the firm's business objective and core competencies

should initially be assessed as these are of an overarching nature and will have an effect on the perceived enablers and barriers.

Enablers and barriers towards IT adoption that were highlighted in the literature have been summarised in *table 3-1* and *3-2* respectively.

Table 3-1, Enablers for IT adoption

Enabler	**Source**
Generate revenue	Poon & Swatman (1999)
Cost reductions - communication cost - advertising cost - better targeted promotional messages	Riemenschneider *et al*. (2003) Poon & Strom (1997) Poon & Swatman (1997)
Greater customer satisfaction	Abell & Limm (1996); Riemenschneider *et al*. (2003)
Short ROI	Harker & Van Akkeren (2002)
Organisational readiness - high IT level of use within organisation - internal experience	Harker & Van Akkeren (2002); Jones & Tilley (2003)
Product delivery/Time to market	Poon & Strom (1997)
Effectiveness in information gathering	Abell & Limm (1996)
Easy access to potential customers	Poon & Strom (1997)
High level of information intensity	Harker & Van Akkeren (2002)
Company image enhancement	Poon & Strom (1997); Riemenschneider *et al*. (2003)
Improve interaction between members of a network	Desruelle & Burgelman (2001); Fillis *et al.* (2003)
Form and extend business networks	Poon & Swatman (1997)
External pressure to adopt	Harker & Van Akkeren (2002)
Virtual reduction of physical distance	Desruelle & Burgelman (2001)
Keep pace with competition	Riemenschneider *et al*. (2003)
Prepare for the future	Johne & Storey (1998)

Table 3-2, Barriers for IT adoption

Barrier	**Source**
Costs (start-up costs)	Purao & Campbell (1998); Duan *et al*. (2002);
Lack of guidance about how to start the process	Ambell & Limm (1996)
Critical mass among business partners (customers are not online)	Purao & Campbell (1998)
Financial assets	Riemenschneider *et al*. (2003)
Long ROI	Harker & Van Akkeren (2002)
Organisational readiness - low IT level of use within organisation - lack of skills	Jones & Tilley, 2003; Harker & Van Akkeren, (1999); Duan *et al*. (2002)
Require training staff/learning effort	Riemenschneider *et al*. (2003)
Employee time to maintain web presence	Riemenschneider *et al*. (2003)
Firm's structural sophistication	Harrison *et al*. (1997)
Low level of information intensity	Harker & Van Akkeren (2002)
Security hazards	Abell & Limm (1996); Purao & Campell (1998)

The third step of the Pateli and Giaglis (2003b) methodology, which is also encompassed in the second phase, is concerned with identifying missing roles. The roles that need to be adopted in order to realise a mobile tourist guide have already been predefined by the mobile content value map described by Andersen (2002). Although all roles are crucial for the development of a mobile tourist guide, not all of them are of interest for this particular study, as some are more of a facilitating nature than others. For instance, it is imperative that network equipment and devices are sophisticated enough to offer the bandwidth and internal capacity respectively required to support a mobile tourist guide if it is to be user-friendly and achieve diffusion among users, however, the actors performing these roles will not be the driving forces for this type of application. The traffic transport, application development and technical service provision roles have on similar grounds also been excluded from this study, and consequently, the roles that will be scrutinised are commercial service provision, content aggregation and content provision. The area of focus within the mobile content value map has been marked out in *figure 3-1*.

3.2 The Emerged Frame of Reference

In summary, the emerged frame of reference of this study, depicted in *figure 3-1*, uses constructs from the methodology of business model evolution by Pateli and Giaglis (2003b) in combination with elements from the mobile content value map described by Andersen (2002).

Initially, the tourism industry is described in accordance with how it was defined in section 3.1.1. This includes identifying actors (RTOs, LTOs and telecom operators) their current roles and activities. Thereafter, enablers and barriers for these actors to adopt the commercial service provider, content aggregator and content provision roles need to be assessed. The knowledge of various actors' concerns and motivations for adopting different roles in the value map is valuable and useful in the creation of a future business model.

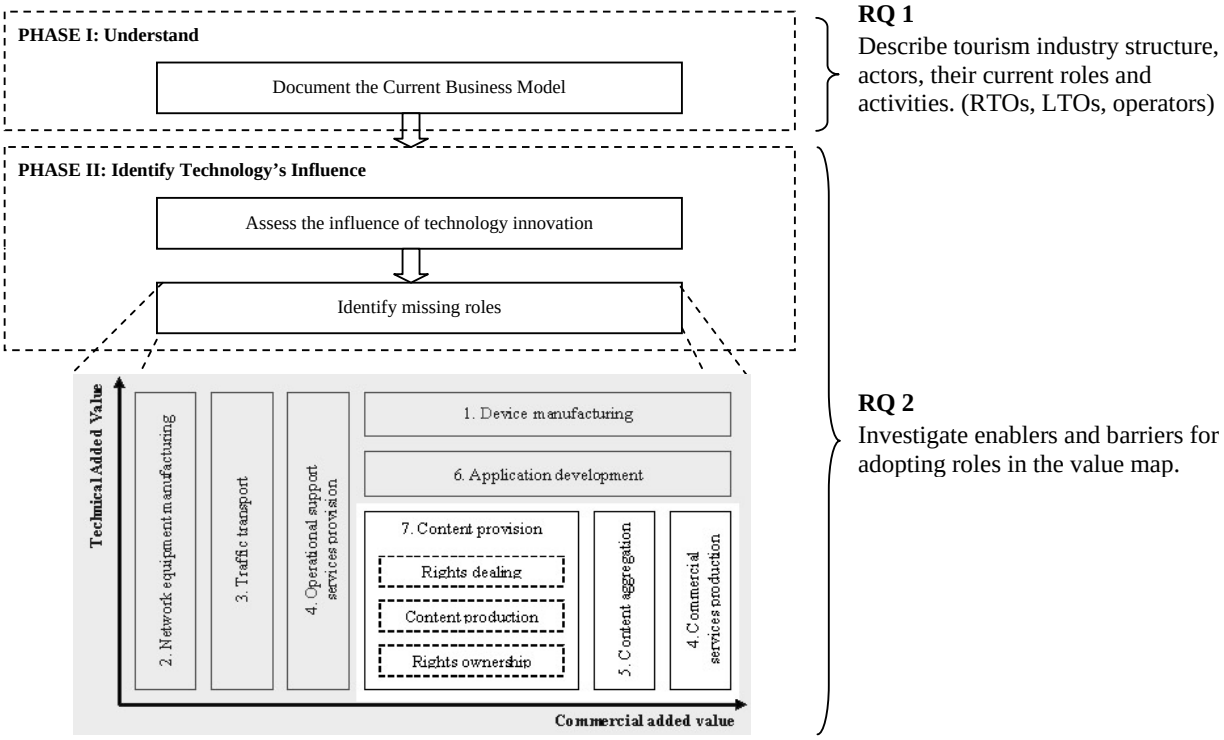

Figure 3-1, The emerged frame of reference of this study

'*What we have to do is to be forever curiously testing new opinions and courting new impressions.'*

- Walter Pater

Chapter 4 – Methodology

A method is a tool that can be leveraged to help solve problems and obtain new knowledge (Holme and Solvang, 1997). This chapter presents the procedure of the research; describing the purpose of the research, its approach, the sample selection, the data and data collection as well as discussing the efforts made in order to ensure the quality of this study.

4.1 Research Purpose

All research purpose formulations can be categorised as being exploratory, descriptive or explanatory. In practise, the purpose is a determination of the research problem that describes the direction and objectives of the research. (Christensen *et al*., 1998)

An exploratory research is according to Eriksson and Wiedersheim-Paul (1997) useful when the problem area is difficult to limit, the perception of which model to use is diffuse and it is unclear what characteristics and relations that are important. In an exploratory study it is common to use many different sources to gather as much information about a specific subject as possible. Wallén (1996) states that an exploratory research is a suitable approach when the researcher is uncertain of the theories that are relevant, and when important characteristics and relations are difficult to determine.

In instances when a problem is clearly structured and when the intention of the study is not to conduct research about factors' related causes and symptoms it is appropriate to conduct descriptive research (Eriksson and Wiedersheim-Paul 1997). The researcher conducting the descriptive study possesses good knowledge of a market problem or market situation but lacks an updated, clear picture of its status (Christensen *et al*., 1997). Thus, instead of describing new phenomena that affect a certain area, the descriptive research focuses on describing it.

Most explanatory research seeks casual relationships between independent and dependent variables. By changing the value of the independent variable it is possible to study fluctuations in the value of the dependent variable. Thus, in order to conduct an explanatory research one must in advance know which independent variables assert influence on the dependent variable. (Christensen *et al*., 1998)

It has been stated that the aim of this research is to investigate how a future value map can be characterised for a mobile tourist guide in Norrbotten. This research area is to a large extent unexplored, and given the newness of the technology involved it is not surprising that a search of the literature has provided limited results. Harker and Van Akkeren (2002) have concluded that most of the literature on the adoption and marketing of mobile data technologies is not

empirically based and is limited to discussing the technologies in terms of their application to business, rather than adoption barriers or marketing strategies. Consequently, as it has not been evidently clear which theories to apply on the research area, this research have been conducted in an exploratory manner. Although the research will contain some descriptive elements, for instance research question one, the main research purpose of this thesis is of an exploratory nature.

4.2 Research Approach

The approach of any type of research is basically a result of how the researcher chooses to manage two dimensions; the analytical- and time dimension. The analytical dimension is concerned with the width and depth of the research and affects the number of studied variables, the size of the sample, and the extent to which the result can be generalised. The correlation between the research's width and depth is not in any way fixed, but merely describes two underlying dimensions: wide-narrow and deep-shallow. The former dimension indicates the number of cases being studied; the wider the study, the more cases are taken into consideration. The concern of the latter dimension is the number of variables being studied. A greater number of variables are scrutinised in a deep research than in a shallow one. Most market researches are either wide and shallow or narrow and deep. (Christensen *et al*., 1998)

As research that is wide and shallow studies few variables among a large number of cases it aims to comment on characteristics of the population as a whole. This type of research is often of quantitative nature as the results are based on numbers and statistics and are presented in figures. On the other hand, research that is narrow and deep focuses on a few cases which characteristics are studied thoroughly. The concern of this type of research is to obtain a complete understanding and overview of a problem, or situation, and as such extract data that is of qualitative nature. Characteristics of qualitative studies are to a large extent based on the researcher's own description, emotions and reactions (Yin, 1994). It was previously stated that the scope of the research is not solely determined by the analytical dimension but also by the time dimension which can be divided into two antipoles. The research problem can either be studied over time in order to create a dynamic view of reality, or at a certain point in time, which instead provides a picture of how reality appears in that specific moment (Christensen *et al*., 1998).

Christensen *et al*. (1998) distinguish between four types of approaches that differ in respect to the aforementioned dimensions (depicted in *figure 4-1*). These are cross-sectional-, case-study-, longitudinal-, and experimental approach.

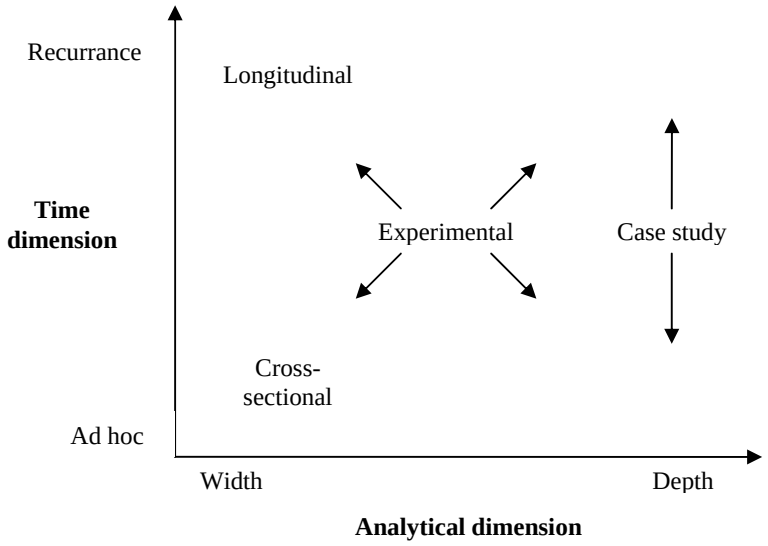

Figure 4-1, Different types of research approaches (Source:Christensen et al., 1998)

According to Yin (1994), case studies are the preferred strategy when "how" or "why" questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context. Christensen *et al.* (1998) claim that there are no definite rules restricting how to conduct a case study or how to collect data. It is common that several data collection procedures are used. This lack of structure is a prerequisite for the ability of the case study to thoroughly investigate a problem; however, it is also its biggest drawback. As there are no given rules the researcher must obey, it is easy to make mistakes or jump to false conclusions. Zikmund (2000) concurs and explains that researchers must be flexible and attempt to glean information and insights wherever they find them. This implies that the success of any case study is highly dependent on the alertness, creativity, intelligence, and motivation of the researcher. As a consequence, the results from case analysis should be seen as tentative (ibid).

Yin (1994) states that a case study can involve a single or a multiple case study. A single case study makes an in depth investigation regarding only one organization or decision. When two or more organizations are investigated, it is called a multiple case study, which gives the opportunity to compare studies in a cross-case analysis, so that a higher level of understanding can be reached (ibid.) According to Eriksson and Wiedersheim-Paul (1997) the risk when conducting a multiple case study is that each case might be less in depth investigated. Yin (1994) further states that evidence from a multiple case study is often considered as more compelling than evidence from a single case study, and therefore the multiple case study is looked upon as more robust.

It was in the previous section mentioned that the purpose of this study is exploratory with the objective of identifying and investigating potential candidates' concerns and motivations for adopting a role in the mobile content value map. This implies that the analytical dimension be narrow and deep. Therefore, given the nature of the stated research problem it has been concluded that the most favourable approach would be to perform a number of case studies.

4.3 Sample Selection

It is possible to choose a sample in various ways. According to Zikmund (2000) the major alternative sampling plans may be grouped into probability techniques and nonprobability techniques. Probability sampling is characterised by each member of the population having a known nonzero probability of selection. In nonprobability sampling, on the other hand, the units of the sample are selected on the basis of personal judgement or convenience. As the selection of elements in this particular study cannot be based on a chance selection procedure, but needs to be selected in a non-random manner, a nonprobability technique will be used.

Zikmund (2000) states that there are three nonprobability sampling techniques; convenience sampling, quota sampling and snowball sampling. As the name suggests, convenience sampling selects the units, or people, that are most conveniently available. The purpose of quota sampling is to ensure that certain characteristics of a population sample will be represented to the exact extent the investigator's desire. The third technique, snowball sampling, is a procedure in which initial respondents are selected by probability methods, and then additional respondents are obtained from the information given by the initial respondents.

The technique that has been used in this study is snowball sampling. The initial step of this study was concerned with delineating the structure of the tourism industry in Norrbotten, in order to identify RTOs and LTOs residing in this industry. As it is not possible to get a clear, exhaustive view of the industry from the outside it was found necessary that an actor participating in the network assisted in this process. Sweden's official website for tourism and travel information (visit-sweden.com) provided a link to the regional tourist organisation Norrbotten/Lappland that, due to its central network position, was able to provide a holistic view of this industry's structure. The contacts to the mobile telecom operators included in the sample were given by the principals.

4.4 Data

Data can be classified on the basis of its form and also on the basis of how it is obtained. The former case distinguishes between quantitative and qualitative data while the latter categorises data in terms of primary- and secondary data.

4.4.1 Quantitative and qualitative data

Research that is of quantitative nature mainly registers numbers and focuses on quantities and frequencies of quantifiable things – variables – that can be statistically analysed. The analysis focuses on discovering, determining, and measuring the correlation between different variables. A quantitative research is structured and has predefined hypotheses that it wishes to consolidate or falsify. It has an atomic view, which means that it only studies parts of an entirety. (Christensen *et al*., 1998)

The distinguishing feature of qualitative data is that it is presented in words, text, symbols and actions. A qualitative study aims to gain an understanding of a certain phenomenon's holistic view rather than merely understanding its separate parts. Studies that are of qualitative nature

generate conceptual descriptions of reality in text and models, which aims to illustrate connections that have emerged. Qualitative data is used to construct theories, theoretical hypotheses or practical working hypotheses. (ibid)

4.4.2 Primary and secondary data

There are two general types of marketing data – primary and secondary. Primary data are collected for the first time specifically for the needs of the present study, whereas secondary data are already published data that has been collected for other purposes than for the needs at hand. Secondary data can be classified as being internal or external depending on its original source. The former being available within the organisation, e.g. sales forecasts and product specifications, while the latter originates outside of the organisation. Government publications, trade association data, books, bulletins, articles and reports are examples of secondary external data. (Kinnear & Taylor, 1996)

Savings in cost and time are key advantages of using secondary data compared to primary data. The major disadvantages of secondary data relate to the extent that the data fit the information needs of the research, its accuracy and its timeliness. The data fit problem implies that since secondary data have been collected for a purpose other than for the current research, it rarely complies with the information needs of the project at hand. When addressing the accuracy problem of secondary data, the researcher should assess the source, the purpose of the publication, and secure evidence concerning quality. Regarding the timeliness aspect of secondary data, it is important that the researcher bears in mind that secondary data that have been collected a long time ago may have lost its relevance, and therefore its use should be questioned. (ibid)

4.4.3 Use of data in this thesis

Generally, a research requires more information than what is accessible in terms of secondary data; this study offers no exception. The research problem has stated that the concern of this study is to investigate how the value map can be characterised for a mobile tourist guide in Norrbotten. It was also mentioned that this implies investigating concerns and motivations for actors to adopt certain roles in the value map. Since no previous study has investigated this matter, at least not in this particular regional setting, this research relies almost exclusively on primary data. The collected data is mostly qualitative and the result of the research is presented in text and not numbers.

4.5 Data Collection

According to Kinnear and Taylor (1996), there are two principal methods of obtaining data from respondents - communication and observation. Communication requires the respondent to actively provide data through verbal response, while observation requires the recording of the respondent’s passive behaviour. As the observation technique does not comply with the purpose of this research it will not be subject for further discussion

4.5.1 The communication method

The data collection methods used in communicating with respondents are personal interviews, telephone interviews, and mail questionnaires. The main advantage of the personal interview is its versatility, meaning it has an ability to collect data on a wide range of information needs. On the other hand, the main limitations of the method are the respondent's unwillingness or inability to provide data, and the risk of the questioning process having a negative influence. For instance, the respondents may bias their responses in order to give a socially acceptable answer or to please the interviewer. (Kinnear & Taylor, 1996)

According to Holme and Solvang (1997) interviews are ideal when in-depth information is preferred and that it allows flexibility and closeness to the respondents, which is important when conducting qualitative studies. An interview is a two-way conversation which gives the interviewer the possibility to actively participate in the interview (Yin, 1994). The fastest way to collect data is usually through telephone interviews. The time spent on travelling when conducting personal interviews makes this method slower, and the speed of mail questionnaires is difficult to influence (ibid). However, personal interviews have an advantage over telephone interviews in that they give the interviewer the confidence of face-to-face interactions (Eriksson & Wiedersheim-Paul, 1997). Some advantages and disadvantages of personal interviews are listed in *table 4-1* below.

Table 4-1, Advantages and disadvantages of personal interviews (Source: Christensen et al., 1998)

Advantages	Disadvantages
Is fairly easy to accomplish (time wise)	High cost
Increased control of the interview situation	Risk that interviewer has an affect
Complicated questions can be asked	Not suitable for delicate questions
Suitable for questions that require knowledge	Often a small number of respondents
Material can be shown	Requires well-trained interviewers
Resulting questions can be asked	Often complicated data analysis

The very newness of the technology investigated in this thesis presents certain problems in the research design. For example, how can people understand and discuss technology that is still in its development stage? How can people be expected to gauge their opinions if they cannot not conceptualise the technology? It was found necessary to demonstrate the technology in some way, and not merely to describe it as it would have been insufficient and, as Stokes (2000) warned, common meaning would have been difficult to achieve. This was the main motivation for conducting personal interviews with the RTOs and LTOs. In order to address the challenge, during each of the personal interviews an Ericsson P800, with the mini-browser Opera installed, was used to access the website of the interviewee's organization. Although the P800 is not a 3G terminal, and the data was accessed over GPRS technology, it allowed the respondent to get a better understanding of future mobile data technology. Furthermore, pictures illustrating the interfaces of the CRUMPET and Mobile Tourismo projects were used in order to give a concrete form of how a future mobile tourist guide could be presented.

The interviews with the operator and mobile application development firm Mobile Tourismo were conducted over the telephone. This method was found suitable as demonstration of technology was not an issue for these actors. Furthermore, since none of these actors are located in Luleå telephone interviews were the fastest way to collect the data.

Yin (1994) explains that interviews may take several forms. He distinguishes between case study interviews that are of open-ended nature, that are focused, or follow the lines of a formal survey. In the open-ended interview, the interviewer does not follow any structured questions. This allows the respondent to provide both facts and personal opinions regarding a certain matter. In a focused interview, the respondent is interviewed in a short period of time. The focused interview can remain open-ended; however, the respondent is more likely to follow a certain set of questions derived form the case study protocol. The third strategy is more structured, along the lines of a formal study.

The interviews were conducted using a focused, or semi-structured (Hussey & Hussey, 1997), approach, i.e. the interview guide functioned as a list of questions to ask; however, the order in which the questions were asked varied between the interviews depending on the respondent's answer. The questions were open-ended in order to give the respondent the opportunity to freely elaborate on their answers. Additional questions were asked whenever the given answers were not enough comprehensive.

4.6 Quality of the Research

It is important that research is reliable and trustworthy in order for results and conclusions to be usable. There are four aspects of quality that need to be maximized in any case study design: construct validity, internal validity, external validity and reliability (Yin, 1994). These four aspects are discussed in the two subsequent sections.

4.6.1 Reliability

The reliability concept demonstrates that the procedures of a study – such as the data collection procedures can be repeated, with the same results (ibid). Christensen *et al.* (1998) state that there are two features of qualitative research that may influence the reliability. Firstly, qualitative data are obtained through interacting with other persons in a certain context. Since reality is changeable, it is impossible to gather identical data that can be measured. Secondly, the researcher functions as both the qualitative analyst as well as the measuring instrument, in contrast to quantitative research that is based on statistical methods. Christensen *et al.* (1998) further claim that as the reliability is coupled to the researcher, and since reality is changeable, neither the researcher nor anybody else can repeat the study and obtain the exact same result of the research. Therefore, according to them, the traditional reliability concept is irrelevant for determining the value of a qualitative analysis. However, there are other criteria connected to the validity concept that can be used for this purpose.

4.6.2 Validity

The validity concept involves the degree to which the researcher has succeeded in measuring what was initially indented to be measured. Yin (1994) recognises three aspects of validity, construct-, internal- and external validity and define them as:

- Construct validity - establishes a correct operational measure for the concepts being studied.
- Internal validity - establishes a causal relationship whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships.
- External validity - establishes the domain to which a study's findings can be made general.

There are three tactics available to increase construct validity. The first is the use of multiple sources of evidence during data collection; the second is to establish a chain of evidence also during data collection, and the third to have key informants reviewing the draft case study report. (ibid)

Internal validity is a concern only for causal (or explanatory) case studies, in which an investigator is trying to determine whether one event leads to another. If the investigator concludes that there exist a causal relationship between two events without knowing that there exist a third factor that have caused the relationship, then the research design has failed to eliminate threats to internal validity. It should be noted that this logic is inapplicable to exploratory and descriptive research purposes since these are not concerned with making causal statements. (ibid)

The third element of validity – external validity – seeks to explain whether a study's findings can be made general beyond the immediate case study (ibid). For instance, in the case of a mobile tourist guide in Norrbotten, are the results obtained also applicable to other regions? Problems of external validity generally relate to the possibility that a specific but limited set of experimental conditions may not deal with the interactions of untested variables in the real world (Zikmund, 2000). Thus, if a study lacks external validity, it will be difficult to repeat the experiment if different subjects, settings, or time intervals are used.

4.6.3 Sources of errors

In order to increase the credibility of any research potential errors must systematically be analysed. It should be assessed if there are potential errors in the problem analysis, the sample selection, the data collection, the handling of data and in the interpretation of data (Christensen *et al.*, 1998). *Table 4-2* highlights some potential errors and consequences in the aforementioned stages.

Table 4-2, Potential errors and their resulting consequences (Source: Adapted from Christensen et al., 1998)

Stage	**Potential errors**	**Consequences**
Problem analysis	Erroneous demarcation of the research problem	The stated research problem is not investigated
Selection of organisations	Incorrect sample selection	Important respondents have been omitted Over- and under coverage leads to incorrect conclusions
Data collection	Interviewer effects, Instrument errors, respondents inability or reluctance to answer	Wrong data are collected
Data handling	Incorrect data handling, e.g. typing errors	Errors in data
Data interpretation	Drawing incorrect conclusions	Inaccurate results of the study

4.6.4 The quality of this thesis

Although Christensen *et al*. (1998) have a dubious attitude towards the importance of reliability in a qualitative study, I find it worth mentioning that I regard the reliability in this thesis to be high. In order to avoid errors in the collection and handling of data, the obtained answers were written out as soon as possible after the interviews. After that the data collected from the interviews had been compiled, it was e-mailed to the respondents for approval. This allowed the respondents to edit their answers in case they felt misquoted, and also ensured that the answers had been interpreted correctly leading to a higher degree of reliability.

There might be interviewer effects, as the interviewer always affects the respondent in some way. It cannot be excluded that respondents may have given answers that are not fully truthful, but somewhat distorted due to their belief of what the interviewer wants to hear. I strove to ask questions in a similar manner in order to avoid influencing the respondents.

The validity I also consider to be high. The problem discussion and the interview template were revised together with the supervisor at LTU in order to increase the construct validity.

'The beginning of knowledge is the discovery of something we do not understand.'

- Frank Herbert

Chapter 5 – Presentation of Empirical Data

It was explained in the methodology chapter that a snowball sampling technique has been applied in this thesis since the actors whom to interview are not known in advance. As a consequence of this choice of sampling procedure, this chapter consists of two parts. The first part deals with the identification of organisations that may have an interest to position themselves in the value map of a mobile tourist guide. It was previously stated that regional- and local tourist organisations are likely to have a role to play in the value map due to their central roles in the network. Furthermore, as operators are the ones having the billing relationship with users, their opinion and motives for adopting roles in the value map should also be assessed. The second part of this chapter discloses the data that was obtained during the interviews.

5.1 Part 1 – Identification of Organisations

5.1.1 Regional- and local tourist organisations in Norrbotten

The best approach to delineate the structure of the tourism industry in Norrbotten has been deemed to identify and interview one central actor in the industry that can give an accurate view of its characteristics and thereby point out suitable organisations to interview further. This sampling technique was in the methodology chapter described as snowball sampling.

Sweden's official website for tourism and travel information (visit-sweden.com) has been the starting point for the empirical study of this thesis. From this website, which is administrated by the Swedish travel and tourism council, a link was provided to the regional tourist organisation (RTO) in Norrbotten called Norrbotten/Lappland. On its website, Norrbotten/Lappland describes its primary mission as being a contributor to the development and growth of the tourism industry in this region. The organisation aims to achieve its mission through building networks, coordinating resources and making other vigorous efforts. In its capacity of having the primary coordination function of the tourism industry in this region, it should constitute a valuable source of information in providing a holistic view of this industry's structure. Therefore, an interview was conducted with a project coordinator at Norrbotten/Lappland.

The coordinator informs that Norrbotten/Lappland is a regional umbrella organisation with the main objective to develop and promote the tourism industry in the region. The organisation is an economic association; a corporation form that promotes the economical

interests of its members, meaning it should help lowering their costs or increase their revenue. Members are tourism entrepreneurs, tourist organisations, municipalities, authorities, trade and other businesses, more or less anybody that will benefit from an increase in the number of tourists visiting this region. The coordinator informs that all destinations in the region are represented in the economic association, and that many entrepreneurs are either directly or indirectly members. She explains that it is hard to offhand give an accurate percent wise estimate of the span of the organisation.

It has been recognised that in order to increase the region's attractiveness and competitiveness it is important that all the organisations residing in the industry "stand together" and "pull in the same direction". As a response to this call to arms, Norrbotten/Lappland has initiated the KRAFT-process Up2Us (see graffman.se for more information), a development process meant to create a common vision and profile for the entire region, as well as for individual destinations. The manager explains that it is not enough to attract tourists to visit this region; they must also be well attended for the whole duration of their stay. The tourists make no distinction between different destinations and tourism entrepreneurs; if one actor under-perform, their whole stay can be ruined. Therefore, the manager stresses, it is crucial that all tourism entrepreneurs, and also the local population, are aware of the importance of hosting.

The region has been divided in eight different destinations, in which the Up2Us-process is implemented on a local basis. The destinations are Kiruna/Gällivare, Eastern Norrbotten (Tornedalen/Haparanda/Kalix), Jokkmokk, Arvidsjaur/Arjeplog, Luleå, Boden, Piteå and Älvsbyn. These have all formulated their own vision and profile; some have even defined their target markets. The near markets, Mälardalen, northern Norway and European countries such as England, France, Germany and Italy are viewed as interesting markets. The destinations are in different stages of the Up2Us-process, some have come further than others. At present there are only two destinations that already have well-functioning local tourist organisations established; these are Boden and Kiruna, but Piteå has also come quite a bit in its development process, according to the manager. In the destination Luleå, the seat for the provincial government, the goal is to have an established local tourist organisation by the end of year 2005.

Besides Norrbotten/Lappland, there is only one other regional tourist organisation in Norrbotten – Hushållningssällskapet, which also is a member of Norrbotten/Lappland economic association.

Against this background on the structure of the tourism industry in Norrbotten, the tourist organisations that have been selected for interviews are the two regional tourist organisations Norrbotten/Lappland and Hushållningssällskapet, and also the three local tourist organisations in destination Boden, Kiruna and Piteå. The motivation for choosing these three destinations is that since they have come furthest in building their organisation respectively, they should presently be in the best position to adopt mobile data technology. Upon contact, both destination developer managers in Luleå and Eastern Norrbotten confirmed that, as they are currently in the process of building an organisation, there is currently no one who has mandate to answer questions regarding investments in mobile data technology.

5.1.2 Mobile telecommunication operators

The Swedish National Post and Telecom Agency (PTS) decided on December 16 year 2000 to award Europolitan, Hi3G, Orange and Tele2 the four 3G licences in Sweden. Together these operators committed they would cover at least 8 860 000 people by the end of 2003, which today corresponds to 99,98% of the total population in Sweden (PTS, 2002). It has later become quite evident that this initial statement was too optimistic.

There have been a few changes occurring since the licences initially were distributed. Europolitan have changed name and are now operating under the brand Vodafone; Hi3G has also changed their name and are now know as 3; and Orange have sold their licence to Telia Sonera and Tele2. The current holders of the Swedish 3G licences are thus the four operators Telia Sonera, Tele2, 3 and Vodafone.

Due to time constraints an assessment was made that it was not necessary to gauge the opinions of all of these operators, and therefore the initial sample selection constituted of two operators. However, as the answers given in the first interview led me to believe that all operators may have a similar attitude towards which roles to adopt in respect to a mobile tourist guide, in combination with the other operator showing reluctance to schedule in an interview appointment, only one operator was interviewed.

5.1.3 Application service provider

The literature overview covered some European projects that have been conducted with aim to create user-friendly mobile tourist guides. All of the identified projects were foreign and therefore it was believed that no Swedish counterpart existed. However, it was later revealed that there is a Swedish company in Karlskrona – Mobile Tourismo – that specifically focuses on developing mobile tourist guides and other mobile data solutions for the tourism industry. As it is of interest to see where in the value map an application service provider, such as Mobile Tourismo, would like to position itself, an interview was conducted with one of the managers at this company.

5.2 Part 2 – Interviews

5.2.1 Mobile telecommunication operator

The person interviewed in this company has the title “content enabling manager”. She informs that when providers want to distribute their content via the mobile networks, these are charged for accessing the operators’ networks and also the operators’ invoicing systems. In some cases content providers are charged for the opportunity to present their content on the operator’s marketplace and gain access to its customer base. As the interviewed manager sees how a mobile tourist guide needs to be operator independent the latter alternative is probably not an option. She explains that content providers that want to provide operator independent services must enter into contracts with each of the operators. The operator always charges the user for the amount of downloaded data. In addition to this they offer payment options, such as premium-SMS and premium-MMS, which make it possible for content providers to charge users for accessing their content. It is not the operator that administrates the payment via

premium-SMS or premium-MMS. This task is always performed by a third external actor that determines the amount users must pay to access the content, and also the period of time which users have access to the content. Examples of such actors are CELLUS and Mobilnet.

The manager informs that they have realised that users are interested in paying per event and not for the amount of sent and received data. Their ambition is to find "flat rate" business models that allow content providers to include/cover the amount of data in their price. This will probably be achieved earliest in a few years time. Operators have had a negative attitude towards flat rate business models in that they do not generate enough revenue.

In the case of a mobile tourist guide, the manager sees a problem in charging tourists who have subscriptions with foreign operators. She explains that the operator has well-functioning roaming agreements with foreign operators in respect to mobile voice calls and surfing on the Internet. However, as of now, no satisfactory solution exists for premium-SMS and premium-MMS. She informs that there might be some sort of credit card- or micro payment solution that in the future can over bridge this problem. It is vital that a simple and functional payment solution is in place in order to offer a mobile tourist guide to foreign tourists.

5.2.2 Mobile Tourismo

Mobile Tourismo is a Swedish company which has specialised in developing mobile data services for the tourism industry. Their service solutions are meant to assist tourist organisations in the marketing of regions and destinations by enhancing tourists' experience while on location. Their main product is a mobile tourist guide that on maps displays the users position (based on GPS technology) along with POIs (points of interest), which are presented in forms of web pages and flash animations. The company has in 2003 performed mobile tourist guide trials in Ronneby Brunnspark and the world heritage site in Karlskrona. The evaluations of these trials have concluded that tourists appreciate this type of service, and that they perceive it as adding value to their experience.

The development manager interviewed at Mobile Tourismo, informs that there are two different options how the mobile tourist guide application can be delivered to end users. The information is either stored centrally on their server platform and delivered to the user's mobile terminal over the mobile network, or downloaded directly to the mobile terminal without having to access the mobile network; which of the two alternatives to be utilised depends on the amount of data the mobile tourist guide encompasses. The advantage of the former over the latter is that the application is not restricted to the terminal's internal capabilities, and thus it allows users to consult far much richer media content. The disadvantage of this solution is that it becomes more expensive as mobile operators must be compensated for the access to their networks.

There are different options regarding payment models. One possible scenario, pointed out by the manager, is that the user sends a premium-SMS to an operator-independent number. The operator independency is a necessity since all tourists must be able to access the mobile tourist guide regardless of the operator with whom they have a subscription. The price of the SMS, which has been determined by Mobile Tourimo, is deducted from the user's mobile phone bill and a revenue-sharing agreement between the operators and Mobile Tourismo

regulates how the generated revenue is divided. The user receives a password, in return for the SMS, that can be used to access the mobile tourist guide residing on Mobile Tourismo's server. The period of validity for the password (i.e. the period of time the user has access to the system) can also be set so that it ranges in accordance with the price of the SMS. Some tourists may only want to access the tourist guide for one day, others one week and a third category two weeks.

In the above scenario the user constitutes the primary source of revenue. The manager points out that there may also exist other alternative revenue sources. For instance, tourist organisations may be inclined to pay for the provision of a mobile tourist guide if it enables them to benefit from cost reductions, for instance in printed material or physical guides. It is also quite possible that these two revenue sources (tourists and tourism organisations) can be combined in such a way that both parties perceive the trade-off between costs and benefits outweighing in favour of the latter.

As the mobile tourist guide is hosted on Mobile Tourismo's server platform the customers (tourist organisations) are not required to invest in any hardware. The customers are provided with a web interface to the program which allows them to edit maps and information without first having to consult Mobile Tourismo. The manager believes this is the most favourable solution for the customers; however, if customers wish to host the application themselves it can be arranged. The price of the mobile tourist guide solution depends on a set of parameters, for instance the number of information points (data stored on their web server) and the number of users (traffic).

Mobile Tourismo recognises that tourism organisations generally have little financial means to invest in new technological solutions, and that these are often not considered a primary priority. In order to sustain their operations, they are in need of a large user base. Mobile Tourismo sees itself merely as a technical subcontractor, and as such has no interest in exposing its brand towards end users. Its primary concern is to increase awareness of its mobile solutions among tourist organisations, and to strengthen its reputation through reference projects.

According to the manager it is likely that the development trend is towards mobile data services that are a combination between their's and CRUMPET's mobile tourist guides, possibly with integrated MMS marketing tools, WIP's My Album (that allow tourists to via their mobile phone upload pictures onto a website) and also other services. He further inform that they are considering to add a "treasure hunt" feature to their tourist guide, which hopefully will entice tourists by allowing them to win prizes if visiting certain POIs.

5.2.3 Norrbotten/Lappland

Norrbotten/Lappland only employs two people, of which the interviewed manager is responsible for making decisions concerning investments in IT that is to be used internally within the organisation. As the organisation is an economic association it is "owned" by its members. Therefore, it cannot make IT investments of the magnitude that a regional mobile tourist guide implies without having support from its members.

The manager admits to not being technical and well-informed about 3G. He does not personally use his mobile phone's GPRS function to send and receive e-mails as he perceives it as slow and cumbersome. At the time of the interview, the manager demonstrated that when trying to connect to his mobile operator's portal, the information was displayed in Norwegian instead of Swedish. In spite of this mishap, the manager assures having confidence in the technological development of mobile data services.

About the organisation and region

It was previously stated that Norrbotten/Lappland is a regional tourist organisation with the primary objective of increasing the number of foreign and domestic visitors to this region. The interviewed manager explain that the organisation has a coordination function meant to support and serve members in areas where these do not have time or resources themselves. This involves for instance negotiating prices for advertisements in industry magazines (by buying a large advertising space Norrbotten/Lappland can offer its members lower prices) and arranging monters at national and international exhibitions. The manager informs that Norrbotten/Lappland acts as a "contact surface" between national tourism organisations and members, informing members about trends and statistics of different markets. This also includes technological trends, such as new IT solutions. The organisation also manages the process of distributing information that arise internally among members, meaning it functions more or less as a hub, which listens to members' concerns and interests and mediates contacts between members that share similar interests.

There is a clear distinction regarding roles and responsibilities between Norrbotten/Lappland and the local tourist organisations. Norrbotten/Lappland operates on a strategical level with marketing activities that are of an overarching nature, whereas the individual destinations are responsible for product development, making investments, competence development and communicating with their targeted markets. Norrbotten/Lappland does not have any information of its own that it wishes to convey to tourists. All the information found in its "destination brochure" is more or less a compilation of the information provided by the destinations. The manager explains that the further away tourists are the more important it is to cooperate, especially for destinations that lack a core attraction like the Ice Hotel.

The manager explains that since "Norrbotten/Lappland, or the region itself, does not have a product to sell, it is imperative that the tourists are brought down to the local destination level as quickly as possible where the products are". He further informs that "it is the destinations that serve the tourists with information as they arrive upon location. There has not been a single tourist that has contacted us after that they have arrived in Norrbotten". He also states that there is no need to expose the brand Norrbotten/Lappland after that the tourists have arrived to the region. The brand Norrbotten/Lappland is just a common name for all the destinations, and as such, it is better that the destination brands receive more exposure.

The core competence of the organisation lies according to the manager within the fields of marketing and lobbying. The latter activity involves for instance persuading organisations to schedule wilderness exhibitions in this region.

Statistics show that there has been an increase in the number of tourists visiting this region since this new organisation was established and its Internet portal launched. However, the

manager does not dare to make a statement whether this increase is a consequence of the region's new approach or the result of more general trends. Statistics show that approximately 7,9 million tourists visited Norrbotten in 2003, of which about 25% were foreign, and the majority of these Norwegian.

Current use of IT

The organisation is responsible for operating the region's Internet portal. This is not performed in-house but has been outsourced to a technical service provider as the organisation itself does not have the necessary technical competence. The purpose of the Internet portal is to create a common stage for all tourist organisations residing in this region. By collecting and concentrating all relevant tourism information in one place a win-win situation is created for tourists as well as tourist organisations. As most of the tourism organisations are small enterprises, and as such do not have much financial resources to spend on marketing, the portal provides them with a means to increase their visibility in the market. Tourists benefit from the portal as they no longer have to engage in a tedious information search, but are able to "one-stop-shop". The Internet portal was in 2003 awarded with the Swedish publishing prize. The Swedish Travel and Tourism Council views it as an ideal example in the branding strategy of Sweden.

There exists no formal strategy regarding IT development, and IT is not viewed as something that would be image enhancing. The manager informs that they view IT purely a means to become more efficient and effective in performing their activities. For instance, information dissemination has been facilitated by an intranet that members can access through the Internet portal. Another example that demonstrates how the organisation applies "modern methods" is they way in which a current survey on tourists' attitudes is undertaken. This survey is not carried out in a traditional style using paper. Instead, handheld computers have been distributed to 100 accommodation facilities in the region of Norrbotten and Lapland that tourists will use when participating in the survey.

When asked about the organisation's attitude towards new service development the manager identified it as being an analyser. As an illustrative example he informs that efforts are currently being made to convince members that a region wide information system (destination management system) should be implemented. The introduction of a destination management system will help increase efficiency by reducing the redundancy of information that currently exists. At present, the same information is stored in several different databases which means it must be updated more than once. The destination management system also makes information more available so that the different destinations can access each others' information. The manager informs that before such an information system can be implemented there are still many issues to resolve. Convincing municipalities to change current practices and introduce new procedures and routines is a difficult and time-consuming process. The manager perceives it as extremely important that there is an increase in the flow of information between the destinations so that they are brought closer to each other, allowing them to access each other's information and hence give better service to visitors.

Perceived barriers and enablers for mobile data technology

If there is consensus among the destinations that a regional mobile tourist guide is a future attractive service, Norrbotten/Lappland is ready to step in as the commercial service provider. If say, there are only two out of the eight destinations that is enticed by the idea, and wishes to pursue it, then Norrbotten/Lappland will only mediate contacts between the interested parties so these can form a collaboration project. Norrbotten/Lappland does not have any content of its own that it would like to convey to tourist, its role is more or less just to act as a first contact. This could for instance be providing an embracing welcome as the tourists log on to the tourist guide "Welcome to Norrbotten/Lappland, we hope you will enjoy your stay". Updating the information would need to be managed by the destinations.

The most obvious barrier that would impede the realisation of a region-wide mobile tourist guide is lack of financial means. Money is always an issue, the manager explains. As many tourism entrepreneurs are already under the impression that the 2000 SEK/year fee for exposing their products on the fixed Internet portal is too high, it would be difficult to convince them to contribute financially. The reason for their discontent is that they are not aware of the effect of their "investment"; they do not see the direct results. If the mobile tourist guide could provide a qualitative measure for their return on investment it stands a much higher chance of succeeding. The manager says it is imperative that the cost of implementing the mobile tourist guide equals or exceeds the expectations of perceived usefulness. According to the manager, the destinations will have to account for the biggest part of the investment a regional mobile tourist guide would imply, since it is primarily their area of responsibility. Norrbotten/Lappland would not contribute financially, but could assist in raising funds.

Norrbotten/Lappland is responsible for conducting analyses and producing statistical reports that can be used as support for decision making by the destinations. Therefore, if a mobile tourist guide (or another type of mobile data service) could be used to collect accurate statistical information on tourists' behaviour it would be a valuable tool. Also, the ability for visitors to give online feedback would be a desired feature.

The manager perceives uncertainty in the number of tourists that he believe would be interested in utilising a mobile tourist guide. He explains that many of the foreign tourists that visit Norrbotten are enticed by the exotic nature, the tranquillity, the adventure, and snow and cold. Tourists that are pursuing this experience are looking for genuineness, and may therefore perceive a mobile tourist guide as being too commercial. Thus, a mobile tourist guide may not be compatible with the purpose of their trip.

Different types of tourists have different needs in respect to not just the purpose of their visit, but also depending on how rigorously they have made arrangements prior to departure. One determinant that could possibly affect their interest is whether they have planned their trip themselves or used a travel agency for this purpose. Leisure travellers will normally sit down with their families and friends and plan out their desired activities while at a specific location, unless they are part of an organised escorted tour, but even then there are some value to the concept of a mobile tourist guide. It has been noted that tourists from Norway, Finland, Denmark and Holland generally travel without making prior arrangements, whereas tourists

from more distant markets, such as Germany, England, France, Italy, and the small but expanding markets Russia and Japan, often turn to travel agencies for arranging their trips.

The manager also holds the security aspect as important. Tourists want to have coverage everywhere in case accidents occur. If the coverage is not sufficient enough, mobile data services may lose their attractiveness. From personal experience the manager points out that when travelling from Töre to Gällivare for instance, large distances are outside the coverage area of mobile telecommunication networks.

The manager expresses scepticism in that a mobile tourist guide could come to replace traditional printed brochures. He personally believes that the feature of sending digital discount coupons to tourists is what primary suppliers will find enticing. Even if a mobile tourist guide could replace brochures to a certain extent, the manager stresses that Norrbotten/Lappland would probably not benefit from any cost reductions in printed material as most of their material is for pre-visit consumption and not for during the stay.

The manager also identifies another regional tourist organisation – Hushållningssällskapet – as a potential candidate for commercialising their "excursion guide", which is currently sold on the Internet portal of Norrbotten/Lappland. In a concluding remark the manager states "new technology is interesting, but it has to work".

5.2.4 Hushållningssällskapet

The manager that was interviewed declared having quite an interest in technology. She has previous experience from using a laptop to access her e-mail account, and has also used mobile data services to a certain extent. Her opinion is that mobile data services still needs to be improved so that they offer distinct benefits and are user-friendly.

About the organisation

The interviewed manager explains that it is wrong to view the organisation as a regional tourism organisation. Instead it should be seen as a regional based knowledge organisation which offers advisory services to, and carries out development projects for, small rural companies. They have expertise within a number of areas, two of which are tourism for rural areas and fishing tourism. The target group of the organisation are small enterprises that do not have more than 5 employees as these often have scarce resources to spend on marketing. The organisation has a lot of funds invested in real estates and forests. The surplus generated from these investments is used as financial support in development projects.

The organisation was founded by government authorities in 1814 with the missionary purpose of supporting local agronomy and subsidiary industries. This tradition still lives on, and the manager portrays the organisation as a modern "Robin Hood". The organisation's method of working is guided based on need, meaning that whenever it gets involved in a project it is because a need has been identified. In some instances the organisation also steps in as a co-financier. However, public funds cannot be used to support one company, it is important that a whole group of companies or associations benefit from their contribution. The manager informs that the organisation has no underlying financial interests in projects it chooses to be

involved in as “there cannot be interests of making profits when public funds are involved”. The goal is to create projects that can survive on its own.

The manager explains that, due to its historical background, the organisation is very broad and has its own type of organisational form. It cannot be categorised along the lines of any other type of organisation. It is privately owned but can sometimes be part of the public sphere as well. Its core competence within the tourism area lies within the fields of marketing and business economics.

All decisions regarding investments, that require greater financial means, are decided upon by the executive committee, in which the interviewed manager is a representative. The manager identifies the organisation as being a defender in respect to its attitude towards introducing IT in the organisation, i.e. it locates and maintains a secure niche by protecting their position in a relatively stable product or service area. She believes that one reason for this is that many of the employees are older and do not embrace new technology the same way as younger generations do. The age-structure in the organisation implies there is a “threshold” towards implementing new technology and introducing new working procedures.

Current use of IT

In addition to mobile telephones and desktop PCs, the manager believes that IT could be used more within the organisation than what is currently the case. They have discussed investing in equipment for video conferencing since it would reduce the travelling expenses (both time and costs) of personnel. As Norrbotten is such a vast geographical area, it could lead to significant savings. The website is administrated in-house by a webmaster, who is also responsible for the internal information distribution and the external marketing. There is also another person who has responsibility for the management of servers.

Perceived barriers and enablers for mobile data technology

Hushållingssällskapet has developed a regional “excursion guide” which contains information and directions to a large number of rural excursion destinations in Norrbotten. This is an established product that, roughly estimated, sells somewhere in the range 20 000 to 30 000 copies for every two year period that the same edition is used. The manager does not want to disclose the cost of developing and printing the excursion guide, but see all alternatives that can help lowering the cost for marketing as very interesting. Her personal conviction is that the brochure flora will be replaced with digital alternatives in the future.

The most significant barrier towards realising the excursion guide as a mobile data service is according to the manager of financial character. The small companies and excursion destinations represented in the guide do not have much financial means; that is the whole reason why the guide has been produced in the first place, in order to help these in their marketing efforts. If they were to partake in such a project, it is extremely vital that an accurate indication of the return on investment can be made, i.e. how many visitors has the mobile excursion guide generated. The manager state that before Hushållningssällskapet will consider introducing such a service it is important for them to know that the market has reached a certain maturity of technology acceptance, and that there is a demand for the service.

As the information found in the excursion guide is to some extent overlapping, meaning it also exists locally on websites and in print of municipalities and local tourist organisations, the manager's opinion is that a mobile version should better be managed by the local tourist organisations in every destination. She explains that "these are the actors holding the primary responsibility for product development" and further points out that "there is no prestige in who the commercial service provider is". Also, as Hushållningssällskapet do not possess much internal IT expertise and resources it is probably better if the administration of the mobile excursion guide could be shared by the destinations.

Apart from the excursion guide, the manager also declares that fishing tourists may perceive value in mobile data services. For instance, information on current water-levels and temperatures (which has an influence on the fish population), and coordinates on where certain fishes have been caught could be desirable information.

5.2.5 Boden tourism economic association (LTO in destination Boden)

The interviewed manager is the person making decisions on IT investments for use within the organisation, such as computers, Internet and mobile phones. As this organisation is an economic association, all IT investments that span outside the organisation and require members to embrace new technology must be anchored among these members. The manager admits not being interested in IT; however, she perceives it as tremendously valuable for her in her daily work. She explains that as a tourism manager you are frequently out of the office, and therefore, the ability to access e-mails through the mobile phone without being restricted to a physical location is especially useful. Regarding 3G she declares having a general knowledge of its characteristics.

About the organisation and the destination

Boden tourism economic association is a local tourist organisation in which companies, associations and organisations are joined together with the cause of developing the local tourism industry in Boden. This is achieved foremost through united marketing efforts, but also through competence- and product development, network building and spreading information and knowledge internally. The manager states its core competence lies within marketing. The organisation currently has 60 members from different businesses, e.g. accommodation facilities, activity companies, trade, transport, travel agencies and restaurants.

The long term business objective of the organisation is to develop Boden as a tourist destination; the short term objective is to attract visitors all seasons. In its capacity of being an economic association, the organisation is not meant to generate profit itself, but rather to attract more visitors to Boden so that its members can benefit.

The manager informs that they are aware of the need to work strategically towards stated qualitative goals. One such goal is to become one of the best tourist centers in Sweden. Boden wants to position itself as the family friendly destination. The types of tourists that come here vary with the different seasons. In the summer Norwegian and Swedish (from Norrbotten and Västerbotten) families with younger children come here to spend their holidays. These tourists generally do not plan their holiday in advance, a behaviour that evidently can be seen by all

the caravans that normally wait for days outside the camping to get a spot. However, it was also found in a survey, conducted last summer among tourists in Boden, Luleå and Piteå, that a large number of the responding tourists had acquired information on the Internet prior to their stay. Summer tourists on average stay for ten days. Tourists that visit Boden during the other seasons are generally groups of people and smaller conferences. These often plan their trip in advance and wish to participate in activities such as go fishing, driving dogsleds or snowmobiles. According to SCB (Swedish central bureau of statistics) Boden had 30.000 registered guest nights at commercial accommodation facilities in 2003. This was a seven percent increase compared to the year before.

Current use of IT

E-mail is used extensively within the organisation. It provides a valuable tool for communicating with customers (tourists) as well as with members. Also, the organisation has recently set up an Internet portal (www.upplevboden.nu) containing tourism related information that is often referred to as tourists have inquiries. The portal also encompasses an intranet where members can access timely information. The operation of the Internet portal is not performed in-house; it has been outsourced to a technical subcontractor as the organisation itself has no internal IT competence. The manager estimates that the cost of IT amounts to one percent of the total budget for marketing activities.

The organisation has no strategic plan regarding IT development. The manager informs that a probable cause for this is that no person within the company is actively pursuing questions regarding development within this field. The organisation's members differ in respect to IT in use. Some members are actively influencing the design of the Internet portal, whereas others do not even own a computer. The manager states that "the organisations' level of IT in use equals that of its members". The organisation is currently involved in a project called "i-Turistbyrå" which aims to develop the tourist center by using new technology. She does not know exactly what the project includes, but informs that it has previously been carried out in other destinations, among those Kiruna.

When asked about the organisation's attitude towards introducing new technology the manager identified it as being an analyser, i.e. it is seldom first with an innovation but aspire to be a fast follower once an innovation has proved itself in another destination. She sees the feature of letting tourists create their own travel guide online, prior to departure, as an indication of their innovativeness and willingness to stay ahead. They frequently use benchmarking methods; meaning they look at how other destinations work and then make judgements whether or not the same procedures are suitable to be implemented in Boden; the regions that act as benchmarks are the northern region in Finland (Finnish Lapland) and Åre.

Perceived barriers and enablers for mobile data technology

The most obvious barrier towards a mobile tourist guide is according to the manager the costs of implementing the technology since the industry is not capital-intensive. However, she thinks that as long as the project is interesting enough, and well defined, it should not be troublesome to acquire financial means. Members would bear some of the cost, but financial support could probably be granted from entities such as the County Administrative Board of Norrbotten and Almi Business Partner.

Printed material currently constitutes about 10% of the total costs for the organisation. Besides this, members too bear separate costs for printed material used in their own marketing. If a mobile tourist guide could function as a substitute for printed material, and thus help lowering these costs, it would be a very interesting alternative.

The most common ways of communicating with the tourists are through printed material and face-to-face contact at the tourism center in central Boden. Brochures are also distributed to different general stores and other information outlets within the destination in order to make information more accessible and not force tourists to visit the tourism center. As printed material becomes obsolete quickly, and the information outlets are poor at updating the material, tourists sometimes receive outdated material. Therefore, alternative ways of communicating with tourists to ensure that they receive topical information are desirable.

The manager believes that a mobile tourist guide can be beneficial for tourists visiting this region due to the long distances that exist between information points. She informs that “it could probably be of great help for tourists as it would add to their sense of security”. She points out that “if you take wrong road here, you may be screwed!”. Furthermore, one trend that has been observed among the tourists visiting Boden is that many wish to participate in activities, may if be golf, fishing, or visiting world heritage sites. Therefore, mobile data services that do not only offer information, but also allow tourists to interact with the surrounding through activities may be attractive.

The manager explains that since the organisation does not have the resources to update information for each and every one of its members, the sooner the information can be digitalized the better. This may constitute a significant barrier as not all of their members own a computer.

Also, based on personal experience, the manager informs that it is easier to push through decisions if the idea originates from “underneath” by one or several of the members. As it is unlikely that ideas concerning mobile data technology will be initiated by members, solutions based on such technology may be encountered with scepticism. The manager identifies a significant barrier in persuading members how mobile data technology can contribute to their business needs.

The manager concludes from personal experience that another potential barrier as to why many tourism organisations are not susceptible to technical change is that many technical service providers are poor at mediating their ideas and visions. This “language barrier” prevents tourism organisations from utilising technology, as they do not clearly understand how it can contribute to their needs.

The organisation does not have any information of its own that is wishes to communicate to tourists. It merely functions as an information lock that collects information from its members and makes it accessible through a common interface. If the mobile tourist guide would only contain tourism information that relates to Boden the manager states that the organisation is the actor best suited for the commercial service provider role. If the mobile tourist guide is to

be offered on a regional basis, she sees Norrbotten/Lappland as the most appropriate actor to take on the commercial service provider role.

The manager believes that Boden as a destination has enough tourism information that it could sustain a local tourist guide of its own. However, as tourists staying in Boden often move within a 100 kilometre radius, she reckons that the tourist guide would probably increase its attractiveness if it could cover the adjacent destinations of Luleå, Piteå and Älvsbyn as well. It would be valuable if the mobile tourist guide allows entrepreneurs from different destinations to engage in collaboration projects, tying these close together.

5.2.6 Piteå destination development

The interviewed manager states having an interest in new technology but admits to not being well-informed of 3G and the features of future mobile data technology. She has previous experience from using mobile data services privately and is content with their use.

About the organisation and the destination

Piteå destination development is an organisation jointly owned by the municipality of Piteå and the town's trade and industry. The main objective of the organisation is to develop the local tourism industry in Piteå, or put in other words, to attract more visitors, make them stay for longer periods of time and have them spending more money during their stay. The organisation is to act as a platform for the economic association *Piteå presents tourism and events*, and is responsible for implementing the KRAFT-process on a local basis.

The KRAFT-process has drawn up a common vision for Piteå that reads "*In 2010, the destination Piteå will be an open, innovative forerunner that offers unique experiences and events, all year and all round the clock*". Furthermore, it has stated ten "dare" commandments that explain how the vision is to be achieved. Two examples are "dare to be the first" and "dare to be curious".

The manager informs that they are, as part of the KRAFT-process, working on developing a new local tourist organisation that will come to replace the current economic association. The new organisation will probably not be an economic association but is more likely to have a corporate form. The reason for choosing this type of organisation form, in contrast to the destinations Boden and Kiruna that both have economic associations, is that Piteå has not received any financial support from the European Union. As a consequence of having to be financially self-supporting, the organisation cannot be completely dependent on members' financial contributions for survival, but must concentrate on generating revenue itself. It is therefore likely that investments will be made with an expected return on investment. The manager is convinced that it will be easier to push through decisions in the new organisation due to its organisational form. She explains that "in an economic association one must reach consensus among members, while in a corporation it is the board of directors that decides".

The Swedish foundation for knowledge- and competence development has designated Piteå as the national meeting place for the events and experience industry, which covers tourism, media and music. Piteå is the host for many events such as Piteå dansar och ler, Festspelen, Midnight Sun International and Piteå Summer Games. According to the manager, the

destination wants to uphold an image of being an IT and media district. A number of IT and media companies have in recent years been established in, and also migrated to, the region.

The destination wants to create a profile of being Scandinavia's most northern Riviera. In the summer, tourists come here to bathe, sun and shop. The manager informs that according to topical statistics Piteå account for 40% of all summer tourists in Norrbotten The rest of the year it is mostly conferences and congresses that are hosted. Piteå Havsbad gives the destination a great advantage in that it offers accommodation, conference halls, entertainment and activities in the same facility.

Most of the tourists visiting Piteå are from the near markets in Norrbotten, Västerbotten, and Northern Norway. The manager estimates that there are one million tourists visiting Piteå every year. However, she also informs that available statistics are not completely reliable as it is hard to define who is a tourist and who is not. She concludes that the organisation must take more responsibility over gathering information and compiling statistics in order to effectively compare differences occurring over time. One potential application area for mobile data technology could be to facilitate information gathering.

One trend that has been noted is that tourists are much more educated when they arrive; they are aware of what Piteå has to offer. However, there are many tourists that also fall into the category of not having planned their vacation prior to departure. Many foreign tourists seem to come here for just one product. For instance, recently there has been an increase in Italian tourists, conferences as well as private persons, who have come here solely to experience the ice breaker that is situated by the Piteå Havsbad.

Current use of IT

As Piteå destination development is partly owned by the municipality in Piteå all its IT is managed by the municipality's webmaster. In fact, all IT in use by the current local tourism organisation is administrated by the municipality's IT department.

The destination management system Tellus was purchased in 2003 with the purpose of making information about Piteå more accessible to tourists as well as to the domestic population. Previously, employees at the tourist center had to separately register information at the town portal (www.pitea.se) and in other national systems, which is not an efficient way of working. After implementing Tellus all information will be registered in a central database where the Swedish Travel and Tourism Council retrieves its information.

The manager cannot present concrete evidence that the system has led to improvements, but she believes it has facilitated for tourists in their search of information. She further informs that the Tellus system is pedagogical and very easy to use. Everybody that has been given a little training and an access code can use it, which is favourable since it reduces administrative tasks.

There are different people who exert influence when it comes to making investments in IT. It is often through exhibitions and references (other destinations in Sweden) that initial ideas are born. It is important to get positive feedback from the right person. According to the manager, the tourism industry is a very verbal industry where personal contacts and social relations are

important. As a consequence of this industry characteristic, many suppliers have been "black-listed" after that they have been known to under perform in one destination. After that a potential solution has been identified the municipality's IT department needs to be consulted before a final decision can be made.

Last year the destination was on free trial offered the opportunity to provide event information via a WAP portal. The manager does not have information on the number of tourists that used the portal during the trial, but her personal opinion is that it worked very well. She does not know why they did not keep the service, "it might have been lost in the transition to Tellus" she explains.

Among the four roles that firms can have in respect to new service development, the manager is firmly convinced that the organisation is an analyser. Norrbotten is not a region where organisations have the opportunity to be prospectors, especially not in respect to technology. "Concepts have generally been tested elsewhere first, before being imported to this region", she explains. An illustrative example that backs-up her statement of being an analyser is the fact that Piteå is the first destination in Norrbotten to implement the destination management system Tellus. This is the same system that Norrbotten/Lappland wants to implement throughout the entire region. She claims that the coast municipalities have in a traditional perspective had a positive attitude towards innovations. While others have showed reluctance towards trying new concepts, Piteå has dared to engage in odd ventures. As long as their budget allows it, they are prepared to take certain risks.

Perceived barriers and enablers for mobile data technology

At present, the most significant barrier that impedes adoption of a mobile tourist guide is the organisation itself. The first priority is to establish and maintain a well-functioning local tourist organisation. In its current form the organisation has little financial means. Also, since the new organisation is only in its infancy stage there is currently nobody who has been appointed the responsibility for IT investments.

In its capacity of being the national meeting place for the Swedish events and experience industry the destination can be suitable for the introduction of mobile data technology. Many industry conferences are held here, and as such new innovations may receive more exposure and national recognition by being on display in this destination.

It seems as if branding is an important issue, at least in respect to who is to pay for the implementation of mobile data technology. The manager explains that if Piteå is to pay for using the system they want to make sure their brand is "on top" and visible. This may cause a conflict in case of a regional tourist guide. She does not see it as a significant barrier, but informs that one should be aware that there will be a discussion. She also points out the importance of who the technical service provider is. If similar products were offered by different suppliers, for instance a well-known telecommunication operator and a smaller application development firm, they would probably go with the operator.

The manager believes more in a regional wide mobile tourist guide than in local destination guides. Her opinion is that Piteå has enough of an information flow to "stand on its own" as a local tourist guide, but it would probably be more attractive to tourists if it covered adjacent

destinations, or the entire region. Furthermore, she believes that a mobile tourist guide could be more valuable in sparsely populated areas than in larger cities. In rural areas, such as Norrbotten, a mobile tourist guide could be of assistance as there are not always people around that one can ask for directions. According to the manager, the adjacent destinations are seen as competitors but are also viewed as complements. The industry is characterised by "co-ompetition", i.e. competition and rivalry as well as cooperation.

If in deed a regional mobile tourist guide would be implemented, the manager sees Norrbotten/Lappland as a suitable actor for purchasing the system and adopting the commercial service provider role. She also reckons that this role does not necessarily have to be taken on by a tourist organisation. As the County Administrative Board of Norrbotten is involved in issues regarding regional development it also could be a potential commercial service provider.

The manager declares being a strong believer in maps with highlighted points of interest as a future attractive mobile tourist service, but expresses scepticism over push-marketing practices. Instead she thinks that a digital book of coupons that the tourist can download to the mobile terminal to be a more enticing option. Games that offer tourists interactive learning of destination was also brought up by the manager as a future potential mobile service.

According to the manager, it is unlikely that a mobile tourist guide can come to replace traditional brochures. She explains that tourists seem to be more and more in need of brochures every year. They also fulfil another purpose as tourists save them as tangible memories from their trips.

In a concluding remark the manager states that she is positive to a mobile touirst guide, as she sees all development as positive. She remembers hearing about one tourist entrepreneur further up north who, by being able to tell when aurora borealis would appear, alerted tourist via SMS of this natural phenomenon. When first hearing of this business model she thought "this will never work" but now she knows "it has worked very well for him". She is convinced that mobile data technology can add value to the tourist experience. It is all about understanding what tourists value. She also emphasises that it is crucial that the mobile service be heavily marketed as "these things do not sell themselves".

5.2.7 Kiruna Lappland (LTO in destination Kiruna)

The manager at Kiruna Lappland explained that he does not personally use mobile data services privately or at work. However, it became quite evident during the interview that he possessed technical knowledge and was aware of some of the future applications of mobile data technology.

About the organisation and the destination

The local tourist organisation Kiruna Lappland is an economic association that currently has 110 members. It was previously explained that organisations having this form does not exist in order to make a profit. As it is a member organisation its financial resources are generated through member fees and through performing services and coordinating activities of different sorts, such as organising events. The organisation's philosophy is that no financial capital is to

be saved; the generated surplus is to be used for marketing and promotion activities. The core competence of the organisation is according to the manager the ability to build well-functioning networks and its experience of the industry. This, he explains, guarantees quality and credibility.

The manager informs that he personally exerts great influence when it comes to making investments in new technology. The organisation is the ground-breaker that paves the way in development issues for the entire destination. The manager explains that members cannot interpose some sort of veto in issues that concern introducing new technology since it is impossible to reach consensus among 110 members. "The members fully trust that we are well-informed before introducing new innovations", the manager explains. Most members understand that if something is beneficial for a few entrepreneurs, it is beneficial for everybody.

The destination wants to position itself in the minds of tourists as an outdoor destination; as the last great, untouched wilderness in Europe. As such, the manager explains, the destination is extremely experience based. Their long-term objective is to become Northern Europe's (Northern Finland, Sweden and Norway) most attractive destination by 2010. In qualitative measures this implies doubling the number of guest nights from 300 000 to 600 000 by the year of 2010, and also to increase the number of people the industry employs from 400 to 1000 during the same time period. The manager informs that Kiruna is the largest tourism destination in Norrbotten, and that it accounts for 40% of all the guest nights in the region.

The tourists visiting the destination are very heterogeneous due to the fact that Kiruna is a large municipality with activities that appeal to different types of tourists. The destination has an area that equals half of Switzerland. For instance, on average 76% of the tourists are from Sweden, however the tourists visiting the largest attraction – the Ice hotel – are foreign, and half of these are English. The primary market of alpine facilities is on the other hand Mälardalen; the near market being secondary and northern Norway the third. The tourist center keeps very accurate statistics on the number and nationalities of tourists that visit their office for information. The data collection is performed manually by the employees, who over time have become quite skilful in investigating the matter.

The manager states that in terms of making investments in IT they are not interested in being the "guinea pig" as it is seen as too risky. He informs that "we are too small to be pioneers, and also we do not have the resources to make costly mistakes, instead we let others make the mistakes first. What we do needs to work well right from the beginning". There is no first-mover advantage as IT is not the core product.

Current use of IT

The manager informs that for them IT is much about accessibility. Surveys have shown that Europeans increasingly use the Internet to book their trips, and it is therefore important to work with smart web based tools in order to reach out to a global market. They are in the process of implementing a booking system – Res 360 – which is used in Åre, Sälen and Furunäsdalen. These destinations are used for benchmarking; the ones they compare themselves to. When choosing which booking system to implement they have looked at destinations that have a higher volume of tourists to accommodate than themselves. As these

destinations need to handle larger quantities of information, they know that the system has been thoroughly tested for errors.

The Internet portal (www.lappland.se) is administrated in-house and an intranet is also used in order to make information more accessible and timely for members. Also, a PC-telephony system has been installed, which allows them to forward incoming calls from tourists to entrepreneurs, and also, with the calling tourist's permission, insert personal details into a database. The manager explains that even though this feature is valuable, it has not been used thematically. It could be used to target specific segments, for instance send out hunting information to all tourists that have stated an interest in this activity.

Although not firmly specified, the organisation has an item regarding IT development in the overall strategy document. It covers issues such as the type of hardware and software to use, which booking system to implement, and defined demarcations. The persons responsible for looking over IT solutions are the manager himself and another associate. The primary reason for implementing IT is to become more efficient and eliminate duplication of work. Customers are constantly searching for more and more information, the Internet portal is a great tool which can be referred to as tourists have inquiries.

Perceived barriers and enablers for mobile data technology

The manager explains that it is extremely hard to assess tourists' preferences when it comes to mobile data technology. Trends show that tourists are increasingly appreciating electronic means of acquiring information, and the manager does not see why mobile data technology would make an exception.

From personal experience the manager concludes that new systems and technical innovations constantly spring up. These are often afflicted with many "cool" technical functions which often make them less user-friendly. It is crucial that the functions are simple to use and that they provide added value. He further explains that it is important that a mobile tourist guide not only functions as a complement that offers the same information as in brochures and on the fixed Internet. The manager makes clear that "if it does, it will only imply more costs for us. We cannot concentrate on everything as a mobile tourist guide is just yet another way of reaching out to the market". Therefore, it is imperative that it either replaces other means of communicating with the tourists, or that it offers added value that tourists are prepared to pay for.

The most significant barrier towards a mobile tourist guide is by the manager highlighted as members' "fear of technology". It always takes some time to get people to accept new ways of communicating. Take for example the use of e-mail. This is now considered a trivial and very general way of communicating; however, it took several years before members saw the advantages and made it their preferred method of communicating. Hence, one should be aware that a mobile tourist guide that requires members to adopt technology in order to update information will need a long "running-in" period. It is likely that everyone is not susceptible to change as they do not see having a mobile presence as a priority.

He explains that it is hard to know tourists' activities and whereabouts in cases where these have not purchased a pre-packaged trip. It would be interesting and also valuable to be able to

follow tourists during their visit, however it is important that this "tracking" is not perceived as intrusive by tourists. Their privacy must be respected at all times.

Even though the manager believes that there is a value in a regional mobile tourist guide, he thinks that they would probably benefit more from having connections towards Northern Norway. He explains that the tourists that come here do not visit Kiruna and Norrbotten; they visit Kiruna and the North Cape. The manager identifies Norrbotten/Lappland as the only actor suitable to take on the commercial service provider role in case of a regional mobile tourist guide, but recognises that it will need more resources to do so. "Norrbotten/Lappland is an actor that can take up the cudgels for bringing about an implementation, as in the case with the destination management system Tellus. However, it is important that its role is restricted in respect to administration so that it does not become a bottleneck", the manager explains. Therefore, Norrbotten/Lappland would have to administrate it together with the destinations.

The manager believes that there may be a value for mobile application developers in using the destination Kiruna as a pilot project. The organisation is good at marketing, and in its capacity of being a non-profit organisation it could probably create more news value in industry magazines than what a commercial enterprise could on its own. The manager explains that industry magazines usually do not want to help creating a hype and contribute to financial success of individual companies. However, if the product is destination-bound it may receive higher exposure in that it is being tested in a leading destination in Sweden.

The manager mentions that "a mobile tourist guide could be an alternative as long as it allows for information to be shared in a smart way and it does not take too much time and energy from other things and commitments". In a final comment he stresses the importance to ascertain who will make the investment, and who will benefit (make money) of the service, so that there is a clear distinction between roles and responsibilities.

'You are a product of your environment. So choose the environment that will best develop you toward your objective. Analyze your life in terms of its environment. Are the things around you helping you toward success - or are they holding you back'

- Clement Stone

Chapter 6 – Data Analysis

This chapter analyses the data that was obtained during the interviews and consists of two parts. Initially, each case will be subject for a within-case analysis of perceived barriers and enablers to mobile data technology adoption, in which the collected data will be compared with previous research in the area. This is followed by a cross-case analysis that compares the data from the different cases and depicts a distribution of the identified enablers and barriers in two separate tables.

6.1 Within-Case Analysis

Case 1 - Operator

The manager explained that since a mobile tourist guide must be made operator independent, i.e. be accessible by all tourists regardless of the operator with whom they have a subscription, it will probably not be provided by an operator. For such an application operators charge the content provider for providing it with means to access their mobile network infrastructure and invoicing system, and that the payment from users is always administrated by a third party. This implies that the interviewed operator restricts their effort to focus on the traffic transport and technical service provider roles described by Andersen (2002) in the case of a mobile tourist guide, and that there is a need for a third party to act as a intermediary between the operator and the content providers, i.e. a content aggregator. This was noted by Andersen (2002) who informed that the technical service providers are the players that ensure the investments in technical platforms to support service provision such as managing the billing and customer care platforms, and that the player assuming the portal function (content aggregation) is likely to require access to the technical service provider's systems.

According to the manager there exists no current satisfactory solution of how to charge subscriptions fees (such as premium-SMS and premium-MMS) from foreign tourists roaming in their network. This may constitute a significant barrier if the content is to be paid for, unless it can be solved through alternative payment methods.

The manager explained that users are always charged for the amount of sent and received data. In the evaluation of the CRUMPET project it was revealed that users preferred payment option for a mobile tourist guide was through subscription, i.e. paying once for a period of

usage. Consequently, a potential barrier that may impede diffusion among users for a mobile tourist guide is if operators do not deviate from their standpoint of charging based on data, and users perceive this payment alternative as being too expensive

Case 2 - Mobile Tourismo

As Mobile Tourismo is still performing tests to develop their product (the mobile tourist guide) it has not yet developed a formal business model. The tourists that have participated in the trials have done so for free. The future scenario mentioned by the interviewed manager was built on what Devine and Holmqvist (2001) call a user fee business model, in which Mobile Tourismo charges tourists for accessing the content through premium-SMS. Devine and Holmqvist (2001) stated that this type of business model can only be applied on condition that users are willing to pay for the service. In this model (*figure 2-7, p.26*), Mobile Tourismo can be seen as the content provider and operators as the billing parties, as Mobile Tourismo will have to establish revenue-sharing contracts with each of the operators for accessing their billing system.

If the content is charged for, tourists will question whether the content is worth paying for or not. User fee business models are not appropriate in instances where content providers want to distribute their information to a user base as large as possible. As this is most certainly true for the tourism industry, alternative revenue sources must be identified if it turns out that tourists are not prepared to pay for the service. The interviewed manager at Mobile Tourismo highlighted this dilemma when stating that it is not necessarily the tourists who alone have to pay for the service, tourist organisations may also be inclined to pay if it would allow them to benefit from cost reductions, e.g. in printed material or physical guides. This type of business model was by Devine and Holmqvist (2001) postulated as an improved efficiency model. The manager also mentioned that these two business models may be combined so that neither tourists nor tourist organisations alone have to bear the financial burden of the mobile tourist guide. This contradicts Devine and Holmqvist's (2001) statement on relationships between the different models, in which they conclude that the user fee model does not combine well with the improved efficiency model.

The manager saw a mobile tourist guide with integrated MMS marketing tools, which allows tourism entrepreneurs to send digital discount coupons to tourists, as a probable future development. Many researchers (Eriksson, 2003; Robins, 2003; Sadeh, 2002) has emphasised personalisation as an important aspect of mobile data services. Robins (2003) has concluded that users perceive unsolicited promotional messages as adding value as long as they are personalised and relevant. Therefore, if tourists show acceptance towards mobile marketing practices, it is also possible to utilise what Devine and Holmqvist (2001) have denoted a marketing core business model, since primary suppliers (restaurants, attractions, shops etc.) will also have incentives to contribute financially for being presented with the opportunity to market themselves via the mobile distribution channel. Harker and Van Akkeren (2002) stated that SMEs generally are preoccupied with survival, with a vision tightly focused on the short term return on investments due to their limited financial capabilities. As a consequence of SMEs having this focus, a mobile data service, such as digital discount coupons, stand a better chance of being adopted if an accurate indication of the return on the investment can be calculated.

Mobile Tourismo merely sees itself as being a technical sub-contractor and does not aspire to extend its role in the value map in any way. The manager stated that the company does not have any interest in exposing its brand towards the users (tourists), and therefore the commercial service provider role must be adopted by its customers (the tourist organisations). This implies that Mobile Tourismo wants to position itself in the application development segment of the mobile content value map described by Andersen (2002).

E-business strategy (2004) stressed that firms operating as content aggregators function as middlemen between the content originators and the distributors, justifying their place in the value map by creating a win-win situation for content originators and operators. The content aggregator provides value to content originators by negotiating intricate and time-consuming distribution deals with individual operators. For the operators, on the other hand, content aggregators create turnkey mobile data applications by combining content from numerous sources and integrating it into a single interface. The manager of Mobile Tourismo informed that the company do establish revenue-sharing contracts with operators for their mobile data solutions. However, it is wrong to view Mobile Tourismo as a content aggregator as it does not actively collect tourism content that is to be displayed in their mobile tourist guide.

Case 3 – Norrbotten/Lappland

According to the manager, the organisation is best categorised as what Kelly and Storey (2000) defined as an analyser in respect to new IT service development. IT is not seen as having an intrinsic value, e.g. something that would be image enhancing, it is merely viewed as a means that allows the organisation to become more efficient in its operations.

The manager informed that the organisation has a coordination function; it serves destinations in areas where these do not have time or resources themselves. It is responsible for operating the regional Internet portal, which is intended to create a win-win situation for tourist entrepreneurs and organisations as well as for prospective tourists. The portal allows tourist entrepreneurs to increase their visibility in the market and facilitates the search process of tourists by collecting and concentrating all information to a single “stage”. Sussman and Baker (1996) have commented on this, noticing that tourism products generally are benefiting from developments in IT, and that this technology might possibly be more beneficial for smaller establishments, which otherwise have limited ability to promote and distribute their products. Therefore, they explain, regional tourism offices may recognise a theoretical justification for stepping in, to improve the overall performance of the regional tourism industry. This can also be seen in that Norrbotten/Lappland is the driving force behind introducing the destination management system Tellus in the region.

It is uncertain whether or not the organisation is suitable to adopt a role in the mobile content value map, described by Andersen (2002), in respect to a regional mobile tourist guide. As the organisation does not have any information of its own, it cannot take on a content provider role. On the fixed Internet the actor functions as a portal content aggregator and a logical thought is therefore that it could adopt an analogous role for a regional mobile tourist guide as well. Andersen (2002) informed that fixed Internet portals are potential players for assuming the content aggregation or mobile portal role. The motivation for this statement is that fixed Internet portals have previous experience in the creation, packaging, and aggregation of digital content. Furthermore, they have relatively low deployment costs given that they have

most of the required infrastructure, and also, they have already established partnerships with content providers. There is, however, an essential difference between the fixed Internet portal and a mobile tourist guide, even though the latter in some cases may be considered a mobile Internet portal (e.g. CRUMPET). The fixed Internet portal is intended to assist tourists in the pre-consumption stage whereas any type of mobile tourist guide is meant to help them during their visit while on location. The mobile tourist guide is yet another way of communicating with tourists as they have arrived to Norrbotten, which means it would basically function as a complementary product to brochures with some value adding features. The manager informed that roles and responsibilities have been allocated so that destinations are self-determined in questions regarding making investments in IT, developing products, and deciding on how they wish to communicate with the market. This implies that a mobile tourist guide is outside Norrbotten/Lappland's area of responsibility.

The manager informed that it is the individual destination brands rather than Norrbotten/Lappland that should be exposed to tourists as these arrive on location. This indicates that the manager sees the destinations as the most suitable actors to adopt the commercial service provider role for local mobile tourist guides. Andersen (2002) stated that the actor taking on the commercial service provider role ensures the market facing aspects of providing the mobile content service. Most sales and marketing roles are assumed by the commercial service provider such as channel management (distribution channel), new and existing product development, brand development and public relations.

The organisation only employs two people and has therefore little resources to devote to administrative tasks of a regional mobile tourist guide. The manager stated that the information would need to be updated on a local level by the destinations. In the survey by Riemenschneider *et al*. (2003) it was concluded that employee time to maintain a web presence is a significant obstacle as to why small enterprises sometimes show reluctance towards adopting new technology. As with the Internet portal, the system administration (hosting the hardware and software) would need to be performed by a third party as the organisation itself does not have the internal expertise.

The manager explained that Norrbotten/Lappland's role in a regional mobile tourist guide could be to act as a coordinating link between the local mobile tourist guides, as a regional mobile tourist guide is basically just an extension of several local mobile tourist guides that have been joined together. For instance, it could provide a top-level welcome message that varies depending on the destination in which the tourist physically is at present, e.g. one that reads "Welcome to Norrbotten/Lappland, you are currently in destination Boden", and then shift this primary interface to "Welcome to Norrbotten/Lappland, you are currently in destination Piteå" as the tourist enters destination Piteå.

As in the case of the Tellus-system, Norrbotten/Lappland can be a driving force in bringing about a change; it can actively promote the mobile tourist guide in order to convince municipalities and destinations that it is a product that will benefit the entire regional tourism industry. The destinations will then have to take a stand-point whether or not they wish to pursue the idea. However, there is one major difference between the Tellus-system and a mobile tourist guide. The former is already an established product with many references, among them the destination Piteå. The latter is on the other hand until now a completely

untried alternative. The manager says that he needs to know that the perceived usefulness is in proportion to the cost of the investment before advocating new technology.

There may be application areas of mobile data technology where Norrbotten/Lappland has authority to act without having to consult its members. The manager informed that the organisation is responsible for conducting analyses and producing statistical reports that the destinations can use as support for decision making. Mobile data technology that would enable them to produce more accurate statistical information on tourists' behaviour would be of valuable assistance. He also reckoned the ability for visitors to give online feedback from visitors as a desired feature. This can be compared with the findings of Abell and Limm (1996), who in their study concluded that effectiveness in information gathering were among the reasons why small firms chose to adopt Internet technology.

The manager highlighted lack of financial resources as the most prominent barrier towards implementing a region wide mobile tourist guide. This supports the finding of Riemenscheider *et al*. (2003), who stated that financial assets constitute the primary obstacle towards IT adoption in small firms. Researchers such as Purao and Campbell (1998) and Duan *et al*. (2002) have also stressed start-up costs as a significant determinant on small firms' IT adoption decision. The manager informed that a probable explanation as to why many tourism entrepreneurs are reluctant to "investing" in a place on the regional Internet portal is that they are not presented with a qualitative measure of their return on investment. This relates to the theory provided by Harker and Van Akkeren (2002), which declared that SMEs are often in need of an immediate return on investment as they are concerned with medium-term survival rather than the long-term attainment of market share.

The manager also emphasised the necessity of increasing the information flow between destinations and explained that this is the reason why they are making efforts to implement a new destination management system in Norrbotten. The improvment of interaction between members of a network as an IT adoption enabler has been commented on by researchers such as Desruelle and Burgelman (2001) and Fillis *et al*. (2003). Although this does not comply with a mobile tourist guide, which is to be used by end users and not members of a network, it is interesting to note that improved interaction among members is a determinant for IT adoption.

The manager also commented that many foreign tourists visit Norrbotten because they wish to experience the exotic nature, the tranquillity, the adventure, and snow and cold. It is possible that these tourists are not interested in a mobile tourist guide as it may be seen as too commercial and thus not comply with the purpose of their visit. Purao and Campbell (1998) touch on this subject by stating that uncertainty of reaching a critical mass among business partners may constitute a significant barrier to IT adoption.

Case 4 - Hushållningssällskapet

The manager identified the organisation as being a defender on the new service development scale proposed by Kelly and Storey (2000). Her personal opinion is that IT could be used to a larger extent within the organisation than what is currently the case. She declared the age structure within the organisations as being an impeding factor as older people are often reluctant to change. Many researchers, e.g. Jones and Tilley (2003); Harker and Van Akkeren

(2002); Duan *et al*. (2002), have observed a low IT level of use within the organisation and lack of skills as significant barriers impeding IT adoption in small organisations. Also, Riemenschneider *et al*. (2003) have noticed that innovations that require staff training and learning efforts are more likely to be rejected by small firms.

The manager identified two areas in which she saw that future mobile data technology could be applied in the organisation. She declared being a strong believer in replacing traditional printed brochures with digital alternatives, and proposed a digital version of their printed excursion guide as a potential future mobile data service. Fishing tourism was also emphasised as an area in which mobile data technology could be used to add value. The manager stated that the destinations are better suited to adopt the commercial service provider role for a mobile version of the excursion guide of two reasons. Firstly, the information in the excursion guide is not exclusive but also exists to a large extent locally at websites and brochures offered by the destinations. Secondly, she pointed out that the destinations are the ones having the primary responsibility for product development. The manager did not want to disclose the cost of printing the excursion guide, but recognised all alternatives that could help lowering the cost of marketing activities as interesting. Many researchers (Riemenschneider *et al*., 2003; Poon & Strom, 1997; Poon & Swatman, 1997) emphasise cost reductions in other areas of the business as a significant enabler for IT adoption among SMEs.

The manager emphasised the financial aspect as the factor that would primarily impede the realisation of a mobile excursion guide. Researchers such as Purao and Campbell (1998) and Duan *et al*. (2002) have identified start-up costs as the most significant barrier towards IT adoption among SMEs. The manager further informed that before Hushållningssällskapet would consider introducing a mobile data service it must know that the market has reached a certain degree of technology acceptance and that tourists have expressed a need. This statement relates to Harker and Van Akkeren's (2002) comment on external pressure from the market as an enabling factor towards IT adoption. Also, Purao and Campbell (1998) commented on the need for organisations to know that a critical mass of business partners is online before adopting Internet technology.

The manager also pointed out that the willingness of small companies to contribute financially will be dependent on how exact a measure can be given of the return on their investment. Harker and Van Akkeren (2002) have commented on the need of small business owners for an immediate return on investment, and concluded this as a factor that can facilitate or inhibit IT adoption.

Case 5 - Boden tourism economic association (LTO in destination Boden)

The manager identified the organisation as being what Kelly and Storey (2000) have denoted an analyser in respect to new IT service development. She informed that as the local tourist organisation in Boden is an economic association, the decision to introduce a mobile tourist guide would have to be anchored among its members. She further explained that it is easier to find ready listeners for suggestions that originates from members on a "grass-root" level than for those that come from outside. This corresponds with the theory provided by McGregor and Gomes (1999), which concludes that the network within which the organisation operates have a significant impact on its decision making process regarding IT investments. As it is ultimately the members that decide whether or not a mobile tourist guide should be

implemented, their lack of IT in use and ignorance of how technology can contribute to their business needs is a major barrier impeding adoption. Researchers such as Jones and Tilley (2003), Harker and Van Akkeren (2002) and Duan *et al*. (2002) have observed organisational readiness as constituting a major barrier towards IT adoption.

The manager identified one potential barrier as their lack of resources to administrate and update information of a mobile tourist guide. From studying IT adoption decisions in small firms, Riemenschneider *et al*. (2003) concluded that employee time to maintain a web presence constitute a potential barrier to IT adoption. The manager stated that members themselves would have to update dynamic information. However, since the level of IT in use is low among many members, and in some cases even non-existent, their lack of skills may constitute a significant barrier impeding adoption.

The cost of implementing the system was also put forward by the manager as a critical determinant that would encourage or impede adoption. Many researchers, e.g. Purao and Campbell (1998), Duan *et al*. (2002), have observed that the start-up cost is especially influential on SMEs IT adoption decision. She also pointed out that the industry is not capital-intensive, which relates to Riemenschneider *et al*. (2003) conclusion about financial assets as the most significant barrier impeding IT adoption among small firms.

The manager saw it as positive if a mobile tourist guide, or any other type of mobile data service for that matter, could be used to increase collaboration between members in different destinations. Poon and Swatman (1997) have highlighted the ability to form and extend business networks as an enabler towards IT adoption.

According to the manager, the organisation has experienced some problems regarding keeping printed material up-to-date. She saw a mobile tourist guide as an interesting alternative if it would enable them to over bridge this problem, and ensure that topical information always is provided to tourists. In their study, Poon and Strom (1997) concluded that improvement in product delivery/time to market is an enabler for IT adoption in small firms. The manager also informed that if a mobile tourist guide could function as a substitute for printed material, and thus help lowering these costs, it would be a very interesting alternative. This relates to the findings of Riemenschneider *et al*. (2003), who concluded that small business managers see cost reductions in other areas of the business functions as the most desirable outcome of IT adoption. Poon and Strom (1997) and Poon and Swatman (1997) have also commented on reductions in communication cost and advertising cost respectively as enabling factors to IT adoption among SMEs.

The manager stressed the “language barrier”, which arises as technical service providers are poor at using lay-man terms, as a significant factor impeding IT adoption, as it prevents users from understanding the usefulness of their products. The Technology Acceptance Model by Davis (1989) states perceived usefulness as a critical determinant that affects people’s behaviour to adopt new technology.

According to the manager, a mobile tourist guide can be especially beneficial for tourists visiting Norrbotten due to the fact that there are long distances between different information points. Virtual reduction of physical distances was in the study of Desruelle and Burgelman (2001) seen as an enabler for adopting IT.

The manager was under the impression that Boden has enough information that it could sustain a local mobile tourist guide on its own. Harker and Van Akkeren (2002) have suggested that the level of information intensity in an organisation will have an effect on its willingness to adopt IT. Furthermore, the manager informed that as tourists visiting Boden often move within a 100 kilometre radius, it would probably be more attractive if it covered the adjacent destinations as well.

Case 6 – Piteå destination development

The interviewed manager explained that as the destination in Piteå is currently in the process of building a new local tourist organisation it must focus all its resources on this task. Therefore, the most significant barrier towards adopting IT lies presently in the organisation's lack of structure. The structural sophistication of the firm was by Van Akkeren and Cavaye (1999) posted as one determinant that could impede IT adoption. Also, as the organisation is still in an embryo stage, it currently does not hold any financial resources of its own, and consequently, the lack of financial assets currently constitutes a major barrier. Until the new organisation has been established all investments are made by the municipality.

The manager highlighted two important criteria that influenced the decision of implementing the Tellus destination management system. The first was to make information more accessible for tourists and the local population. Also, the system's pedagogical feature was considered valuable since it would allow more people to administrate the system. This corresponds well with the Technology Acceptance Model that states perceived usefulness and perceived ease of use as significant factors affecting IT adoption. It also relates to the statement by Riemenschneider *et al.* (2003) who concluded that IT investments that require extensive staff training and learning efforts will not be adopted.

The existence of alliances/networks was by McGregor and Gomes (1999) suggested as a factor that influences technology adoption by SMEs. This was also implied by the manager who emphasised the importance of having the right references as a significant enabler. She explained that the destination has good relations to the destinations Göteborg & Co, Åre, Umeå and Skellefteå. Thus, the network extends beyond the geographical area of Norrbotten.

The manager stated that the destination has an interest in upholding an image of being an IT and media district, and therefore mobile data technology could be seen as a means to achieve such a position. Using IT as a means to enhance company image has been commented on by Poon and Strom (1997) and Riemenschenider *et al.* (2003). The manager identified the destination as being what Kelly and Storey (2000) have denoted an analyser in respect to introducing new technology in the organisation. However, she also emphasised that the destination has traditionally had an innovative spirit and dared to take some risks. The ten commandments explicitly state that the destination should have an innovative attitude in order to realise its vision.

The manager believes that tourists would appreciate a mobile touirst guide as it would give them an increased sense of security, allowing them to access information regardless of location and time of the day. She perceives this as being especially important in a sparsely populated area like Norrbotten, as there may not always be people around to ask for

assistance. Walters and Lancaster (1999) state that customer value criteria can be expressed in terms of generic customer value criteria; security and reliability being two of these. Also, a mobile tourist guide implies a virtual reduction of physical distances since tourists do not have to locate tourist centers in every destination to obtain information. Desruelle and Burgelman (2001) have commented on this as being an enabler for adopting IT.

The use of mobile data technology to facilitate information gathering was also identified by the manager as a potential future application area. She raised a concern towards the accuracy of current statistics and informed that the organisation itself needs to take more responsibility in collecting data about tourists. This can be compared to Abell and Limm's (1996) study in which it was concluded that "effectiveness in information gathering" is a factor that enables IT adoption among small firms.

The manager believes that Piteå has enough information to create and sustain an attractive local mobile tourist guide, but recognises that tourists would probably find it more valuable the more destinations it encompasses. Harker and Van Akkeren (2002) have suggested that the level of information intensity in an organisation will have an effect on its willingness to adopt IT.

The organisation was last year, on trial, given the chance to offer event information via a WAP-portal, a mobile data service that the manager personally perceived as positive and value adding. Drawing inspiration from the compatibility attribute of Roger's (1995) diffusion of innovation theory, this may imply that this destination has a higher propensity to adopt mobile technology than others due to its past experiences.

Case 7 – Kiruna Lappland (LTO in destination Kiruna)

The local tourist organisation in Kiruna can clearly be classified as being what Kelly and Storey (2000) have denoted an analyser in respect to adopting new technology. The manager stated that when introducing new technology in the organisation it is important that the solution works well right from the beginning. Many cautionary measures are taken in the selection process as the organisation does not have the financial resources to take risks and make costly mistakes; it must hedge itself against financial risk. Thus, it can be concluded that the organisation's limited financial assets has a significant influence on its attitude towards implementing new technology. Lack of financial means was by Riemenschneider *et al.* (2003) highlighted as the most significant barrier towards IT adoption. SMEs generally have little slack resources to absorb the shocks of an unsuccessful IT investment. The fact that there is a need for the investment to work well right from the start also relates to Harker and Van Akkeren's (2002) statement that larger organisations can afford to have a long-term perspective on IT investments whereas SMEs are often in need of an immediate return on investment.

The manager informed that the decision to implement the booking system "Res 360" is a response to the trend that Europeans prefer to book their vacations online. This implies that it is market pressure rather than competitors that sets the conditions for IT adoption. Harker and Van Akkeren (2002) have stressed external pressure from the market as being a significant enabler influencing IT adoption. The manager emphasised that to them, IT is all about

accessibility. This relates to the study by Poon and Strom (1997), in which they concluded that easy access to potential customers is a factor that enables IT adoption among small firms.

The manager highlighted members' "fear of technology" as a significant barrier towards the implementation of a mobile tourist guide. Member organisations' inexperience may constitute a major obstacle in case Kiruna Lappland does not have sufficient manpower to administrate the system and some part must be adopted by members. Jones and Tilley (2003), Harker and Van Akkeren (2002), Duan *et al*. (2002) have all commented on organisational readiness, or low level of IT in use and lack of skills, as a barrier towards IT adoption among SMEs.

From personal experience the manager concluded that new technical innovations often concentrate on technological details while giving less attention to making them user-friendly. He stated that it is imperative that functions are simple to use and that they provide added value. This corresponds well with the Technology Acceptance Model, which addresses IT adoption, implementation and diffusion in terms of perceived ease of use and perceived usefulness based on behavioural intentions.

It was also revealed that as a mobile tourist guide is just another way of reaching out to the market it will not be adopted unless it replaces other means of communicating (e.g. brochures) else it will only imply more cost for the organisation. In their study, Riemenschneider *et al*. (2003) found that cost reductions in other business areas is the most desirable outcome of adopting IT in small firms.

The manager saw a mobile tourist guide as interesting if it allows for information to be shared in a smart way and does not take too much time and resources away from other commitments. Resources come in the forms of financial means and manpower, and consequently the manager's statement relates to the findings of Purao and Campbell (1998) and Duan *et al*. (2002), and Riemenschneider *et al*. (2003), who stressed start-up costs and employee time to maintain a (mobile) web presence respectively as significant barriers towards IT adoption among small firms.

It is difficult to get a clear understanding of tourists' whereabouts and the activities they engage in, in cases where these have not purchased a pre-packaged trip. The manager stated that he perceives value in being able to follow tourists during their visit, to obtain information on their behaviour. Improvements in information gathering were in the study by Abell and Limm (1996) identified as a major motive for adopting IT.

6.2 Cross-Case Analysis

The literature body on IT adoption practices by SMEs pointed out managers' personal attitude towards IT as a major determinant influencing the organisation's decision to adopt or not adopt new technology. The interviewed tourism organisation managers were therefore asked to state their personal interest in, and past experience with, mobile data technology. The literature also declared that an organisation's current level of IT in use is influential on its willingness to adopt technological innovations. Consequently, this parameter was also gauged.

There were no evident correlation found between the managers' previous experiences with mobile data technology and their attitude towards its future use. Even though some of the managers seemed to have less experience of mobile data services than others, most of them recognised how the technology can come to play a part in the future. However, their opinions differed in respect to what will be considered future attractive mobile data services. One manager was confident that digital means will come to replace brochures whereas other managers did not see this as a likely transition. One manager expressed being a believer in push marketing practices while this was viewed with scepticism by another. It is possible that their previous experience, or lack thereof, is influencing what they perceive as future attractive mobile data services.

All organisations, with an exception for Hushållningssällskapet, are similar in their level of IT in use as they all operate Internet portals; Norrbotten/Lappland on a regional level and the local tourist organisations on local levels. Although there are some discrepancies, for instance Piteå being the first destination to implement Tellus, and Kiruna being the first to implement the booking system "Res 360", all these managers view their organisations as being analysers in respect to introducing new technology. The manager at Hushållningssällskapet on the other hand had a deviant opinion and identified the organisation as being a defender in this respect. The managers expressed a need to see the results of how a mobile tourist guide has been accepted in other destinations, to get an indication of how tourists' value the innovation, before they would consider implementing it. This relates to the observability attribute in Roger's (1995) classical Diffusion of Innovation theory, which declares that an innovation is more likely to be adopted if its effects are visible to potential adopters through other members of a social system. Friar and Balachandra (1999) have also touched upon the subject stating that there is a need for major innovations to prove themselves in new markets before they can displace other technologies. Also, a parallel can be drawn to Ambell and Limm's (1996) study which concluded that lack of guidance of how to start a process is a barrier to IT adoption. The organisations feel that they need someone to fall back on for advice in order to avoid pitfalls.

It was revealed that the organisations have taken different approaches in terms of how to administrate their IT. Norrbotten/Lappland and Boden have outsourced the operations of their Internet portals, whereas Kiruna and Piteå (in its current organisational form) both manage theirs in-house. It is interesting to note that the managers for Norrbotten/Lappland and Boden raised a concern for lack of resources to update information while the managers in Piteå and Kiruna did not bring it up. Although these destinations probably do not have more resources to devote to administrative tasks, their higher level of internal expertise may have been the reason why the managers did not identify this as a barrier.

It is also interesting that although both local tourist organisations in Boden and Kiruna are economic associations, the manager in Boden expressed that it is sometimes hard to push through propositions whereas the manager in Kiruna did not see this as a problem. A possible cause for this is that the organisation in Kiruna has existed longer than the one in Boden, and has therefore had a longer time to build up a trust among its members.

None of the interviewed organisations have any formal strategic plan when it comes to IT development. A pervading characteristic is that they view IT as a supporting means to become

more efficient in their operations. There was only one manager who saw IT as a means to enhance the image of the destination.

The manager at Piteå destination development was the only one of the interviewees who said that future investments may be made with a return on investment in consideration. The fact that none of the other tourist organisations saw the possibility of generating revenue as an enabler can probably be explained by the fact that they are economic associations, and as such do not exist for the purpose of making profit. Instead, their primary objective is to promote the economic interests of their members.

There are contradicting views whether or not a mobile tourist guide is seen as too commercial for foreign tourists. One manager implied that it may be seen as a barrier as it does not comply with the purpose of their trip to Norrbotten. Another manager was under the impression that even though tourists want to experience the wilderness, they probably welcome the increased sense of security that a mobile tourist guide can provide.

Tables 6-1 and *6-2* on the following pages present a distribution of enablers and barriers identified by the respondents that would affect their IT adoption decision. The first column of each table illustrates the enablers and barriers that the literature stated would either encourage or impede IT adoption among small firms, while the first row presents the five interviewed tourism organisations. The mobile telecommunications operator and application developer (Mobile Tourismo) are not represented as their roles are to facilitate information distribution and develop mobile solutions respectively, and not to adopt IT. The potential financial gain is their sole purpose for adopting roles in the mobile content value map.

Table 6-1, Enablers for adopting IT identified by the respondents

Enabler	Norrbotten/Lappland	Hush.sällskapet	Boden Tourism	Piteå	Kiruna/Lappland
Generate revenue				X	
Cost reductions		X	X		X
Greater customer satisfaction					
Short ROI	X[1]	X[1]			
Organisational readiness - high IT level of use within organisation - internal experience					
Product delivery/Time to market			X		
Effectiveness in information gathering	X			X	X
Easy access to potential customers					X
High level of information intensity			X	X	
Company image enhancement				X	
Improve interaction between members of a network	X				
Form and extend business networks			X	X	
External pressure to adopt		X			X
Virtual reduction of physical distance			X	X	
Keep pace with competition					
Prepare for the future					

[1] The manager recognised that innovations that can give members an accurate indication of their return on investment are more likely to be adopted.

Table 6-2, Barriers for adopting IT identified by the respondents

Barrier	Norrbotten/Lappland	Hush.sällskapet	Boden Tourism	Piteå	Kiruna/Lappland
Costs (start-up costs)	X	X	X	X	X
Lack of guidance about how to start the process					
Critical mass among business partners (customers are not online)	X	X			
Financial assets	X	X	X	X	X
Long ROI	X[1]	X[1]			
Organisational readiness - low IT level of use within organisation - lack of skills		X	X[2]		X[2]
Require training staff/learning effort		X		X	
Employee time to maintain web presence	X		X		X
Firm's structural sophistication				X	
Low level of information intensity					
Security hazards					
"Language barrier" [3]			X		

[1] The manager recognised that innovations that can give members an accurate indication of their return on investment are more likely to be adopted.

[2] As this organisation is an economic association, the manager recognised that its members' low level of organisational readiness may constitute a barrier.

[3] The "language barrier", or the inability of technical application developers to proclaim the usefulness of an innovation, was not covered by literature.

It should be noted that some of the enablers found in *table 6-1* are interrelated and that this may explain why certain enablers were not explicitly identified by the managers as encouraging IT adoption. For instance, greater customer satisfaction was not mentioned by any of the managers as a factor that would encourage adoption, which may seem surprising considering that the tourism industry is a service industry. However, the managers did

implicitly discuss customer satisfaction when pointing out perceived usefulness, market acceptance for mobile services and an expressed need from tourists as determinants for adoption. Also, three organisations stated that cost reductions in other areas of the business are desirable outcomes from adopting a mobile tourist guide. In order for the organisations to benefit from cost reductions tourists must first perceive value in the mobile tourist guide and adopt it.

None of the respondents identified the barrier "lack of guidance about how to start the process". A probable explanation for this is that neither of the managers proclaimed having a prospector attitude towards new IT service development, which implies that they rely on external sources for new ideas and guidance. Also, as a consequence of no actor having a prospector attitude it is not surprising that the enabler "prepare for the future" did not come up during conversation.

The enabler "keep pace with competition" or introduction of IT as a means to achieve competitive advantage was not mentioned by either one of the respondents. However, all of the destination managers informed that benchmarking methods are applied in order to identify new innovative ways of working. The Swedish ski resort Åre was mentioned by all three managers as a destination that serves as a benchmark.

'Let us take things as we find them: let us not attempt to distort them into what they are not. We cannot make facts. All our wishing cannot change them. We must use them.'

- John Henry Cardinal Newman

Chapter 7 – Findings & Conclusions

This chapter aims to answer the two research questions that were provided in the theoretical frame of reference (chapter 3). Each research question is recapitulated and elaborated on by discussing some of the findings stemming from the interviews. The last section in the chapter discusses areas that are advisable for further research.

7.1 Research Question 1 - How can the structure of the tourism industry in Norrbotten be described?

Many people have recognised the importance of tourism for the future economical development of Norrbotten. In order to increase the attractiveness and competitiveness of the region tourist organisations and entrepreneurs have realised the necessity of working together. As a result of this insight, the industry is currently undergoing significant changes. The development process "Up2Us" have been initiated by the regional tourist organisation Norrbotten/Lappland in order to create a common vision for the entire region, as well as for the different destinations it encompasses. The name of the process alludes to the fact that the industry itself to a large extent is responsible for its own success and survival, and that collaboration and coordination is vital for achieving the stated goals.

Norrbotten/Lappland is a regional umbrella organisation with the main objective to develop and promote the tourism industry in the region. The organisation is an economic association; members are tourism entrepreneurs, tourist organisations, municipalities, authorities, trade and other businesses, more or less anybody that will benefit from an increase in the number of tourists visiting this region. It performs overarching marketing activities in order to create a common image for the entire region, conducts analyses, coordinates projects, and acts as a "contact surface" between national tourism organisations and members. There is only one organisation besides Norrbotten/Lappland that deals with tourism on a regional level. This organisation - Hushållningssällskapet - is a regional based knowledge organisation that offers advisory services to, and carries out development projects for, small rural companies. It has expertise within a number of areas, two of which are tourism for rural areas and fishing tourism.

The region has been divided in eight different destinations, in which the Up2Us-process is implemented on a local basis. The destinations are Kiruna/Gällivare, Eastern Norrbotten

(Tornedalen/Haparanda/Kalix), Jokkmokk, Arvidsjaur/Arjeplog, Luleå, Boden, Piteå and Älvsbyn. The destinations are in different stages of the process, some have come further than others. At present there are only two destinations that already have well-functioning local tourist organisations established; but others will follow in a couple of years. The ownership structure varies between the destinations. For instance, the local tourist organisations in Boden and Kiruna are both economic associations, whereas in Piteå, the future local tourist organisation will have a corporate form.

The destinations have all formulated their own vision and profile, i.e. how they wish to position themselves in the minds of tourists, some have even defined their target markets. The industry is characterised by "co-ompetition", a mix between cooperation and competition. The destinations cooperate in the pre-consumption phase in order to create a product which caters to the needs of a larger number of tourists than what they could each sustain on their own. However, as the tourists arrive to the region the collaboration turns into competition and each destination tries to entice tourists to spend as much time and money on the primary suppliers residing in their destination respectively. Every destination has an individual responsibility for product development, making investments, competence development and how it wishes to communicate with the targeted markets.

7.2 Research Question 2 - How can enablers and barriers for adopting roles in a future value map for a mobile tourist guide in Norrbotten be characterised?

Findings from this exploratory research question suggest there are many different factors that will have an impact on tourism organisation managers' decision to adopt or not adopt mobile data technology. Many of the enablers and barriers put forth by the literature on small firms' IT adoption were covered during the interviews with the tourism organisation managers.

From the interviews it has been concluded that the tourism industry is an industry with scarce financial resources. This characteristic has by many been pointed out as the most significant barrier towards adoption of new technology. The extent to which lack of financial means is seen as a barrier is highly dependent on the type of business model utilised. The main question that needs to be addressed is; who is to pay for the service? The literature stated that user-fee business models can only be used on condition that users are willing to pay for the content. If these are being charged a high rate for the amount of sent and received data, which is the preferred payment method of operators, they may not be inclined to pay any additional fees. If tourists are not prepared to pay a user-fee, for instance through premium-SMS, then where will application developers, such as Mobile Tourismo, generate their revenue? The alternative is to charge the tourist organisations by using an improved efficiency business model. However, in order to leverage such a business model, it is necessary that the effect of the mobile data service on the organisation's business (either through savings or increase in revenue) can be measured in a quantitative and accurate way. It was revealed that a mobile tourist guide cannot merely act as a complement to other market communication activities, it must replace them or else it will just imply more costs for the tourist organisations.

Operators' attitude that all traffic in the mobile networks should be charged based on the amount of data sent and received may have a significant impact on users' willingness to use certain mobile data services. One way of over bridging this barrier would be to offer a mobile tourist guide application that is not delivered over a mobile network, but instead downloaded directly on to the mobile terminal, and thus cut the operators out of the loop. The biggest drawback of such a solution is that far less content can be offered as the application is restricted to the capabilities of the mobile terminal on which it is used. As the mobile terminal may not have capacity to support a regional tourist guide, all destinations may have to separately provide their own local tourist guides which tourists have to download in turns.

The overall impression among the interviewed tourism organisation managers seems to be positive for the future use of mobile data technology. However, it was revealed that none of the interviewed managers see their organisation as a prospector in terms of adopting new technology. As a consequence of no actor having a prospective attitude it is reasonable to believe that Norrbotten will not be a pioneer when it comes to implementing new mobile data technology for tourism. Most of the organisations identified themselves as being analysers, meaning that they tend to be fast followers once an innovation has proved itself in another destination. One of the managers explained that the industry is very verbal and that it is important for technological innovations to have the right references in order to be adopted. There are innovations that have been "black-listed" as a direct result of not meeting expectations. It is likely that a mobile tourist guide, or any other type of mobile data service for that matter, will spread to this region first after that it has been successfully implemented in one of the destinations that serve as benchmarks.

One factor that may facilitate or inhibit adoption is the organisational form of local tourist organisations. Many of the interviewed tourism organisations are economic associations with the primary objective to promote the economic interests of its members. This corporate form requires that members approve in questions regarding making investments of the sort a mobile data tourist guide implies. Therefore, the managers of such organisations may have a cumbersome task persuading members of the potential benefits that this new technology can bring. It is important that their members, and also other local primary suppliers, are educated in the potential benefits of a mobile tourist guide so that they understand how it can contribute to their business needs. More than one manager stated that primary suppliers are more likely to adopt the innovation if they are able to see the direct results of the return on their investment, if they are able to calculate how much revenue their investment has generated.

It is not evidently clear which roles in the mobile content value map different actors are most suitable for. A probable cause for this is that the mobile content value map has not been constructed with a service such as a mobile tourist guide in consideration and is therefore a bit vague in its application. The content aggregator role is especially dubious, as it is uncertain whether or not such a role exists for a service as a mobile tourist guide. The roles that different actors will choose to adopt are to a large extent dependent on how the mobile tourist guide is designed. For instance, the level of static and dynamic content is an influential factor that will determine whether or not local tourist organisations can administrate their own local tourist guides. The more dynamic the information, the sooner it has to be administrated and made digital, preferably at the level of the SMEs. These constitute the largest and possibly the most important information source of tourist information. They have often low or no

knowledge of IT and no opportunities to create mobile solutions for information and marketing tasks.

The manager at Mobile Tourismo said that tourist organisations can choose to host the mobile tourist guide on a server of their own, or to outsource the technical operation to Mobile Tourismo. In an article by Svenska Dagbladet (published on April 1st), the manager stated that the most natural would be that the server is hosted by the actor providing the information. Two of the interviewed local tourist organisations perform their IT operation in-house, while the third has chosen to outsource it to a technical subcontractor. It is possible that the preferred type of hosting solution will be dependent on if the IT operation has been outsourced or if it is performed in-house. *Table 7-1*, on the following page, presents a possible distribution of the required roles in the mobile content value map, described by Andersen (2002), to the interviewed players.

Many of the interviewed managers stated that they perceive greater value in a regional mobile tourist guide, one that covers the entire Norrbotten or adjacent destinations, than in local ones. The awareness of cooperation and coordination is probably a result of the Up2Us-process, which emphasises the importance of collaboration in order to increase the attractiveness and competitiveness of the region. As a regional mobile tourist guide would basically be nothing more than a number of local guides that have been merged, the primary responsibility for making the investment and administrating the system would still be placed on the destinations. The regional tourist organisation Norrbotten/Lappland could possibly help in raising funds on a regional level, in the case of a regional mobile tourist guide, however the costs should principally be carried by the actors that will benefit the most from implementing the mobile tourist guide.

Some of the potential outcomes that can be expected from the introduction of a mobile tourist guide are:

- *Tourists* will be provided with a mobile assistant that will enable them to interact more efficiently with primary suppliers, navigate more easily in the destination or region and receive only required and relevant information through a number of context-aware mechanisms (the most important being location).

- *Primary suppliers* (the large group producing the basic tourist components such as accommodation, entertainment and catering and that mostly consists of SMEs) will obtain not just an alternative channel for promoting their material, but a way of receiving rich information on their prospective customers, and a tool for efficiently organising their business communications.

- *Regional- and local tourism organisations* can be provided with services that enable them to receive rich statistical information on tourists for future use.

Table 7-1, Possible mobile content value map roles of interviewed actors

Role\ Player	Operator	Mobile Tourismo (ASP)	N/L (RTO)	Hush.sällskapet	Boden Tourism (LTO)	Dest. Piteå	Kiruna Lappland (LTO)
Technical service provider							
Provider of infrastructure & billing mechanisms	X						
Administrate software		X				X[1]	X[1]
Content provider							
Content originator							
Content aggregator							
Negotiate contracts with operators		X					
Collect content and update the information					X[2]	X[2]	X[2]
Commercial service provider							
Marketing & creating brand awareness of service			X[3]		X	X	X

[1] The Internet portal is administrated in-house and therefore it is possible that the actor would choose to host a mobile tourist guide in-house as well

[2] The amount of static/dynamic information decides whether the organisation can adopt this role or if administration must propagate down to the level of SMEs.

[3] Norrbotten/Lappland can adopt this role for a regional tourist guide in order to facilitate for tourists to overview the situation. However, it is on condition that there is consensus among members.

Potential revenue streams that can support the viability and wealth of a business model are:

- Application service providers can collect revenues from selling syndicated and customised content (e.g. statistical reports) to regional- and local tourist organisations.
- Rental fees paid by local- and regional tourist organisations to an application service provider (if the mobile tourist guide is hosted by the application service provider).
- Advertisement fees paid by primary suppliers to the actor hosting the mobile tourist guide (local/regional tourist organisations or an application service provider) for the placement of their ads in the site of the mobile tourist guide.
- Extra fees hidden in the fees that members pay the economic associations (regional- and local tourist organisations) so that these are able to finance a rental or purchase contract to an application service provider or application developer respectively.

There are also other issues that a mobile tourist guide may bring forth. For instance, should there be regulations that restrict the type of content that is allowed to be presented in the guide. If so, there must be an actor that controls that the primary suppliers comply with the stated norms.

It seems as if the most probable scenario of a mobile tourist guide will be similar to that of the Tellus system, i.e. that it is initiated on a local level by one of the destinations and will then spread to a regional level if proved beneficial. It is also likely that the mobile tourist guide has proved itself elsewhere, possibly in one of the destinations serving as benchmarks, before a pioneering destination in Norrbotten will consider an introduction.

7.3 Further Research

This study provides a deeper understanding of facilitators and barriers to the adoption of a mobile tourist guide in Norrbotten by regional- and local tourist organisations. Essentially, insight is provided about how the mobile content value map could be constructed for such an application, but also the type of revenue model that could be utilised has been discussed. This knowledge is valuable for the creation of a future business model. Aggarwal *et al*. (1998) inform that there are two perspectives from which innovations can be examined: that of the provider and that of the consumer. They explain that from the providers' perspective topics of inquiry are likely to include the creation or discovery of innovations, and their screening, evaluation, and factors contributing to successful commercialisation. From the consumers' perspective topics include their perception of the newness of a product, information processing, consumer learning and choice processes. This research has the perspective of the former. The scope of the study basically corresponds to the initial stages of the business model development process described by the eMporio project (highlighted in *figure 7-1*, p.96). In accordance with this model, future research should be concerned with conducting financial analyses on the investment required as well as on the corresponding potential of the target markets. This implies examining the mobile tourist guide from the perspective of the tourists. However, one must be aware that it is difficult, if not even impossible, to make

accurate forecasts concerning tourists adoption of a mobile tourist guide. There are numerous examples of failures to predict or change the behaviour of large groups of consumers in certain ways. Regardless of the technical refinements made to increase accessibility of information, to make comparisons and purchases easier or faster, consumers do not easily abandon old habits and behavioural patterns.

Kangis and Ranklin (1996) note that new products frequently appear to be technology driven rather than market led because advances in technology often produce the innovation before a need is expressed. This is most certainly true in the case of 3G services such as a future mobile tourist guide. Friar and Balachandra (1999) concur when reasoning that for the successful commercialisation of a new technology, one has to determine both the application or function the technology is to fulfil and the customer groups or market segments that will be most interested in the technology and its function. For an emerging or radical technology, however, the market may not yet exist and the target customers and their needs may not be explicitly known. Even if a target market is chosen, the customer's needs may remain latent so that gaining an understanding of customers through demand-derived marketing techniques provides little, if any, information. According to the authors, this leads to a situation in which the exact functions and target customers are often determined *after* the technical breakthrough, and further development is required for the technology to serve some specific function. How interested customers will be in obtaining the benefits provided by a mobile tourist guide, and how much they are prepared to pay for them, remains unknown. Designing this service to make it attractive to buyers, at an acceptable price, is the core marketing task.

Both statistics and reality show that Europeans have an increasing interest in Norrbotten and Lappland as a tourism destination. The actors residing in the industry have realised that this region will become more and more dependent on tourism in the future, and as a consequence it is currently undergoing significant restructuring in order to prepare for the future. Whether it can deliver an increasingly efficient, high quality service to meet the rising demand – and whether it can do this most effectively by embracing new technology – remains to be seen. For all consumers of these services, life – and their interaction with hotels, restaurants, attractions, activities and their like – will change, hopefully for the better.

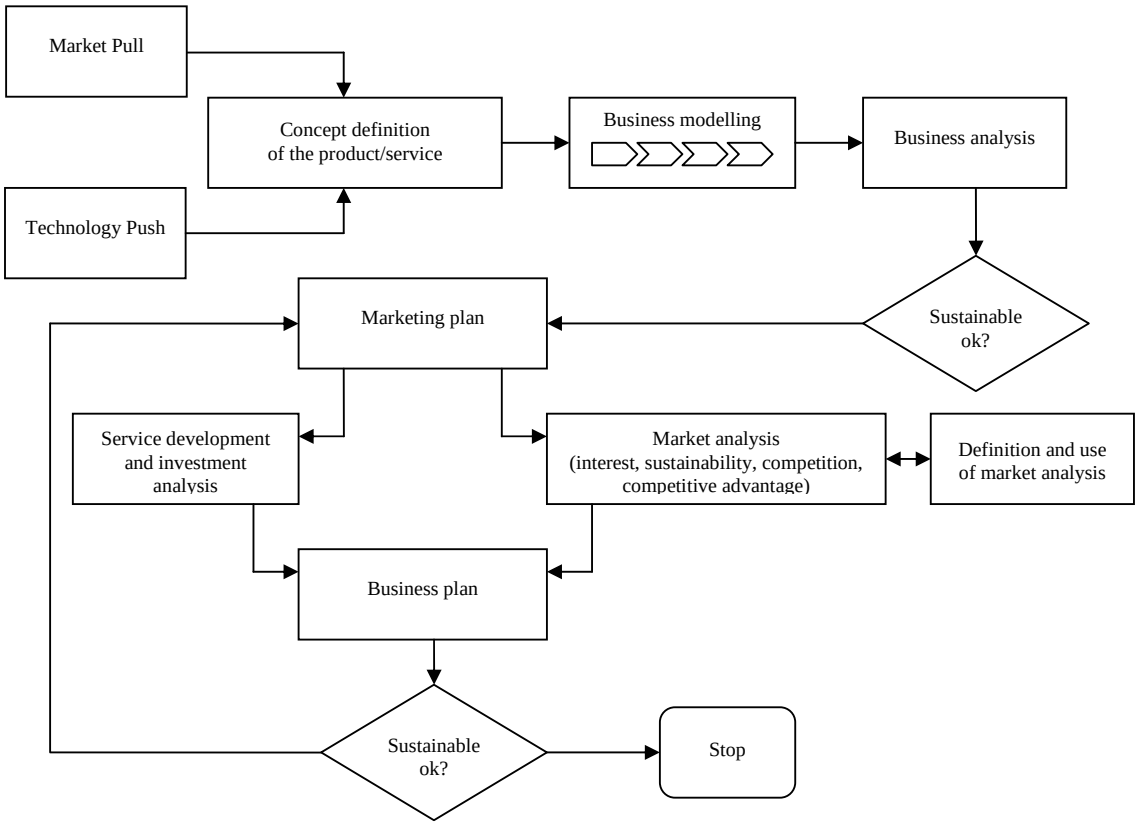

Figure 7-1, Development of a business model (Source: Eurescom, 2002)

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Gustafsson Barbro, Project coordinator (Norrbotten/Lappland)

Jysky Birgitta, Rural tourism consultant (Hushållningssällskapet)

Larsson Anders, development manager (Mobile Tourismo)

Lidström Stina, destination developer manager (Piteå destination development)

Salomonsson Peter, CEO (Kiruna/Lappland)

Åström Mats, CEO/head of projects (Norrbotten/Lappland)

Content enabling manager (Operator)

Appendix – Interview Template

Name of organisation:

Name of Interviewee:

Title/position within the organisation:

Q1) How interested are you personally in information technology and mobile data technology? Have you previously used mobile data technology (work/privately)? What is your opinion about mobile data technology?

Q2) How would you like to describe your organisation's core competence?

Q3) Which short term/long term organisational goals does your organisation have?

Q4) How do you wish to position your organisation (destination)?

Q5) Which customer groups do you aim to attract?

Q6) How is IT currently used within the organisation?

Q7) Why did you introduce IT in the organisation?

Q8) Does your organisation have a formal IT strategy?

Q9) How does your organisation work with new service development/introduction of IT? Who influences the decision? How much influence do you personally exert? Is there anything you feel impede development/introduction of IT?

Q10) Which of the following attitudes towards IT service development would you say your organisation has? Why?

- *Prospector*. Values being "first" with new products, markets and technologies.
- *Analyser*. Seldom first to market, but frequently a fast follower with a more cost-efficient or innovative product.
- *Defender*. Locates and maintains a secure niche by protecting their position in a relatively stable product or service area.
- *Reactor*. Responds to product and market changes only when forced by environmental pressures.

Q11) Does your organisation make investments with financial return on invested capital in consideration?

Q12) Does your organisation have content of its own that it would like to distribute via a mobile channel?

Demonstration of the mobile tourist guide

Q13) Do you believe that a mobile data service such as the mobile tourist guide would be beneficial for tourists visiting your destination/region? Why/why not? Do you perceive any enablers or barriers that could encourage or inhibit the realisation of such a service?

Q14) Do you see your own organisation as a suitable actor for taking on any of the following roles? (Commercial service provision/content aggregation/ content creation) Why/why not?

Q15) Are there any other application areas in which you think mobile data technology could be successfully exploited?