



HANDELSHÖGSKOLAN
I STOCKHOLM
STOCKHOLM SCHOOL OF ECONOMICS



Creating intelligence within the Telecommunications industry

**Stockholm School of Economics
Stockholm School of Entrepreneurship**

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Tutor: Sven Hamrefors

**Authors:
Mårten Jegenstam
Tor Kihlberg**

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We think that it has been very interesting to write this thesis. It has given us a deep insight into the complexity of the Telecommunications industry. We have furthermore gained a good understanding for how the Telecom operators could deal with this complexity and create more intelligent organizations. We believe that the subject of this thesis is and will become even more important in the future. As the technology is rapidly developing there will be improved prerequisites for creating more intelligent Telecom operators.

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Tor Kihlberg

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1 Introduction

1.1 Background

“Today and in the future, companies that succeed will be those that know how to manage knowledge faster than competitors. It isn’t a question of getting new information. It’s the ability to extract information from your existing business, to see trends and insights faster than your competition.”- Louis V. Gerstner Jr., IBM Chairman and Chief Executive Officer.¹

The business landscape of the Telecommunications (Telecom) industry is changing rapidly in many ways.² Because of this the Telecom operators (Telcos) now face a huge challenge to adapt their business models. The changing business landscape has increased the need for the Telcos to create more intelligent organizations.

1.1.1 Changing business landscape

The business landscape shaped by a monopolist has been replaced by a landscape with a large number of Telcos competing at a global arena.³ The deregulation of the Swedish Telecom industry initiated a period of high growth. Deregulation all over the world and increased globalization has led to fierce competition at the Swedish Telecom industry. This market is today one of the most prominent in the world as the customers are very mature, demanding and technically advanced. Many global actors therefore use Sweden as a test market. This has resulted in that there are many actors on the Swedish Telecom industry in relation to its size. At the same time as the rivalry increases the growth within the traditional parts of the Telecom industry is slowing down.

Furthermore the complexity of the Telecom industry is increasing. The chain from order to delivery of the services is very long and complex. This is because the services in themselves are complex and that there are often many actors involved in the production. Fast technical development has led to an integration of industries, for example the Telecom and the Datacom that were separated only a couple of years ago. The capacity of the networks and the end equipment has increased dramatically during the last couple of years, which has in combination with the mentioned integration led to an increasing number of services.

In a deregulated Telecom world the customer is quick to change Telcos as there are many alternatives available. Initially after the deregulation the customers didn’t dare to change operator as this meant uncertainty and thereby a risk. Over time this perceived uncertainty has decreased contributing to increasing customer churn. Another reason to why customer churn is increasing is that the customers are

¹ At the Securities Industry Association’s annual convention in Boca Raton, October 1997, as quoted in Grandy, Cheryl, “Power + Performance for Marketing Databases”, Dynamic Information System Corporation.

² This section is based on our interviews with the Telcos (see references) as well as the articles mentioned in the footnotes.

³ “Data Warehousing for the Telecommunications Industry”, Informix, USA, 1998.

becoming more and more individualized in their needs.⁴ This means that it is no longer a viable strategy to mass-market the services to the customers.⁵ A third reason is that it is hard for the Telcos to differentiate themselves from the competitors in the eyes of the customers. Customer churn is a great problem for the Telcos as it can have a very high impact on their profitability. This is because it costs a lot more to acquire a new customer than to keep an old one and it also costs a lot to win back the lost customer. Furthermore chances are that the existing customers would gradually buy more services over time. Altogether the cost of losing a single customer is therefore much more than the immediate revenue lost.⁶

The stock markets have realized that the business landscape is changing and that this will inevitably in a profound way affect the Telcos. Before, the Telcos used to be valued mainly on the size of the customer base, that is revenues, but they are now to a greater extent being valued on profitability.

1.1.2 Changing business model

Only a couple of years ago it was common for the Telcos to have a product-oriented strategy. Most Telcos were operating at low levels in the value chain offering the customers generic services. As the margins were high especially in the years after the deregulation the Telcos in general focused at gaining as many new customers as possible since every new customer meant increased profit. The Telcos were mass-marketing their services and in order to compete they were forced to aggressively increase marketing while discounting their services. This strategy was viable since the strong market growth compensated for the low prices. However the growth on generic services is no longer high enough and the product-oriented strategy has lead to low customer loyalty. Thereby the Telcos that continue to use a product-oriented strategy face the threat of unacceptably low margins.

Due to the changing business landscape there is a need among the Telcos to change their business models. Today the Telcos are therefore adopting more customer-oriented strategies.⁷ The era of mass marketing and mass production of undifferentiated services is about to come to an end and be replaced by a strive towards mass customization.⁸ In order to avoid the decreasing margins on the generic services, many Telcos are trying to climb the value chain. This implies offering more complex services to bigger and more demanding customers. Another reason for climbing the value chain is that customers increasingly demand this. To attract new customers the Telcos need to better understand customer behavior and to a larger extent tailor services to the customers' needs. To fight churn the Telcos must segment the customers, build relations and nurture the relations to them. Building relationships with the customers is very much about selling the future to them and this requires a good knowledge of what their business looks like and what services they will need in

⁴ McClain, Duncan, "Customer Data Integration: The Essential Component of Effective CRM", DM Review, June 2000.

⁵ Schroeck, Michael, "Insights from the Front Line: Understanding the Telecom Customer", DM Review, July 1999.

⁶ Molony, David, "The Business: Operators learn true value of customer care", CWI, 29/11/99.

⁷ Osterfelt, Susan, "Business Intelligence: The Whole Customer", DM Review, June 2000.

⁸ Faltys, John, "Rules-Based Software for Telecommunications Targeted Marketing", DM Direct, March 2000.

the future. This makes it very important for the Telcos to be able to foresee the future, to be flexible and to act proactively.

1.1.3 The challenge

The Telcos today face a huge challenge to quickly restructure themselves according to the changing business landscape. Characteristic for the industry is the enormous amount of information about customers and services available in the networks (the communications infrastructure) and in the many internal systems of the Telcos.⁹ The Telcos thereby have great prerequisites to create more intelligent organizations that are more customer-oriented. They however have to become better at making use of these possibilities. It takes technology to be able to make use of the vast amount of information that Telcos can access. The technology, which can enable the Telcos to more quickly and cost-effectively obtain and integrate this information, has not been available until recently.^{10 11}

In a turbulent and competitive environment such as the Telecom industry, market opportunities only exist for a short while. If the Telcos lack or can't take care of the information from the environment they will do business independently of what the situation looks like at the market. To sum up the Telcos have to take advantage of their most valuable asset, that is information, to excel in the competitive Telecom industry (see figure 1).

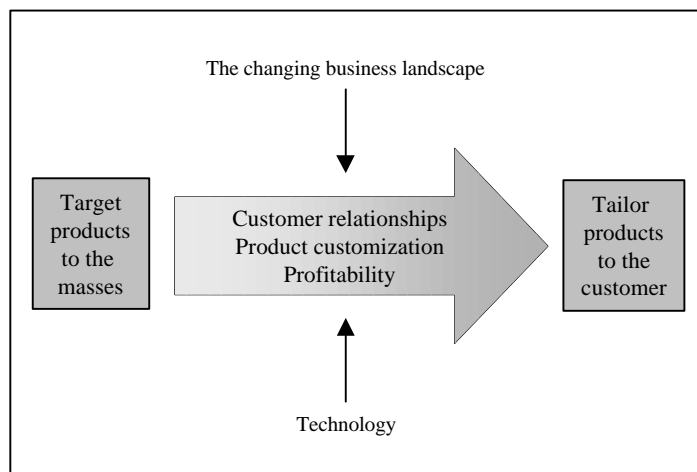


Figure 1. The changing business model

1.2 Purpose

The main purpose of this thesis is to analyze how the Telcos can make use of the technology of today in order to create more intelligent organizations. The purpose is in other words to analyze how Telcos can achieve more directed environmental

⁹ Biddlecombe, Elizabeth and Shetty, Vineeta, "Taken out of storage", CI, 01/08/98.

¹⁰ Goldman, Lawrence, "Customer Relationship Management: The Future of CRM Toys", DM Review, January 2000.

¹¹ McClain, Duncan, "Customer Data Integration: The Essential Component of Effective CRM", DM Review, June 2000.

scanning in order to be able to foresee the future, change its behavior according to this and thereby act proactively.

Our two more specific purposes are:

- I. To analyze the Telcos abilities to make use of the technology of today, in the different phases of their development, in order to create more intelligent organizations in praxis.
- II. To examine whether the Telcos would converge in intelligence through implementing exactly the same technology.

1.3 Delimitation

We have in this thesis studied the Telecom industry. Within the Telecom industry we have limited this thesis to cover the Swedish market. This is one of the most developed Telecom markets in the world and most global Telcos are represented here. The tough competition and the mature and demanding customers have forced the operators to start creating more intelligent organizations. Furthermore we have chosen only to consider how an organization can be made more intelligent from a customer and service perspective. We thereby haven't taken the intelligence activities that are directed towards competitors in the business environment into account. In this thesis we have used a specific business intelligence (BI) Solution as a starting point. We have primarily focused on the concept/benefits of the BI Solution rather than the technical aspects. These benefits might be achieved with other technical solutions. The conclusions of this thesis are therefore theoretically solution independent. Finally we have focused on how the Telcos can make use of the information that is embedded in the networks and internal systems in order to create a more intelligent organization.

1.4 Methodology

The first step in this thesis was to contact EHPT that is a company at the forefront in delivering BI solutions to the Telecom industry (see appendix). We did this in order to gain a deeper insight into how the technology of today in general, and EHPT's BI Solution in specific, theoretically can be used to create intelligence within the Telcos. At EHPT we performed a large number of interviews with people in the BI-team (see references). We also read a lot of information material from EHPT about the BI Solution. The next step was to create a hypothesis about different Telcos' degrees of maturity. This step was inspired by a large number of articles that we read about the Telecom industry (see references).

We then selected a number of Telcos that we thought would represent different degrees of maturity. This was our approach to get a holistic view of the Swedish Telecom industry. We then performed a large number of deep interviews at the selected Telcos (see references). Before we started to perform our interviews we put together a questionnaire. We used this questionnaire during all the interviews in order to be able to draw generalized conclusions from the answers. Within each Telco we focused on interviewing the potential users of the BI Solution. We identified these users to be mainly managers within the Sales, Marketing and Product area. Product

development, marketing and sales also make up three central and linked processes within the business of the Telcos. We also interviewed a few IT specialists, at Telcos within the different phases, in order to get a more complete picture of the business of the Telcos. In this thesis we have for secrecy reasons not expressed in words what the specific individuals have said. We have furthermore not explicitly assigned the Telcos to the different phases of development in our model.

In order to get a theoretical framework for this thesis we attended a course, “Creating Intelligence”, at the Stockholm School of Economics during the autumn. The person responsible for this course was our tutor Sven Hamrefors. This course introduced a rich spectrum of methods that can be used in the organizational structure and processes to facilitate awareness of the business environment. We also read Sven Hamrefors dissertation that formed the basis for this course. The theoretical framework used in this thesis is our interpretation of Sven Hamrefors’ model for creating intelligence.

It is finally important to keep in mind that we have an entrepreneurial approach in this thesis. This implies that we have to a large extent created our own models of the reality. In this thesis we have applied Sven Hamrefors’ model on the Telecom industry and in doing this created our own models. First we have described the BI Solution and how it can create intelligence according to the model. Second we have created our own model of how the Telcos have developed over time until now. Through using the theoretical framework we have in this model described how intelligent Telcos generally are in the different phases of development. To make the model generally applicable we have complemented it with factors that have positive or/and negative effects on the creation of intelligence. Through putting all previous parts of the thesis together we have finally drawn conclusions in order to answer our purposes.

1.5 Disposition

In this thesis the reader is first given a background to why the Telcos’ need for creating more intelligent organizations has increased during the last couple of years (section 1).

We then present our theoretical framework (section 2). In this part of the thesis we define the concept BI and present a theoretical model for how to create a more intelligent organization.

In section 3 and 4 we present the BI Solution that is an example of what the technology of today, with the theoretical model as a starting point, theoretically can do to create a more intelligent organization.

In order to be able to describe how the BI Solution can help create more intelligent Telcos in a real context we describe how the Telcos have developed over time until today (section 5).

In section 6 we give examples of factors that can help explain the fact that some Telcos are more intelligent than others are though they have been on the Telecom market for the same number of years.

In section 7 we draw conclusions in order to answer our purposes.

Finally in section 8 we give the reader a summary of this thesis.

2 Theoretical framework

In this section we define the concept “BI” and introduce our interpretation of a theoretical model for creating intelligence within organizations developed by Sven Hamrefors.¹² BI is a central concept in this thesis since it makes it possible for us to place the BI Solution more explicitly into the model for creating intelligence.

2.1 Business Intelligence

BI is a broad concept with many definitions. We define in this thesis BI as a continuous and well-organized process for creating and delivering perspectives (\approx pictures) about the environment throughout the organization. BI is in other words not as simple as delivering information but rather to deliver perspectives. BI is often conducted in the way described in section “The Business Intelligence Cycle”. Especially when the environment is complex and turbulent BI becomes an important tool for creating a more intelligent organization.

2.2 The model for creating intelligence

2.2.1 The core of the model

The theoretical model for creating intelligence, that we apply in this thesis on the Telecom industry, explains how the individual’s work situation and the general organizational situation affect the individual’s spontaneous environmental scanning (see appendix). It is possible to affect both the focus and the intensity of the individual’s spontaneous environmental scanning in order to create a more intelligent organization. Focus is what particular areas of reality the scanning is directed towards and how wide the scanning is. Intensity on its behalf is how frequent an individual is in his/her scanning of the parts of the environment that he/she is focusing on. The individual’s work situation has a narrowing effect on the focus while the general situation of the organization has a widening effect. The work situation also affects the intensity of the individual’s scanning.

The model thus builds on the fact that an organization is made out of individuals and that every individual creates his/her own perspectives of the environment. According to the model the individual’s perspectives are to a great extent influenced by the organization and the individuals are at the same time influencing the organization. The core of the model is that this perspective-giving and perspective-taking result in the individual’s perspective making. It is therefore necessary to take both individual as well as organizational factors into consideration to be able to create intelligence within an organization. It is furthermore of vital importance to achieve a balance

¹² Hamrefors, Sven, “Spontaneous environmental scanning- Putting “putting into perspective” into perspective”, Dissertation, Stockholm School of Economics, 1999.

between order (the whole organization) and variability (the individual). To succeed in the intention to create a more intelligent organization all parts of the organization must be made more intelligent.

2.2.2 The individual's work situation

According to the model different individuals have different perspectives of the environment. The individual's environment can be divided into three distinct parts, the enacted, the contextual and the remote environment (see figure 2). The enacted environment is the environment where the individual acts and feels familiar. This is therefore the part of the environment where he/she is most efficient in his/her spontaneous scanning. The contextual environment embeds the enacted environment. Events that occur in the contextual environment are perceived by the individual as likely to influence the enacted environment. The individual has in other words fairly well established personal theories about the relationships between this part of the environment and the enacted environment. In the ideal situation the individual perceives the organizational environment as his/her own contextual environment. The part of the environment that is normally perceived by the individual as not being important is called the remote environment. If the individual is narrow-minded he/she doesn't give this part of the environment enough consideration.

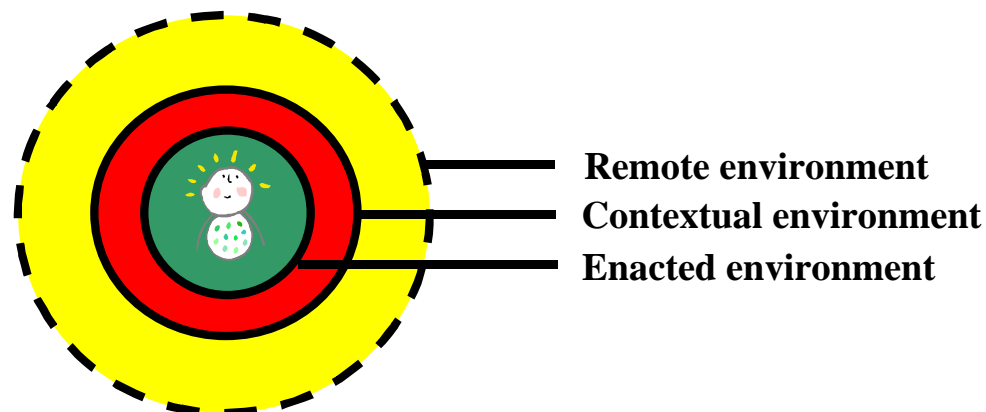


Figure 2. The individual's environment

2.2.2.1 The Learning Cycle

The individual constantly scans and makes perspectives of the environment. This scanning and perspective making can be described with "The Learning Cycle" that consists of five steps (see figure 3). These steps are not distinct from each other since the process is continuous and performed unconsciously by the individual.

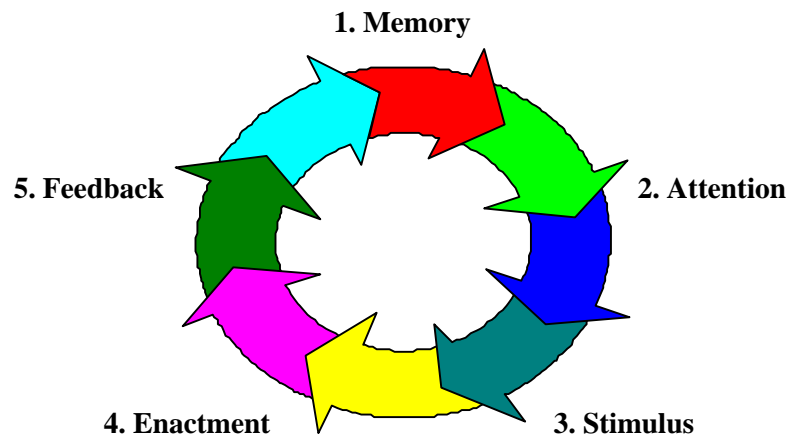


Figure 3. “The Learning Cycle”

2.2.2.1.1 Memory

The memory, that is the aggregated knowledge of the individual, affects how he/she scans in his/her work situation. The perspective that the individual makes about his/her environment is in other words affected by both previous and present experience of certain situations.

2.2.2.1.2 Attention

The individual chooses based on the memory to scan a certain part of the environment. The individual looks mostly for information that reinforces the perspectives that he/she already has. He/she therefore tends to be selective and scan for familiar situations, that is where he/she knows “the name of the game”. The individual’s spontaneous environmental scanning is most effective in his/her enacted environment. If an individual doesn’t know how things in the environment relate then there is a risk for a too narrow scanning. This can be enlightened by the following quotation of Mark Twain; “When all you have as a tool is a hammer all problems start to look like nails!”¹³

2.2.2.1.3 Stimulus

When an individual scans the environment he/she receives stimulus from the environment.

2.2.2.1.4 Enactment

The individual takes in the new stimulus and interprets these according to his/her enacted environment. If there is a fit between the new stimulus and previous experiences the individual feels more familiar with the situation. The individual feels in other words more enacted. If the individual feels enacted he/she starts to predict future events.

2.2.2.1.5 Feedback

Provided that the individual gets feedback about the actual outcome of the events that he/she has predicted his/her feeling of understanding increases. In the case that there is no feedback the individual still perceives a feeling of understanding but this might

¹³ Hamrefors, Sven, “Spontaneous environmental scanning- Putting “putting into perspective” into perspective”, Dissertation, Stockholm School of Economics, 1999, s. 94.

not be as correct as in the previous case. Feedback is in other words of vital importance as it decreases the risk for superstition within the organization. The individual's perceived feeling of understanding finally affects the memory which in turn influences the individual's attention and so on. This forms the continuous process that is called "The Learning Cycle".

2.2.2.2 Content

The individual's work situation consists of three parts, which is called "the content" in the model. The content of the work situation is what tools (systems, et cetera) the individual uses in his/her work situation, the individual's competence and finally the definition of the individual's task. These three factors interact with the individual's brain narrowing the focus of the spontaneous environmental scanning to issues that are relevant to his/her memory. In a system there is a selected amount of information available. In isolation systems can therefore have a narrowing effect. The competence has also a narrowing effect because the individual as we mentioned scans where he/she perceives that the situation is familiar. Finally, the more defined the individual's task is the more focused he/she is in his/her scanning. For example if an individual is a product manager responsible for only one clearly defined service he/she often focuses narrowly on this service.

2.2.2.3 Personal flow

While the content of the work situation affects the focus of the individual's spontaneous environmental scanning, what is called "the personal flow" in the model affects the intensity. The personal flow is to what extent the demands upon the individual are perceived by him/her to be in line with his/her perceived proficiency. If they are in line the individual's motivation, attention and creativity increases which leads to a more intense scanning.

2.2.3 The general organizational situation

One central part of the model is that an individual can never be intelligent in isolation as intelligence is created through interaction with others. When individuals get together a structure with roles, general rules and routines et cetera. is created among them. Every organization goes in other words through some sort of structural process. The structure can both facilitate and hamper the individual's perspective making. If for example there are general rules that dominate the business too much a compliance effect takes place. This implies that the decision making is too much facilitated, leading to group thinking and a situation where everybody has the same perspectives. This is dangerous, as the focus of the whole organization becomes too narrow.

There are according to the model three main ways to influence the structural process. These are transparency, knowledge transfer and coordinating logic. The three factors are dependent on each other and in order to create a more intelligent organization they must harmonize. Through improving the transparency, the knowledge transfer and the coordinating logic of the organization it is possible to widening the focus of the individual's spontaneous environmental scanning and thereby create a more intelligent organization.

2.2.3.1 Transparency

It is possible to create a more intelligent organization through increasing the transparency within the organization, that is making it easier for the individual to look through the organization. The transparency is decided by the physical, social and policy structure of the organization. The physical structure describes how different parts of the organization are related to each other. The social structure is about how well the roles of interaction within the organization are developed. Finally the policy structure is how the corporate policies are formulated and communicated. If the policy structure is good the individual understands the desired corporate role stated in the policies. This creates a common framework for what the individual should focus on in his/her spontaneous environmental scanning. The individual also better understands why he/she ought to scan in a certain direction. If the organization is well structured in these three aspects the transparency is good.

2.2.3.2 Knowledge transfer

It is also possible to create a more intelligent organization through facilitating the knowledge transfer. Knowledge transfer is about the organization's ability to communicate. This ability has two dimensions, the first is how easy it is for the individual to get in contact with knowledge sources either through meeting other people or getting access to stored knowledge. The other dimension of knowledge transfer is how easy it is for the individual to reach the right receivers with the right message in the right way at the right time.

2.2.3.3 Coordinating logic

It is finally possible to create a more intelligent organization through strengthening the coordinating logic. Coordinating logic is how well the individual understands how the organizational environment relates to his/her enacted environment. If the business processes flow smoothly, that is there are no bottlenecks, it is easier for the individual to understand them. The process being smooth implies that the individual can apprehend more information from these and thereby the coordinating logic is strengthened. This in turn leads to a widened focus of the individual's spontaneous environmental scanning. How the processes are organized also affects the coordinating logic. If the organization has decentralized processes these become fragmented and therefore difficult for the individual to understand. Decentralization leads at the same time to that the individuals create more diverse perspectives than if the processes are centralized. It is therefore necessary to achieve a balance between these two ways of organizing the processes to be able to create an intelligent organization.

2.2.4 The BI Cycle

In the ideal situation there is an organized scanning that complements the individuals' spontaneous environmental scanning within the organization. "The BI Cycle" (see figure 4) is a model that describes how BI can be conducted in an organized way. BI can be described as a process consisting of six distinct steps. This organized scanning is done in a process that resembles "The Learning Cycle" previously described. In fact the process for organized scanning ("The BI Cycle") has been developed with "The Learning Cycle" as a starting point. The big difference between the two cycles is that "The BI Cycle" is a conscious and well-structured process with distinct steps while, as

mentioned before, “The Learning Cycle” is mostly unconscious and performed in unseparable steps within the individual’s brain.

The first step in “The BI Cycle” is to define the information needs of the organization. Then a hypothesis about how to fulfill these needs is created in order to direct the search for the relevant information. The next step is to analyze the information that has been collected and then to disseminate it throughout the organization. The disseminated information supports the actions of the individual decision-makers. Through analyzing the outcome of these actions it is possible to redefine the information needs of the organization. The cycle shows that BI is a process that is continuous over time. This is necessary, as the organization must change according to the constantly changing environment.

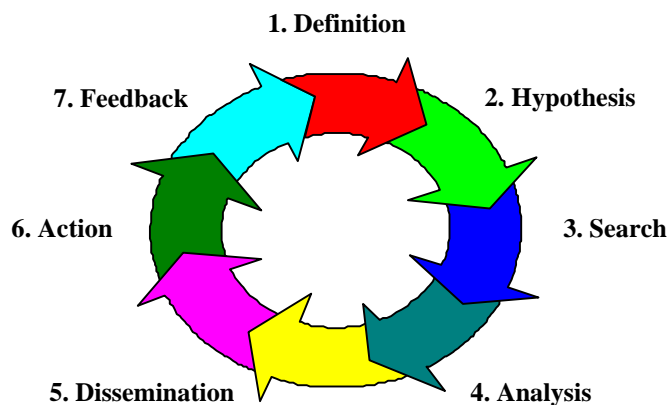


Figure 4. “The BI Cycle”

Organized scanning can be achieved by making use of technology to scan the environment in accordance with “The BI Cycle”. Organized scanning can also be achieved through initiating a BI-unit that is responsible for scanning the unscanned, in other words to fill up the blind spots of the organization. Another responsibility of such a unit would be to make the incomprehensive more comprehensive, that is broadening the individual’s perspectives to take the remote environment into consideration. It is of vital importance that the BI-unit challenges old myths and truths that normally exist within an organization. As the employees tend to scan for opportunities a BI-unit also has to reveal threats. These threats can often be turned into opportunities.

2.2.5 Directed scanning

The challenge in creating an intelligent organization is to achieve directed scanning of the individuals. This implies to increase the individual’s ability to focus on the tasks that are relevant to the individual and at the same time broadening his/her perspectives in order to enable him/her to catch the unexpected. When the individual’s spontaneous environmental scanning is characterized by monitoring the focus is too narrow. When the scanning is undirected it is on the other hand too wide (see figure 5).

As people broaden their perspectives they will to some extent overlap each other in their scanning. This facilitates internal communication of the information and increases the probability that there will be a critical mass of people in the organization sharing the new perspectives.

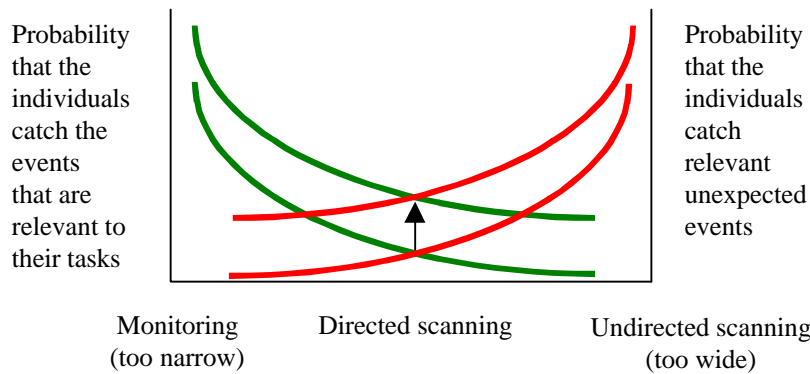


Figure 5. Directed scanning

To create an intelligent organization it is necessary to encourage the individual's spontaneous environmental scanning. Equally important is to create prerequisites for organized BI. The result of successfully using the model is a more directed scanning leading to an organization with an improved capability to foresee the future, to change its behavior according to the changing conditions in the environment and to act proactively. These three factors constitute an entrepreneurial behavior which is characteristic for an intelligent business (see figure 6).

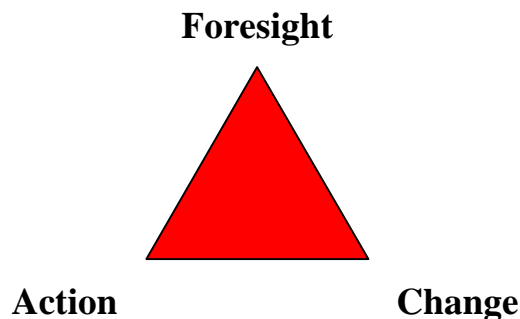


Figure 6. Entrepreneurial behavior characteristic for an intelligent business

3 The Business Intelligence Solution

In this section we describe the technical development of solutions offered to the Telecom industry. This development reflects the changing needs of the Telcos. We then give the reader a simplified overview of the BI Solution. This section is based on interviews with the BI team at EHPT and internal information material about the Solution.

3.1 The general technical development

Specific to the Telecom industry is the large amount of information about the customers and services that exist in the network and the various internal systems of the Telcos such as billing systems et cetera. This information is still largely untapped by the Telcos. One reason to this is that the technology, which can enable the Telcos to quickly and cost-effectively obtain and integrate this information, has not been available until recently.

There has been a clear shift in the focus of the systems developed for the Telecom industry. Until recently the Telcos prioritized network performance management. Network performance management implies monitoring and analyzing the total network performance, enabling network resource usage to be optimized. The network performance management solutions provide statistical data mainly to Network Planners, Network Engineers and Operations departments.

Due to the changing business landscape, described in the background, the traditional network performance management solutions can't fulfill the new needs of the Telcos. As the Telcos to a large extent have been product-oriented the next step for them was to collect data about the services in order to monitor and guarantee their quality. This is often called service performance management. Therefore the suppliers developed solutions that took care of this need of the Telcos. Today there is a strong trend towards the Telcos becoming more customer-oriented. This has increased the Telcos' need for BI solutions. The technological development, which is a result of the ever-changing business landscape, is described in figure 7.

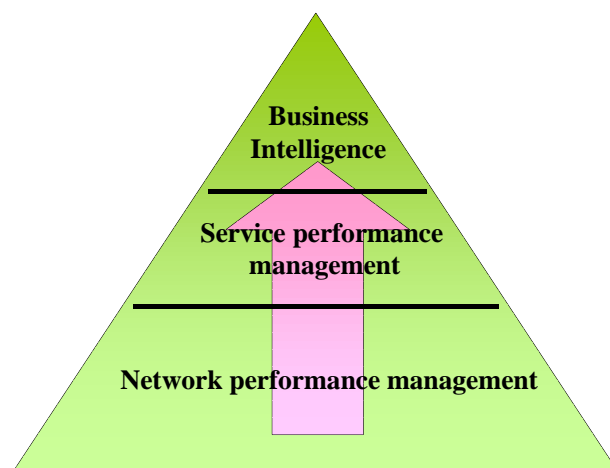


Figure 7. The technological development

3.2 Overview

The BI Solution in this thesis has, as we mentioned in the beginning, been developed by EHPT (see appendix). The Solution is an example of what the technology of today can help the Telcos achieve within the BI area. By turning data from several different sources of input into business knowledge, the Solution helps the user to reach new levels of knowledge regarding its customers, services and network. The BI Solution can contribute to creating more organized scanning. This is done in the way that is

described in “The BI Cycle” (see section 2.2.4). The BI Solution that is at the front edge consists technically of a mediation device, an aggregation/processing engine, a monitor application, a report generator and different applications (see appendix).

3.2.1 Definition/Hypothesis

The first step for the Telcos in using the BI Solution is to decide what information is business critical for the organization and thereby should be collected. When the Telcos have defined the information need a hypothesis about how to collect the business critical information must be created. The Solution must then be modified in order to be able to fulfill this hypothesis.

3.2.2 Search/collect

To search for and sort out business critical data from the networks the Solution uses mediation devices. These devices can be resembled with vacuum cleaners. They collect and normalize traffic measurements data from network elements such as switches. There are different kinds of mediation devices. Some devices collect data about the network as a whole while others collect data on a customer/service level. The normalization enables data collection from wireline, wireless and IP¹⁴ networks. The technology of today enables in other words the Telcos to collect data from all kinds of networks. The underlying technology does therefore not constitute any problems for the Telcos in using the BI Solution.

The customer/service data is imported into the billing system via a so-called billing mediation device. The billing system enables the Telcos mainly to invoice their customers. To be able to calculate the costs of and the revenues from the exchange of capacity with other Telcos, network data is also imported into an interconnect system. This can be seen as a billing system for the business between the Telcos. There are several other important sources of input to the BI Solution apart from the network, interconnect and the billing system. These are for example the accounting system, the customer database and the sales support system. Network specific data is for example network and router usage, traffic trends and patterns and the overall network performance. From the billing mediation device usage data (the calling part and the receiving part, the type of service) is collected. From the billing and interconnect system different kinds of revenues are collected. The accounting system contains the cost structure of the Telcos.

Besides the hard parameters described above the business of the Telcos also contains soft parameters such as for example reasons why some deals are won and others are lost. These soft parameters can be collected from the customer contact points of the Telcos such as sales people, customer service/support, partners, suppliers, Internet et cetera. Some of this information is stored in systems such as customer support and sales support systems. It is theoretically possible to feed the soft parameters into the BI Solution. Some information might however have to be collected manually.

¹⁴ IP: Internet protocol. A network layer protocol of TCP/IP responsible for addressing and sending TCP packets over the network.

3.2.3 Analysis

Business critical data from the different sources of input is imported into some kind of aggregation/processing engine. In the engine all the data is processed and coordinated and performance indicators calculated. This aggregation is done through user-definable data models that define how the data should be combined and aggregated in order to create meaningful information. The results of the processing are exported to a database where they are stored. The next part of the solution is the reporting tool and its applications. This allows the user to create, schedule, view and generate his/her own reports based on the aggregated data. It is also possible to define standardized reports. Within the engine there is also a monitor application that issues alarms/events when predefined thresholds are passed.

3.2.4 Dissemination

As the Solution collects information from several sources and different parts of the organization it has many potential users. In our thesis we have focused on three categories of users; Product Managers, Marketing Managers and Sales Managers. There are of course other categories of users such as the CEO, Finance Manager et cetera. The reporting tool is a basic means of accessing the information. With the reporting tool the information is broken down in different reports to support the specific needs of the users. The information thereby becomes meaningful to the users, which is a prerequisite for it to be successfully disseminated. The reports can effectively be disseminated through a web-based user-interface via the Intranets of the Telcos.

3.2.5 Action/Feedback/Redefinition

The BI Solution makes information available to the users and thereby allows them to take better-informed actions faster. These actions must be analyzed and lead to redefinition of the information needs. The redefinition step completes the continuous BI cycle.

4 Creating intelligence with the Business Intelligence Solution

The BI Solution can, according to our theoretical framework in several ways help the Telcos to approach directed scanning and thereby create more intelligent organizations. The Solution supports three different main areas of the business of the Telcos; customer management, product management and operational management. At the general organizational level the main benefit of the Solution is that it can increase the knowledge transfer within the Telcos. Furthermore it also has a positive effect on the transparency and the coordinating logic. The Solution finally also affects the content and the personal flow within the individual's work situation.

4.1 The general organizational situation

4.1.1 Knowledge transfer

The BI Solution increases the knowledge transfer through making business critical information readily available to the relevant decision-makers. Through coordinating data from several sources within the Telcos the BI Solution can create an almost infinite number of different reports. We have chosen to focus on a few central functionalities of the solution. The first is that the Telcos get a better understanding of what causes profitability. The second is that the Telcos are given the capability to better analyze the behavior of the existing customers. Finally we have chosen to describe the alarms/events functionality of the BI Solution. These benefits of the solution are relevant examples of what Telcos can achieve with the technology of today through extracting, coordinating and analyzing information from the different sources of input.

The BI Solution gives the Telcos the opportunity to learn more about their networks, customers and services. The Solution can therefore theoretically contribute to making the Telcos more customer-oriented. It is a fundamental marketing maxim that the more you know about your customers, the more easily you can provide the services that the customers are looking for. The Solution offers the Telcos the ability to better understand the customers' needs and behavior and leverage this understanding to tailor services. Through coordinating data from different sources of inputs and making it available to decision-makers at all levels within the organization the Telcos can create more holistic views of their customers, services and networks. The BI Solution for example enables the decision-makers to view traffic data and profitability in the same picture. The unique thing is that traffic data is made readily available to others than the network department.

4.1.1.1 Functionalities

4.1.1.1.1 Profitability

The BI Solution can produce reports about profitability per service, customer and region. To be able to calculate profitability at a detailed level such as per service and customer, it is however necessary for the Telcos to have a good understanding of their cost structure. To get a more accurate measure of profitability the Telcos must divide the overhead costs upon for example the individual customer. Examples of overhead costs are initial investments in the networks, how often the specific customer contacts customer service/support, marketing expenses et cetera. Every Telco must decide which level of cost division that is optimal. To calculate profitability the cost structure must of course be coordinated with the revenues. This is done automatically by the BI Solution.

The Telcos can use profitability per customer to segment the customers and divide them into different classes. The marketing and the sales department can upon this information try to change the relations with the unprofitable customers before they cause further losses and strengthen the relations with the profitable ones. It is also possible to create VIP segments with the most profitable customers to give them a special treatment. This is a way to minimize churn among the customers that are most profitable to the Telcos. The BI Solution can also enable the Telcos to foresee which customers that will be profitable in the future. Historical data about the customers'

profitability is used to create a linear trend. This makes it possible for the Telcos to keep track of customers that with a certain probability will be profitable in the future.

The product department can use profitability per service to optimize the product portfolio. This department can take the decision to stop selling services that are unprofitable and direct the sales department's efforts to sell the most profitable services. The BI Solution furthermore enables the product department to get an overview of the profitability of the services in relation to their capacity usage. The product department can thereby direct the sales department to sell the one of two services that are equally profitable but that demands less capacity in the networks. This overview enables the product department to better understand how the services within the product portfolio relate.

4.1.1.1.2 Analyze the behavior of the existing customers

The BI Solution also enables the Telcos to analyze their existing customer base in an automated way. Through this analysis it is possible to track trends in customer behavior in order to profile, segment and target the customers with more tailored services. Due to the changing business landscape time to market of services becomes crucial. The BI Solution can help the Telcos reduce the time to market when launching new services. The Solution could for example help the product department to plan and roll out GPRS¹⁵ in the most optimal way. This could be done through identifying and defining the GPRS market based on the existing GSM¹⁶ customer base of the Telcos. The BI Solution could automatically find potential GPRS customers through identifying GSM customers who use their cellular phones for data traffic that is as a modem. Those customers are to be regarded as early adopters and thereby GPRS prospects.

Except for reducing the time to market the Solution can also help the Telcos target the market much more efficiently when launching new services. The marketing department can initially tailor its marketing efforts to the identified prospects. It is also possible to follow up the results of the marketing campaigns through examining the changes in the customers' traffic usage. Furthermore it is possible to create profiles of the existing customers and apply these to new customers. This is a way to identify possible prospects outside the existing customer base when launching a new service. To sum up the pre-launch analysis/service roll out analysis can enhance the likelihood of service success and increase the ability to respond quickly to market changes.

Through examining the existing customers' behavior it is possible for the sales department to spot opportunities to sell added services to them. The BI Solution can for example automatically help the sales department detect when customers are about to reach their capacity limit. This is an opportunity for the sales department to propose an upgrade to those customers. Information about the existing customers' usage behavior can also be used to bundle existing services as well as new services in order to create a service mix that is tailored to the customer.

¹⁵ General Packet Radio System (GPRS) is a packet-based technology, optimized for short, 'bursty' traffic that will theoretically increase data speeds in the mobile networks up to 115kbps.

¹⁶ Global System for Mobile Communications, stood formerly for Groupe Speciale Mobile. Digital cellular telephone standard

4.1.1.1.3 Alarms/events

The BI Solution can automatically make the decision-maker aware of both possibilities and threats within the business. For example can the user define thresholds for the revenues of a specific customer. If this threshold is violated the user of the BI Solution immediately receives an alarm. A reason for the decrease in the customer's revenues might be that the customer has started to turn to another Telco. The user can act upon this alarm and contact the customer before it leaves the Telco. With the BI Solution the user can also for example see when a customer is close to running out of capacity and thereby is ready for a service upgrade. The Telco could then contact the customer to sell extra capacity before the customer itself discovers this need. If the quality of the service offered to the customer is below the quality level agreed upon¹⁷, the BI Solution can send out a SMS/e-mail to for example the sales department. If a network problem has directly impacted on a customer the Solution can automatically notify the billing system that a service level has been violated and the affected customer's bill is automatically reduced.

4.1.1.2 Dissemination

Decision-making based on the analysis of information about the customers, the services and the network is a requirement across all areas of the organization from strategic planning to customer service. Through coordinating data from different sources of inputs and making it instantly available to decision-makers at all levels within the organization the Telcos can create more holistic view of their customers, services and networks. The BI Solution enables the decision-makers to view traffic data and profitability in the same picture. Traffic data is thereby made readily available to others than the network department. When the Solution is used in an optimal way the "right" people get the "right" information in the "right" format at the "right" time.

The users can access the report generator of the Solution through a web interface. Everyone in the organization thereby easily get access to the same information. The user of the Solution can tailor reports through a graphical user interface and thereby access the information that they perceive as relevant. The BI Solution collects information that has been predefined as business critical within the organization (see "The Business Intelligence Cycle"). This forms a framework for the individual as to what information that is seen as business critical. The Solution creates in other words a frame for the individual's perspective making process. However the Solution also gives the individual the capability to elaborate with this information in order to make new conclusions.

The decision-makers often know what information that they want but they seldom know how to get it and they certainly don't know how to forward the information that they think could be of use to others within the organization. The BI Solution makes it possible to create an enterprise-wide view of the business information available in its different sources of input. To sum up the Solution creates a single data source, which ensures a more common view of the customer across all service areas.

¹⁷ SLA: Service Level Agreement

4.1.2 Transparency

The BI Solution increases the transparency of the technical system structure through integrating the isolated systems. If the information is structured department wise it is more clearly visualized what parts of the business the departments are responsible for. This gives the individual the possibility to better understand and get an overview of the physical structure of the company. Through increasing the transparency in these mentioned ways the BI Solution can help to create a more intelligent organization.

4.1.3 Coordinating logic

The BI Solution can for several reasons strengthen the coordinating logic. The Solution improves the information flow within and between the processes of the organization. The individual is thereby given better prerequisites to understand how the processes within the organizational environment relate to his/her enacted environment. This is because the individual with the BI Solution gets instant access to information about his/her environment.

4.2 The individual's work situation

4.2.1 Content

To successfully implement a BI Solution there must be a fit between the Solution and the individual's work situation. A new system will constitute one part of the content of the work situation. The implementation might be a difficult process not just from a technical point of view. Before the BI Solution is in place the individual often relies upon other systems as well as his/her own experience. When a new system appears in his/her work situation the initial response from the individual is either anxiety or that he/she realizes that the system brings new possibilities. The anxiety appears when the system is perceived as just another demand for the individual to cope with.

The changing, complex business landscape of the Telecom industry puts very high demands upon the individual. We claim that the BI Solution can increase the perceived proficiency of the individual. It can in other words work as a tool for the individual to better cope with this complexity. The individual's spontaneous environmental scanning becomes narrower as the Solution contains information that has been predefined as being business critical. However the Solution may draw the individual's attention to opportunities and threats that would otherwise not have been revealed.

4.2.2 Flow

We believe that the individual will perceive the Solution as an enabler rather than just another demand. This leads to a more intense scanning because the individual gets more motivated for the task.

4.2.3 Directed scanning

To sum up the BI Solution can theoretically help the entire Telco to successfully approach directed scanning. Since the individuals will, through the BI Solution, have access to the same information their perspectives will to some extent be overlapping. The result of successfully implementing and using the Solution is a more intelligent

organization, that is an organization with an improved capability to foresee the future, to change its behavior according to the changing conditions in the environment and to act proactively.

5 A model of how the Telcos have developed over time until today

During our interviews we have identified a pattern among the Telcos that indicates how they have developed over time until today. Based on this we have created a model of the Telcos' development. The model is thereby based on people's subjective interpretation of the reality. We have divided the development of the Telcos into four phases with different characteristics (see figure 8). We have chosen to call these phases; "startup", "expansion", "consolidation" and finally "controlled growth". Furthermore we have divided the characteristics of each phase into "organization", "services and customers", "systems/information" and finally "intelligence". In the intelligence part we describe the general organizational situation with the theoretical framework as a starting point. We haven't described the individual's work situation since every work situation is unique.

It is difficult to give one true picture of the Telecom industry. This is because some events in the development of the Telcos are hard to unambiguously assign to the specific phases. This in turn implies that there might be some Telcos that deviate from our description below. We have however in our model tried to generalize in order to be able to describe the different phases as fair as possible.

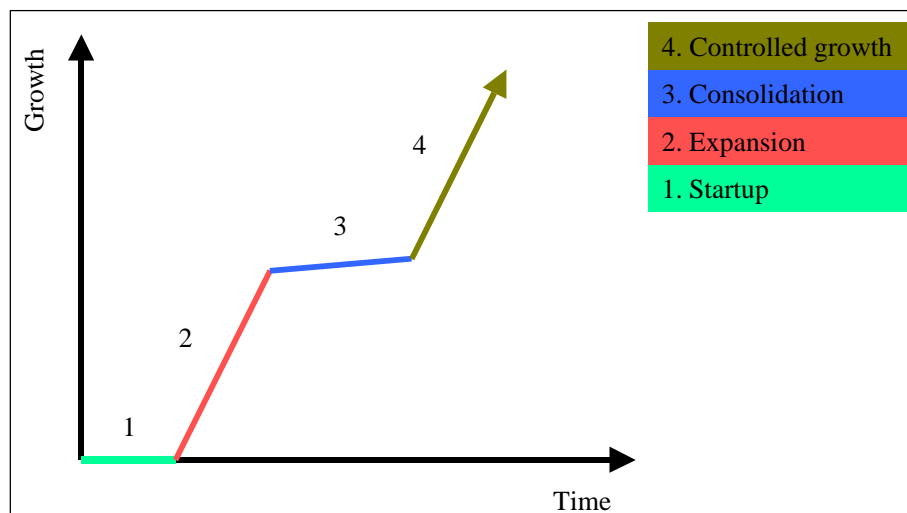


Figure 8. A schematic overview of how the Telcos have developed over time until today

5.1 The different phases

Every Telco must initially go through some kind of start up phase. This phase is followed by an expansion phase. The rapid expansion that takes place in this second phase often creates disorder within the business of the Telcos. A need to slow down in order to go through the business leads the Telcos into the next phase, the

consolidation phase. In this the third phase the Telcos deal with the internal disorder and try to gain a better understanding of their environment. The consolidation creates the necessary prerequisites for entering the fourth phase that we have chosen to call controlled growth. Controlled growth often requires a completely new business model compared to the one used in the start up or the expansion phase. In our model the Telcos become more and more intelligent over time as they develop through the phases. There are at the Swedish Telecom market today examples of Telcos in all of the four described phases. There are however very few examples of Telcos in the controlled growth phase.

The described phases form a continuous process, as the Telcos never stop developing. This is because the business landscape constantly evolves. New technologies emerge over time, which create prerequisites for new services. This in turn might lead to new startups. It might also lead to that the established actors modify their existing business models or that they create and use new business models in parallel with the old ones. One Telco that we interviewed founded a subsidiary specifically for the mobile part of the business. This company had to go through a startup phase within the established organization. This example illustrates that the Telcos can be in different phases at the same time with different parts of their business.

In figure 8 it looks like the consolidation phase is limited in time. This is however not the whole truth as the consolidation process is continuous. It is however varying in its intensity being most intense in the phase that we have chosen to call the consolidation phase. There is a need for the Telcos to continuously consolidate the business in the controlled growth phase. It is also possible that the Telcos will have to go through another more intense consolidation phase after a while, in spite of a period with controlled growth.

5.2 Start up

It is a fact that every company must initially go through some kind of startup phase. In this phase the Telcos get their business up and running and form the basis for expansion.

5.2.1 Organization

5.2.1.1 Entrepreneurial culture

Initially there are a few entrepreneurs starting up the business of the Telcos. These entrepreneurs are willing to take risks and they learn to a large extent by trial and error. They do what they think is necessary to drive the business in the desired direction. Furthermore they don't care too much about the business processes but focus on the overall direction of the Telcos. It is the possibilities that serve as guidelines for the business. The corporate culture is in the startup phase in other words very entrepreneurial.

5.2.1.2 Dependence on experience

As the business logic of the Telecom market is very complex it is necessary for the Telcos to have competent people running the business from the start. Managers and "experts" are therefore often initially hired from established and incumbent Telcos.

One of the Telcos that we interviewed hired in the startup phase its CEO, Finance Manager and Technical Manager from established Telcos. These people bring the corporate cultures of their former employers with them. Sometimes these cultures are not in line with the entrepreneurial culture of the startup. This is due to the different business models, ways of thinking and acting, of the Telcos in the different phases.

5.2.1.3 Lack of structure

In the start up phase the managers dominate the business of the Telcos. Though there are formal titles it is often not clearly defined what person is responsible for exactly what functional area. The business of the Telcos is built around key people rather than key positions and therefore very dependent on these individuals. In this phase the organizational structure is in other words not formalized and the routines and processes of the business are not clearly defined. Several persons interviewed characterized the situation of the Telcos within the start up phase as being creatively chaotic.

5.2.2 Services and customers

5.2.2.1 Build a product portfolio

Before the Telcos can start building a customer base the technical equipment, networks and systems must be in place. This might imply that the Telcos build their own infrastructure or that they hire dedicated capacity from a carrier. Most Telcos choose to use well-known technologies to get the business up and running. Making the technique work is the primary focus in the start up phase and this must be taken care of before the Telcos can start gaining customers. The Telcos focus for natural reasons on developing a basic concept of services. It is to sum up in the start up phase seen as the most important thing to have well functioning networks and services from a technical point of view.

5.2.3 Systems/information

5.2.3.1 Basic business critical systems

From the very beginning the Telcos must implement several business critical systems. One of these is the billing system that must be in place in order to be able to bill the customers. The business of the Telcos also requires an interconnect system so that the Telcos know how much to pay to and get paid from other Telcos when using each other's capacity. Other examples of systems that the Telcos might implement from the beginning are a network management system for surveying the network, a simple accounting system for controlling the financial situation of the Telcos and a simple customer database that will contain the most basic information about the customers. These systems are, as we mentioned, often initially rather simple and therefore have to be developed as the business develops, for example as new services that need to be billed are introduced.

In the startup phase the Telcos have not yet launched any services or started to build a customer base. The Telcos have therefore no information about customer/services embedded in their business critical systems or networks.

5.2.4 Intelligence

5.2.4.1 Transparency

In the startup phase it is easy for the individual to understand the physical structure of the organization. This is because a few individuals make up the organization. The social structure is however not yet well developed, as there are no clear areas of responsibility. When the Telcos are at the beginning of their development the social structure is however of minor importance because there are close personal relations between the few individuals. Finally the policy structure is often deficient, as the policy seldom is clearly formulated at this early stage. Since the organization consists of a few people and the business is not yet up and running, the transparency is in total often quite good.

5.2.4.2 Knowledge transfer

The lack of information about the customers/services in the systems and the networks results in that the decision-makers have to rely upon their own experience and communication with other people. This communication is often ad hoc and informal. However there are yet no internal organized sources of information such as databases. In summary the knowledge transfer is in the startup phase working rather well through communication between a few individuals.

5.2.4.3 Coordinating logic

The Telcos have in the start up only a limited number of rather simple processes. Furthermore each individual's enacted environment makes out a large part of the organizational environment. This implies that it is rather easy for the individual to understand the processes and how they relate to each other. The individual thereby perceives a good fit between the enacted and the organizational environment.

5.3 Expansion

During this phase the Telcos focus narrowly on heavy expansion. This often negatively affects the internal order of the organization. The entrepreneurial spirit that is so typical for the Telcos in the start up phase is also more or less characteristic for the Telcos in the expansion phase.

5.3.1 Organization

5.3.1.1 Need for flexible leadership

As we mentioned before the whole business initially circles around key persons. The managers have, especially in the start up phase but also in the expansion phase, a very central roll in pointing out the direction of the business. The leadership in the expansion phase is characterized by a combination of roughly structuring the business and an entrepreneurial spirit with great visions for the company. The managers must therefore be flexible in their leadership.

5.3.1.2 Heavy recruiting

In the expansion phase the Telcos experience rapid growth and thereby an urgent need for recruiting a lot of people. It is a challenge for the Telcos to hire the right people

and to make them fit into the fast expanding organization with its specific corporate culture. We found during our interviews that there are in the expansion phase often groups of people formed within the Telcos with different mentalities due to different corporate backgrounds. There are also, as well as in later phases, different groups of people within the Telcos based on professions (marketers, sales people, product people et cetera). This implies that conflicts easily arise and it might be difficult to make the individuals work in the same direction.

5.3.1.3 Basic structuration

At the beginning of the expansion phase the Telcos are often still very dependent on key people. The whole business circles around a few individuals. Due to the heavy expansion and recruiting it is impossible for the Telcos to go on doing business in an informal way. The Telcos are sooner or later forced to form a basic organizational structure with different departments that have different functionalities. At the same time the formal positions and areas of responsibilities become more clearly defined. There is in other words a basic “structuration effect” taking place which is a necessary prerequisite for further heavy expansion. This structuration is in accordance with our theoretical framework.

During our interviews we have seen that it is however difficult for the Telcos to maintain the basic structure during the heavy expansion that follows. The result of the heavy expansion is often internal disorder. This is partly because dealing with the internal situation is seldom prioritized in the expansion phase. The coordination and the communication between the different departments often suffer. One Marketing Manager said that the informal discussions between sales and marketing people at his company took place only on the initiative from people on the marketing side. If the marketing people didn't take these initiatives they would have been almost completely isolated from the customer information flow. Another example of the lack of coordination between the different departments was a Marketing Manager receiving information about traffic volumes from the CEO who in turn got this information from the Network Manager. As the Telcos in the expansion phase grow in a more or less uncontrolled way the need for consolidation becomes more and more obvious over time.

5.3.2 Services and customers

5.3.2.1 Entering low in the value chain

We have during our interviews seen that it is natural for the small Telcos to start at a low level in the value chain. The services offered to the customers are initially simple and generic such as for example fixed telephony. The Telcos also have to focus on relatively small customers in the earlier stages of the expansion phase. This is because small Telcos don't have the resources, the reputation or the competence to offer services to bigger corporate customers. As the transparency of the market is high at the lower end of the value chain it is difficult for the Telcos to differentiate themselves. The Telcos have therefore at the earlier stages of the expansion phase often a strategy based on aggressive pricing, market skimming and fast delivery of the services.

In the earlier stages of the expansion phase most Telcos focus on gaining as many new small customers as possible as fast as possible. The focus is in other words often on gaining any market shares rather than gaining the “right” market shares. The fact that the Telcos often prioritize revenues rather than profitability result in that many of them have a lot of unprofitable customers. The small customers that the Telcos catch tend to easily change between operators resulting in customer churn. This negatively affects the profitability of the Telcos. Some services however demand that the customers sign contracts for a certain period of time. Many Telcos are in the expansion phase short sighted in relying on these contracts to keep the customers. When the contract period ends the customers are free to choose another Telco which might lead to customer churn.

As the Telcos during their expansion are so narrowly focusing on gaining market shares and the resources such as time and money are scarce the Telcos are bad at nurturing the relations to the existing customers. In the expansion phase the Telcos don't know their small customers very well. The customers are therefore only segmented in an informal way. The insufficient segmentation leads to that marketing campaigns are very broad and not directed towards any special customer segments. The business of the Telcos is in the expansion phase in other words very often characterized by mass marketing. Many Telcos team up with partners and retailers that have existing customer bases in order to more cost efficiently cover the market.

5.3.2.2 Start climbing the value chain

Since the margins are low and the prize competition tough at the lower levels in the value chain, the Telcos often introduce new services and start to climb the value chain at a later stage in the expansion phase. As the Telcos expand over time they develop their ability to serve bigger customers. Broadening the product portfolio is a way for the Telcos to attract more and at the same time bigger customers. Through climbing the value chain the Telcos also try to differentiate themselves from the competitors in the eyes of the customers. When the Telcos grow and climb the value chain it becomes more difficult to overview their business, for example the services offered to the customers. There is therefore a limit to how high the Telcos can climb in the value chain without consolidating. During the expansion phase the Telcos have better relations with bigger corporate customers compared to the smaller customers. The Telcos often have personal contacts with their corporate customers through their sales people. These personal contacts are the main sources of information about these customers. The sales people have a lot of tacit knowledge about their customers. They know for example what the buying centers of the customers look like, what affairs that are won or lost and why, what the relationships with the customers look like et cetera.

5.3.3 Systems/information

5.3.3.1 Chaotic system structure

In the expansion phase the Telcos have more systems that at the same time often are more advanced than in the startup phase. When the Telcos grow the amount of information extracted from their daily processes literally explodes. This information has to be imported into different systems in order for the Telcos to be able to handle their operations. As the Telcos due to the heavy expansion have to focus on the daily

operations the information is often stored in the different systems in an unstructured way.

The systems are furthermore more or less isolated from each other. There are several reasons to why the system structure looks like this. As mentioned before the Telcos develop rapidly in the expansion phase. To be able to manage the daily operations the Telcos implement systems with short notice in the expansion phase. During our interviews we have seen that the Telcos seldom have a long-term strategy for the entire system architecture. During the expansion phase the different departments of the Telcos are not so well coordinated. Each department often decides what systems that are necessary for its specific operations. This clearly has a negative effect on the system structure as a whole within the Telcos. If for example the sales department needs a sales support system it is often implemented without taking the other systems into account. This results in that the Telcos after some time in the expansion phase are stuck with systems that don't communicate with each other. There is in other words in the expansion phase very seldom any kind of database where data is coordinated from different sources of input.

The fact that the systems are isolated, and that there seldom is a structured way of importing information into the systems, affects the homogeneity of the information within the systems. The Telcos seldom import the information about the customers from the contact points into the relevant systems. There is furthermore often overlapping information within the different systems and the users/decision-makers therefore often get several different truths about the customers and services. As the systems are isolated there is a lot of manual work involved in combining data from different sources of input and producing reports. Since the systems are not easy to extract reports from it often takes specialists to do this. The decision-makers are therefore dependent on system specialists to get the written reports that they need. One difficulty in combining data is the overlapping information within the different systems. As we mentioned before the users therefore often get several different truths about the customers. During our interviews we have seen that the Telcos in the expansion phase start to use the billing system in a more strategic way producing reports from it. The Telcos come however to a point where they find out that there is not enough information in the billing system to make all the necessary business critical decisions. The Telcos experience a need for the capability to coordinate information from different sources.

5.3.3.2 *Manual analysis*

In the expansion phase it takes a lot of manual work for the Telcos to process the information that is available in the internal isolated systems and networks. The Telcos are however able to calculate revenue per customer and service in an automated way. The information about the revenues is simple to extract from the billing system. We have seen several examples of Telcos that focus on the customers that generate the highest revenues. The revenues are used as a way to control the status of the customers. Many Telcos also estimate in a manual way the profitability per customer before signing contracts with the bigger corporate customers. The Telcos however seldom conduct a follow up on this profitability. For example they seldom examine what capacity the specific customer uses in praxis during the contract period. The Telcos can't however at this stage in their development calculate profitability per service or customer in an automated way. This is because the systems are isolated and

the Telcos have not yet achieved a firm control over their cost structure. One person interviewed said that the cost structure was like a black hole and that his company was in great need of ABC calculation.

There is also a lot of manual work involved when the Telcos analyze the behavior of customers based on the information contained in the internal systems and networks. One marketing manager commented upon the situation saying that much of the information that would be useful in launching new services is not available to the decision-makers. It is for example difficult to know where to launch new services geographically. The information is not collected, sorted and presented in a suitable way. Marketing campaigns are, if at all, followed up manually through looking at fluctuations in revenues.

While it is difficult to extract the necessary information from the different internal systems the Telcos often turn to external suppliers of information. Many Telcos buy information about the customers from public registers. Furthermore they also order market researches from professional agencies such as Dun & Bradstreet. Some of this information would of course add extra value even if the Telcos could make use of the information available in the internal systems and the networks. Through manual coordination of own information and external registers customer profiles are created. Finally we saw examples of Telcos in this phase that tried to act proactively though their decision-making to a large extent was based on manual analysis. The Telcos for example launched marketing campaigns when the revenues decreased in order to prevent further customer churn.

5.3.4 Intelligence

5.3.4.1 Transparency

At the earlier stages of the expansion phase the Telcos are still rather small. It is however not easy for the individual to look through the organization because there are no formal departments or clear delimitations of the areas of responsibility. As the Telcos expand a basic structuration of the organization takes place which has a positive effect on both the physical and the social structure. In spite of this the internal disorder increases over time during the rapid expansion. This is because the departments that are formed focus on their part of the business and their operations are not clearly coordinated. Furthermore a lot of people are being recruited during the heavy expansion. Both the social and the physical transparency are therefore to be regarded as deficient at the later stages of the expansion phase.

5.3.4.2 Knowledge transfer

It is in the expansion phase very difficult for the individual to know where to find the information relevant for his/her task. This is due to both the insufficient system structure and the disorder within the organization. The decision-makers therefore to a great extent have to rely upon own experience, their personal informal and external sources of information. The fact that there is often unstructured and even overlapping information embedded in the different systems negatively affects the perspective making process of the individual within the organization. As the individuals may create different perspectives about the same parts of the environment this might cause confusion. The internal organizational disorder makes it difficult for the individual to

overview to what people the information should be forwarded. The internal confusion hampers in other words the internal communication. When the Telcos expand the knowledge transfer is negatively affected to such an extent that the situation finally becomes unbearable.

5.3.4.3 *Coordinating logic*

In the expansion phase the organization grows rapidly and the complexity of the business thereby increases. It is difficult for the individual to keep up to date with these changes. As the Telcos expand the chain from order to delivery and operation of services becomes long and complex. Another thing that makes the situation even more complex is that there are different departments responsible for different parts of the chain. On top of this there are also many external actors involved in the production. The large number of processes making up the chain makes it very complex for the individual to overview. From every process the Telcos must collect and store a lot of information in order to be able to run the daily operations. The systems where the information is stored are often isolated and contain at the same time different views/definitions of the customer. On top of this the environment of the Telcos changes continuously and rapidly. The Telcos must adapt to these changes, which implies that the processes change accordingly. This makes it difficult for the individual to form expectations about what the processes look like today and in the future. In total it is nearly impossible for the individual to get the full picture of the whole flow of processes within the Telcos. The result of this is that the individual finds it hard to understand how the organizational environment relates to his/her enacted environment.

5.4 Consolidation

In the consolidation phase the business of the Telcos is guided by the need for profitability. There are many reasons to why the Telcos consolidate. High customer churn and having non profitable customers arise the demand for consolidation from direct owners and investors. Another reason is the need for many Telcos to adapt their business models to the changing business landscape described in the background of this thesis. Furthermore the complexity of the business of the Telcos increases during the fast expansion. The Telcos come finally to a point where it is nearly impossible to overview and control the business. Too high costs due to heavy investments creates an urgent need for the Telcos to understand their cost structure and get into control of the cost situation. The need for creating a more intelligent business therefore becomes more and more obvious during the expansion phase. To achieve controlled growth the Telcos first have to deal with the internal situation and learn more about their environment. This requires that the Telcos slow down their expansion in order to analyze their situation.

5.4.1 Organization

5.4.1.1 *Thorough structuration*

In the consolidation phase the Telcos need to look over their way of doing business, that is to look over routines, processes and the organizational structure. In this phase the Telcos focus on defining and developing their core business and create a homogenous company. Consolidation often implies a thorough structuration of the

Telcos in order to make them more efficient in doing the business they have decided upon. During the consolidation phase the number of employees is unchanged or might even decrease, as there is often a need to cut too high costs.

5.4.1.2 *Changed leadership*

In the consolidation phase the entrepreneurs leave the company and are replaced with people who are better at dealing with the new business situation. We have seen examples of Telcos where the entrepreneurial CEO were replaced by leaders thought to be better suited for stabilizing the business and thereby creating the necessary prerequisites for future controlled growth. When a new CEO is hired he/she often reorganizes the business according to his/her own ideas and visions. Other decision-makers than the CEO are also often replaced in the consolidation phase. One Telco that we interviewed searched all over the world within the group of companies for a Finance Manager that could deal with the more and more alarming cost situation at the end of the expansion phase. As the Telcos develop over time a larger percentage of the managers are recruited internally. At the same time several managers leave the Telcos for other companies. The Telcos develop from companies recruiting managers to plant schools for managers.

5.4.2 Services and customers

5.4.2.1 *Increased customer orientation*

In connection with the efforts to gain control over the internal part of the business the Telcos to a greater extent direct their attention towards the external environment. During our interviews we have identified a clear trend that the Telcos are becoming increasingly customer oriented as described in the background. According to several persons interviewed it seems common that the Telcos run their business until the lack of information about the customers risks to affect the quality of the services delivered to the customers.

When the Telcos expand and climb the value chain the complexity of its product portfolio increases. Higher up in the value chain it is more expensive for the Telcos to gain new customers. It is also a common fact that as the customer base increases so does customer churn. Furthermore the margins are higher and the price elasticity lower when selling to existing customers. This makes it more important for the Telcos to better understand and to have closer relations with the customers in order to fight churn. During our interviews we have seen that many Telcos in the consolidation phase initiate some kind of Customer Relationship Management (CRM) project. The purpose of these projects is to get to know the customers and build relations to those customers that are profitable to the Telcos. The Telcos thereby begin to focus on profitability rather than revenues. The Telcos never cease to go for new customers but in the consolidation phase this is not the primary focus.

In the later stage of the consolidation phase the Telcos have dealt with the internal disorder. The Telcos have furthermore a clearly defined product portfolio and are established actors on the market with established customer bases. The Telcos have in other words created the necessary prerequisites for controlled growth.

5.4.3 Systems/information

5.4.3.1 Cleaning up

In the consolidation phase the Telcos clean up among the systems. The reason to this is that many systems were bought at points in time where the business situation was completely different. This implies that many of the systems are not suitable for supporting the business of today as the business landscape has changed completely during the expansion phase. The systems have furthermore been bought at times when the business situation has become precarious. The reason to this is scarce resources such as time and that it is very difficult for the Telcos to overview what system structure is required to effectively support the business in the future.

5.4.3.2 Integrating

During the consolidation phase the Telcos initiate the process of integrating the business critical systems. A prerequisite for the integration is that central parameters of the information are defined the same way in the different systems. It is for example of vital importance that the parameter “customer” is defined in exactly the same way in all the systems. Most Telcos come in the consolidation phase to the conclusion that several of their business critical systems must be replaced before they are integrated. Furthermore many Telcos try to structure the information contained in the different systems. This implies for example that the information that is not regarded as being business critical is sorted out. We have only seen a few examples of Telcos that have managed to integrate most of their business critical systems. Those Telcos use some kind of data warehouse¹⁸ to store the huge amount of information.

5.4.3.3 Mapping out the cost structure

Furthermore the Telcos start in the consolidation phase to map out their cost structure. This is as mentioned before a prerequisite for calculating profitability per customer or service. Mapping out the cost structure is a complex process since the overhead costs are very difficult to divide upon specific customers and services. In the consolidation phase the Telcos have not fully divided the overhead costs. The Telcos use more or less stereotyped rules for the cost division.

5.4.3.4 More automated analysis

Through cleaning up among the systems, integrating them, structuring the information and mapping out the cost structure the Telcos create prerequisites for calculating profitability in a more automated way. We have during our interviews seen examples of Telcos in the consolidation phase that are able to calculate profitability per service in an automated way. These Telcos however differ in their degree of cost division. The next step for the Telcos is to try to calculate profitability per customer. Calculating this measure requires a more detailed cost than with the services. After the consolidation the Telcos also have an improved ability to automatically analyze the behavior of customers based on the information contained in the internal systems and networks.

¹⁸ Data warehouse: A very large database designed for fast processing of queries, projections, and data summaries, normally used by a large organization.

5.4.4 Intelligence

5.4.4.1 Transparency

As the Telcos during the consolidation look over their routines, processes and organizational structure the physical transparency is dramatically improved. The Telcos define their core business, which leads to an improved policy transparency. Furthermore the roles and areas of responsibility become more clearly stated which increases the social transparency.

5.4.4.2 Knowledge transfer

As the physical, social and policy transparency increase, the internal communication is eased. The cleaning up among the systems, the integration of most of the remaining system and finally the structuration of the information contained in those systems improve the prerequisites for knowledge transfer.

5.4.4.3 Coordinating logic

The increased transparency and knowledge transfer strengthens the coordinating logic. The consolidation of the system structure makes it easier for the individual to apprehend more information from the different processes. It is thereby easier for the individual to understand how the processes within the organizational environment fit with those of his/her enacted environment. The confusion caused by the internal disorder and the systems in isolation is reduced through consolidation. It is for example possible to create a more common view of the customers and services among the individuals within the Telcos. Through the consolidation process where the Telcos look over their business the individuals learn more about the processes and how they relate to each other. During our interviews we have however seen that, as the Telecom business is so complex, it is anyhow difficult for the individual to fully understand how his/her enacted environment relates to the organizational environment.

5.5 Controlled growth

The consolidation phase has led to better internal order and that the Telcos have better prerequisites for understanding their environments. In this phase the Telcos have defined their core businesses and decided upon positions at the market. Altogether this allows the Telcos to grow in a more controlled way than in the expansion phase. The consolidation has created a more widespread awareness among the individuals of the importance of growing in a controlled way. This awareness results in that the consolidation process is continuously carried out in parallel with the further expansion but with decreased intensity.

5.5.1 Organization

5.5.1.1 Continuous fine-tuning

In the controlled growth phase there is continuity in the business and the strategy is carried out over and over again. The new and more clearly defined organizational structure formed during the consolidation phase supports the controlled growth. Through the continuous consolidation the organizational structure, routines and processes are fine adjusted to the ever-changing business landscape of the Telcos.

5.5.2 Services and customers

5.5.2.1 Optimizing the service portfolio

As mentioned before most of the Telcos that enter this phase can measure profitability per service in an automated way. The more clearly mapped out cost structures of the services enable the Telcos to better overview and understand their service portfolios. This understanding makes it possible for the Telcos to optimize the portfolios, that is to quit services that are unprofitable.

5.5.2.2 Better customer relations

During the expansion phase the Telcos focus on building customer bases. In the controlled growth phase the Telcos start to primarily focus on their existing customer bases. The Telcos try to identify the most profitable segments/clusters of customers. The next step is to build and nurture the relations to these profitable customers. We have seen that many Telcos have VIP customers, that is customers that generate the highest profitability or customers that are important to the Telcos in other ways for example as reference customers. The Telcos try to treat the customers in a more individual way through defining different customer segments. The mass marketing in the start up and the expansion phases is replaced by a strive towards one-to-one marketing. The Telcos aim at selling bundled and complementary services to the “selected” customers. The capability to more efficiently bundle services is a result of the better understanding of the service portfolio achieved during the consolidation phase.

5.5.2.3 Gaining the “right” market shares

In the controlled growth phase the Telcos of course also look for new customers even though this isn't the primary focus. In this phase the Telcos have better prerequisites for gaining the “right” market shares instead of just gaining any market shares as fast as possible. This means that the Telcos choose new customers more selectively. The Telcos aim to focus on new customers that are profitable to the company rather than those who just generate high revenues.

5.5.3 Systems/information

5.5.3.1 Strive towards optimal integration

As said before very few Telcos manage to optimally integrate all the business critical systems during the consolidation phase. The Telcos therefore have to work continuously with the integration of the different systems in the controlled growth phase. The Telcos strive in the controlled growth phase towards optimal integration of the systems in order to get a more holistic picture of the customers and services.

5.5.4 Intelligence

5.5.4.1 Transparency

When the Telcos expand this normally threatens to negatively affect the transparency. However the consolidation phase has hopefully created prerequisites for expansion

with sustained transparency. The continuous fine-tuning of the business might even lead to increased transparency.

5.5.4.2 Knowledge transfer

As the Telcos strive towards optimal integration of the systems the prerequisites for knowledge transfer are gradually improved. As the Telcos also strive to further integrate the different parts of the organization this also affects the knowledge transfer positively.

5.5.4.3 Coordinating logic

The increased transparency and the improved prerequisites for knowledge transfer strengthen the coordinating logic. As the Telcos have well-defined processes it might be possible for them to grow with sustained or even increased coordinating logic.

6 Factors affecting our model of how the Telcos have developed over time until today

During our interviews we have identified a number of factors that can affect how fast the Telcos develop over time. From our model described in section 5 it should be clear that the Telcos become more intelligent as they develop over time. This section can help to explain why some Telcos are more intelligent than others are though they have been on the Telecom market for the same number of years. The factors that we have identified can have a positive or/and a negative effect on the development of the Telcos towards more intelligent organizations. As our study has been limited in time we haven't been able to observe that the described effects actually occur. Finally it is very difficult to draw conclusions about the net effect of the factors that at the same time have both a positive and a negative effect.

6.1 Owner/s

6.1.1 Owner/s support

The owner/s of the Telcos can for several reasons have a very positive effect on the development of the Telcos. Some owners influence the business of the Telcos more than others do. If the owner has good insight into the Telecom industry and in the specific business of the Telco the probability for successful support is higher. Some owners that are only financiers might not have this insight and they therefore tend to let the Telcos operate more freely. When having a strong Telco as an owner the Telcos can get access to business critical resources such as personnel, experience, capital and technology from the very beginning of their development.

As we described in the background the business landscape is becoming increasingly global. Many global Telcos are being established at the Swedish market. The subsidiaries of those global groups of companies enjoy several advantages in their development. Some global Telcos use a global strategy that we have chosen to call a "McDonald's concept". This concept implies that a new subsidiary develops according to a, by the parent company, predefined structure. This strategy is used in order to gain synergetic effects within the group of companies. One group of

companies that we interviewed had centralized all the basic systems such as for example billing. The subsidiary in Sweden could thereby faster get the business up and running by connecting to the central systems. The global Telcos also use this system strategy in order to standardize the global system structure to such a large extent as possible. As the system structure is standardized the internal communication and the group of companies' overview of the entirety is improved. The McDonald's concept might also include standardization of organizational structure, routines, processes et cetera, which can speed up the development of the subsidiary. With the support from the group of companies the Telcos can enter higher up in the value chain than would otherwise have been possible. The Telcos do furthermore not have to build a reputation of their own to the same extent as Telcos not belonging to established groups of companies. On the other hand the company name could be a handicap for the Telcos if their business is not in line with the rest of the group of companies.

The global Telcos often have global customers. These customers may have subsidiaries in Sweden that the local Telcos more easily can attract and gain. This is because there are often many advantages for the global customer to have as few suppliers as possible. This decreases the need for the Telcos to build a customer base of their own, which speeds up their development over time. To sum up the support that the Telcos get from the group of companies gives them better prerequisites to start thinking about how to create intelligent organizations at an earlier point in time.

It is not only within global groups of companies that more mature parts can support the other parts with business critical resources. As mentioned before Telcos can, with different parts of their business, be in more than one phase at the same time. A new division that starts up within the established business can gain many advantages as well. How big the gap is between the new part of the business and the established decides to what extent the business critical resources can be used.

As described above the owner/s support might have a positive effect on the development of the Telcos. We have however during our interviews also identified several ways in which the owner/s efforts to support might have a negative effect on the development of the Telcos towards more intelligent organizations. If the Telcos have more than one owner the decision process becomes more complex and it might be difficult for the owners to agree upon a common strategy. One person interviewed claimed that the trend of today with horizontal integration will come to an end since a situation with several owners that have different corporate cultures is not a viable option if the Telcos are to survive in the fierce global competition.

During our interviews we saw examples of parent companies trying to push standardized services, systems and organizational structure upon the subsidiaries. This McDonald's concept often causes problems for three reasons. The first reason is that "business is local", that is markets in different countries differ in spite of the globalization. If there is a lack of understanding of this at the parent company this might obstruct the development of the local Telcos. In some groups of companies new services are centrally developed, far from the local markets. One interviewed Telco got all its services from its parent company instead of developing its own services according to the needs of the customers on the local market. This led naturally to a

product-oriented business rather than a market-oriented business focusing on the customers' needs.

The second reason why a McDonald's concept often causes problems is that the business logic differs between the four phases described in our model. In one case during our interviews the parent company was in the consolidation phase while one of its subsidiaries was in the start up phase. The parent company treated the subsidiary as if it had come much further in its development than was actually the case. The third reason is that the subsidiaries often are not equally developed. Some subsidiaries are well ahead of the systems implementation pace in their development while in the extreme situation others don't even have an existing customer base to analyze with the systems. Through the standardization process the subsidiaries' ability to influence when systems are implemented are limited. This hampers the further development of the subsidiaries that are at the front edge within the group of companies. One interviewed Telco had been waiting for almost a year on a new more advanced billing system. We have seen examples of the most developed subsidiaries becoming impatient and therefore buying their own systems before the systems are implemented all over the group of companies. These systems are however often modified meanwhile resulting in that the subsidiaries are stuck with them.

There might finally believe it or not sometimes be a backside of having financially strong owner/s. We have during our interviews heard examples of financially strong Telcos that expanded to a point past the optimal before starting to consolidate their business. The financially strong Telcos might also focus on revenues rather than profitability therefore not prioritize efficiency of the business.

6.1.2 Owner/s demands

We have seen that some owners (especially American) have a very strict control and therefore demand very detailed reports from the Telcos at an early stage in their development. This forces the Telcos to get in control of business critical measures which may lead to an earlier implementation of systems than would otherwise have been the case. Furthermore Telcos that are listed at a stock market are forced to go through and get into control over their information situation in order to produce the reports required. As mentioned in the beginning of our thesis the valuation of the Telcos is changing due to the changing business landscape. The demands that the Telcos face today are in other words different from before. It takes a more intelligent organization to be able to focus on profitability of customers and services rather than just revenues.

Owner/s demands might also have negative effects on the development of the Telcos. The Telcos tend to prioritize what they are evaluated on by the owner/s. If the owners are very influential and for example demand further expansion, it might be hard for the Telcos to consolidate their business. Another example is that some owners have been narrowly focusing on increasing the market value of the Telcos, which as we described in the background until recently was decided by turnover rather than profitability. This more or less forces the Telcos to have the same focus as the owner/s, that is on generating revenues and customer. Furthermore, as mentioned before, some owners have very hard demands on reporting of key financial measurements. This might lead to that the Telcos focus too narrowly on extracting this particular kind of information.

6.2 Corporate culture

The corporate culture has a big impact on how intelligent Telcos can be. The corporate culture consists of three parts; vision, mission and values.¹⁹ Vision is what the company wants to fulfill, mission is the unique task of the company that motivates its existence and values are what the company is and should be, in other words what is seen as important to the company. If these three parts of the corporate culture are clearly formulated and disseminated throughout the organization the policy transparency is good. It is of vital importance to create a culture that is advantageous for the creation of an intelligent organization.

We have during our interviews seen that the Telcos differ very much in their corporate cultures. Some Telcos have a market-oriented rather than a technology-oriented cultures. We have seen that the corporate culture affects the status of the marketing department. A clear indication of its status is whether or not the marketing manager is a member of the board of directors. If the marketing function has high status this often positively affects the understanding of the Telcos for the value of creating intelligence. We have seen that if the Telcos are too narrowly focusing on the technology issues this may result in that the marketing department does not get the resources needed to do a good job. As the department can't carry out its task in a satisfying way it is perceived as not so important to the business of the Telcos. We have seen examples of Telcos where this has become an evil circle that has been hard to interrupt. There is thereby a risk that the Telcos don't fully make use of the valuable customer and service information.

The corporate culture also affects the systems implementation process. Our interviews indicate that at technology oriented Telcos it is often the IT-department that owns and puts demands upon the systems. At Telcos with a more market oriented culture it is more often the users such as market and sales people that own the systems. The role of the IT-department is here reduced to implement and run the systems asked for by the users. In the latter case there are better prerequisites for the systems to be used in order to create a more intelligent organization. One person interviewed commented upon the importance of the corporate culture for the systems implementation process in the following way: "If the corporate culture is characterized by a true focus on the customer, the company understands the value of implementing a system that supports customer orientation". Another person interviewed said: "It is the organizational mindset that decides what systems that are implemented when".

Finally the corporate culture can affect how the Telcos make use of their scarce resources. Financial strength is of course, as we have mentioned before, important for how fast the Telcos can develop over time becoming more intelligent organizations. Capital is for example important as it costs a lot to buy and implement BI solutions. Capital in itself is however not enough to create an intelligent organization but it can ease and speed up the process. The Telcos must also be aware of the value of creating a more intelligent business.

¹⁹ Garberg, Göran, lecture at Stockholm School of Economics, 07/12/00.

6.3 Corporate strategy

The corporate strategy is closely related to the corporate culture. We define strategy as the company's plan for how to achieve its vision over time. The Telcos have, through choosing different corporate strategies, decided differently upon how to prioritize with the scarce resources.

During our interviews we have seen that the historical strategy of the Telcos to a large extent decides their future. A Telco can expand through organic growth, mergers or acquisitions. Through acquisitions and mergers the Telcos can get access to an existing customer base and experience of other Telcos. If expansion is achieved through acquisitions the result might however be Telcos with several different cultures, organizational structures and systems. The process of integrating the companies is very complex and it is quite common that they operate in isolation in parallel with each other. Standardizing the systems is often much more complicated if the Telcos have grown through acquisitions rather than organically. One person interviewed said that "what systems you will implement in the future very much depends on what systems that you have invested in the past, that is what system you have today.

We have also seen examples of Telcos that sell through partners in order to reach the desired customers and to make use of the partners' experience about the customers and services. Our interviews indicate that many Telcos would like to better make use of their partner-webs to achieve these advantages. Teaming up with intelligent partners can to sum up have a positive effect on the intelligence of the Telcos.

6.4 Individuals

According to our interviews specific individuals can have a great effect on the creation of intelligence within Telcos. There is as described before a large turnover of employees between different Telcos. As we also have described the Telcos at the Swedish market are in different phases in their development. Telcos in the startup and expansion phase often hire experienced managers from more mature Telcos. These individuals may through their experience and insight into the value of creating intelligence positively influence the development of the Telcos. It is therefore very important for the Telcos to be able to recruit the right people, especially key managers. The existence of a person, it might be the CEO or another influential person within the organization, who sees it as his/her mission to create an intelligent business is very important for the development of the Telcos. These kinds of persons' mentality often affect the whole organization. One person interviewed said that if there is a strong leader who is good at communicating his visions and strategy, who knows the market well and has a symbolic value in his own, this can really speed up the development of the Telcos over time.

6.5 Shifting organizational structure

During our interviews we have heard about Telcos that go through different phases of centralization and decentralization in a cyclical process according to trends in how to organize a company. According to one person interviewed the shifts between

centralization and decentralization has had a negative impact on the company's efforts to create a more intelligent business. One reason to this was that the Telcos couldn't adapt their systems fast enough according to the change in the organizational model. Furthermore the changes between decentralization and centralization make it difficult for the individual to overview the processes and how they relate to each other. The coordinating logic is in other words impaired, which in turn negatively affects the creation of intelligence within the organization.

7 Creating intelligence with the Business Intelligence Solution in praxis

Earlier we have described how the BI Solution according to the theoretical framework of this thesis ideally can help the Telcos to create more intelligent organizations. In this section we put the BI Solution into a real context. We thereby use our model of how the Telcos have developed over time as a starting point. First of all we discuss the ability of the Telcos to make use of the BI Solution. We then conclude this thesis by discussing why the Telcos wouldn't become equally intelligent by implementing the BI Solution.

7.1 Ability to make use of the Business Intelligence Solution

7.1.1 Abilities developed over time

We have in the picture below summarized the abilities that Telcos, according to our model, develop over time (see picture 9). In the start up phase the Telcos have to focus on getting the business up and running and developing their ability to deliver services to the customers. During the expansion phase the Telcos focus on developing their ability to sell in order to expand their customer bases. In the consolidation phase the Telcos develop their ability to do business, that is to sell in a more selective and profitable way. Through consolidation the Telcos also create the necessary prerequisites for developing the ability to enchant the customers, that is to build long-lasting relations to them. In the controlled growth the Telcos develop and make use of this ability. The Telcos finally come to a point in their development where they have the ability to offer valuable information about the customers to other actors. It is for example possible for the Telcos to sell information to e-commerce companies' about their customers. This will probably be an important source of income for the Telcos in the future. Several persons interviewed claim that many Telcos in the future will become pure knowledge enterprises.

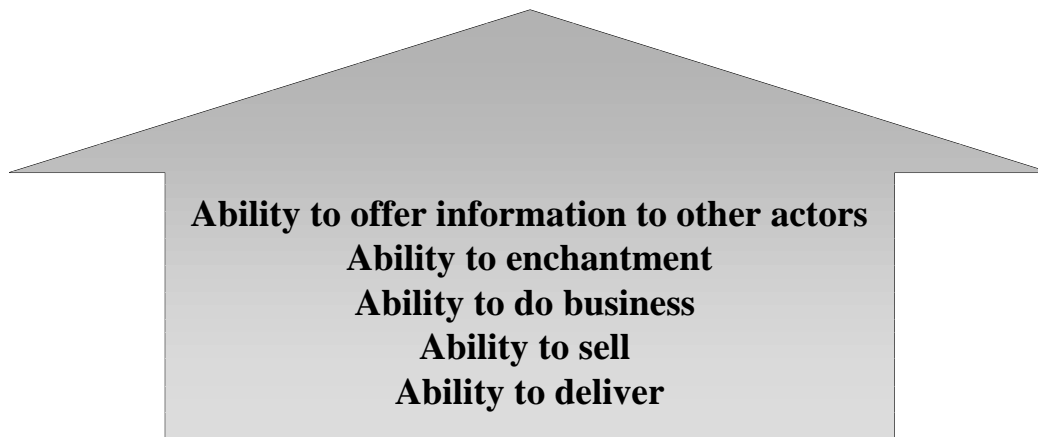


Figure 9. Different abilities developed over time

7.1.2 Changing prerequisites for development

Our model of how Telcos have developed over time until today is not completely viable for describing the development of the Telcos in the future. This is because the model describes a time period when the Telecom industry went through an extreme development as a result of that its entry barriers were torn down through the deregulation. The barriers to entry have for several reasons started to increase again. It will probably be difficult for new Telcos to enter low in the value chain offering basic generic services. The reason to this is that the margins of those kinds of services are already today very squeezed. Furthermore the customers are to a greater extent demanding total communications solutions. Emerging technologies will however probably make room for the development of new startups.

Today the Swedish Telecom market is characterized by fierce rivalry due to the large number of actors. The number of actors at the Swedish Telecom market will however probably decrease through mergers and acquisitions and a number of global groups of companies will dominate the global arena. These actors will have the capabilities to offer total communications solutions at relatively low costs due to economies of scale. Altogether this decreases the room for the kind of heavy expansion described earlier in our model.

7.1.3 Recommendations

Due to the changing business landscape we claim that it will be necessary for the Telcos to start creating more intelligent organizations at an earlier point in time in their development than has been the case up till now. In the expansion phase the amount of business critical information literally explodes as the customer base grows. We therefore believe that implementing the BI Solution at an early stage in the development of the Telcos would mean a great advantage to them. It might however not be a good idea to implement the Solution too early since it should be the operations that put demands upon the Solution and not the reverse.

Our model of how the Telcos have developed over time shows that the Telcos have in the different phases different prerequisites for implementing and creating intelligence with the BI Solution. The model indicates that it is, for several reasons, difficult for the Telcos to fully implement the BI Solution at an early stage. Creating an intelligent organization is a process that must be carried out step by step and that requires a lot of

time and other resources. As the resources often are scarce the Telcos have to prioritize in how to make use of them. As previously described the Telcos over time develop certain abilities. We believe that Telcos also in the future will have to develop the abilities to deliver and sell before they can start focusing on creating more intelligent organizations.

We however believe that it will be necessary to develop the ability to do business and to enchant the customers at an earlier point in time. We recommend that the Telcos should think big but act small from the very beginning. Through our interviews we have found out that it is very important to, as far as it is possible, have a long-term strategy set from the very beginning for developing the organization as well as the system structure. This is because it is far more difficult to change direction later on in the development. A part of the long-term strategy must be to get into control of the cost structure from the very beginning and stay in control as the business evolves. This is necessary in order to be able to automatically calculate profitability per service, customer and region with the BI Solution. Furthermore the Telcos should from the very beginning invest in systems that are compatible with each other. The compatibility is a prerequisite for integrating the different systems. The reason why many Telcos are stuck with isolated systems is that they haven't had a long-term strategy for the systems structure when purchasing the different systems.

The BI Solution has many potential users at different levels within the organizations of the Telcos. It is therefore hard to identify a natural owner of the solution. We believe that a successful implementation of the BI Solution requires an owner of the system that really understands the value of it. To understand how the BI Solution can create added value it takes a good overview of the organization. This is because the main functionality of the BI Solution is that it more or less automatically coordinates different sources of information from different parts of the organization. The owner of the solution has to be a person with great influence on the management of the Telcos. He/she has to be able to persuade the management of the value of the BI Solution. Compared to other systems such as for example billing, it is more difficult to calculate return on investment (ROI) on the BI Solution. A billing system has a very concrete value as it enables the Telcos to get paid for their services. Since the effects of the implementation of the BI Solution are more difficult to foresee it is harder to estimate its added value. It is therefore of vital importance that the owner realizes the value of long-term planning. He/she must finally be a driving-force and maintain his/her support during the process of making use of the BI Solution. Furthermore the different users will have different demands upon the BI Solution. It is impossible to satisfy all these demands through implementing one solution. The Telcos must therefore prioritize between different demands.

Finally it takes intelligent users/individuals to make intelligent decisions based upon the information from the BI Solution. It is therefore important to educate the individuals upon how the Solution should be used in order to create maximum intelligence. It is important that the individuals not to narrowly rely upon the BI Solution. This is because the Solution can never cover all aspects of the environment. Though the BI Solution can help the Telcos to create more intelligent organizations it is not always possible for them to make use of this intelligence. As mentioned before the Telcos can with the solution identify unprofitable services. It is however not always possible or wise to act upon this information. During our interviews we have

seen that it might not for several reasons be so easy for the Telcos to drop a service. First of all the Telcos might have signed contracts with customers about delivering this service. Furthermore this service might be an important part of a bundle of services. Dropping the service might affect the attractiveness of the bundle negatively. Because of this the Telcos might have to find a service that can replace the “old” one, which might however not be so easy. The same reasoning is valid for customers. An “unprofitable” customer might for example be an important reference customer or a valuable partner in developing services through giving the Telcos good feedback.

7.2 Why the Business Intelligence Solution wouldn't create equally intelligent Telcos

All the Telcos can theoretically access approximately the same kind of information about their customers and services. Our interviews indicate that most Telcos will have implemented some kind of BI solution in the future. This is because it will, due to the changing business landscape described in the background, be of vital importance to make use of all the information about customers and services embedded in the network and internal systems. As should be evident from our model in section 5 the Telcos approach in their development the capabilities of the BI Solution. Many persons interviewed have in fact stated that the BI Solution is close to what they believe is an ideal situation. In stating this, these persons reflected only upon the overall concept with its capabilities and not the underlying technology. Implementing a BI solution will be an important prerequisite for long term survival. Assuming that they all implemented exactly the same solution, the BI Solution, we claim that this wouldn't anyhow make them equally intelligent. In this section we discuss this assertion using the theoretical framework of this thesis as a starting point.

The main reason why the BI Solution wouldn't create equally intelligent Telcos is that the Telcos are unique, they differ in other words in the general organizational situation as well as in the individual's work situation. We have in the section 6 given a few examples of factors that contribute to these differences. The Telcos are thereby from the start unequally intelligent and have different prerequisites for creating intelligence. It is important to understand that technology, in this thesis the BI Solution, is just one of many factors that affect the intelligence within the organization. Through implementing the BI Solution it is possible to achieve a more organized scanning. As mentioned before initiating a BI unit is another way to achieve this and the BI Solution could advantageously be implemented in combination with such a unit. Organized scanning affects the prerequisites for the individual's spontaneous environmental scanning. There are however other factors than organized scanning that affect the general organizational situation and the individual's work situation and thereby the individual's spontaneous environmental scanning. As we described in our model of the development of the Telcos they structured during the consolidation phase their organizations in order to increase the transparency, knowledge transfer and the coordinating logic. Structuring the organization might imply to create more clearly defined departments, roles, positions, routines, et cetera. Another example of factors that indirectly affect the individual's spontaneous environmental scanning is that it is possible to increase the individuals' perceived proficiency through educating them.

Another reason why the Telcos wouldn't become equally intelligent through implementing exactly the same BI Solution is that the organized scanning, according to "The Business Intelligence Cycle", can be performed in almost an infinite number of ways. To start with, the Telcos will have different definitions about what information that is business critical. The main reason to this is that the Telcos are unequally intelligent from the start and have different cultures and strategies. The definition decides what information that the Solution will collect. Furthermore the Telcos have system structures of different quality and thereby different prerequisites for what information that can be collected. To what extent the systems are compatible with each other affects the functionality of the BI Solution. We have seen examples of Telcos that have systems that are so isolated that some of them have to be exchanged before they can be integrated. This of course makes up a great obstacle for implementing the BI Solution. Furthermore the quality of the systems also affects the functionality of the BI Solution. There are for example big differences between different billing systems. They differ for example in how detailed information they can collect and also the amount of information that they can process. This of course affects the quality of the output from the BI Solution. To sum up it is a fact that no solution is better than its sources of input.

Furthermore the collected information can be put together/analyzed in an infinite number of ways. Each Telco must decide what level of refinement that is optimal. For example we earlier described the fact that it takes a lot of effort to map out the cost structure of the Telcos. Some Telcos use more stereotyped rules for the cost division than others. The next step for the Telcos is to choose how the information should be disseminated within the organization, for example what individuals should get access to what information. We have seen that some Telcos are very restricted in disseminating information while others assert that all information should be made available to all individuals within the organization. Many Telcos are good at collecting and even structuring the information. They are however in general bad at making the information available to the individuals within the organization.

Furthermore as our theoretical framework points out every organization consists of individuals. The individual's spontaneous environmental scanning, supported by the BI Solution, is done in accordance with "The Learning Cycle". According to the cycle the individual's experience affects what information he/she scans for and thereby appropriates from the BI Solution. This implies that though the individual gets access to the BI Solution his/her decision making process is to a large extent influenced by previous experience. The individuals will thereby analyze the information provided by the BI Solution differently and act differently according to this. The conclusion of the discussion above is that the Telcos will never become equally intelligent through just implementing the same kind of BI solution. Finally many of the persons interviewed believed that the Solution would through increasing the Telcos intelligence improve their ability to identify strengths and opportunities. The BI Solution would thereby lead to divergence in action.

8 Summary

The main purpose of this thesis is to analyze how Telecom operators (Telcos) can make use of the technology of today in order to create more intelligent organizations.

Our first more specific purpose is to analyze the Telcos abilities to make use of the technology, in the different phases of their development, in order to create more intelligent organizations in praxis. Our second more specific purpose is to explain why the Telcos wouldn't become equally intelligent by implementing exactly the same technology. We only consider how an organization can be made more intelligent from a customer and service perspective. This thesis is mainly based on a large number of interviews with Telcos within the Swedish Telecommunications (Telecom) industry. The background to this thesis is that the business landscape of the Telecom industry is changing rapidly in many ways. This has increased the need for the Telcos to create more intelligent organizations and the Telcos face a challenge to adapt their business models according to this.

In this thesis we use a theoretical model for creating intelligence.²⁰ The model builds on the fact that an organization is made out of individuals and that every individual creates his/her own perspectives of the environment. The core of the model is that the perspective making process is affected by both the general organizational situation and the individual's work situation. The result of successfully using the model is an organization where the individual's spontaneous environmental scanning is more directed. This implies that the individual has an increased ability to focus on the tasks that are relevant to him/her and at same time broaden his/her perspectives in order to catch the unexpected. A more directed scanning creates a more intelligent organization with an improved capability to foresee the future, to change its behavior according to the changing conditions in the environment and to act proactively.

In our thesis we use a specific business intelligence solution, developed by EHPT, as an example of the technology of today. The technology of today can help the Telcos to achieve more organized environmental scanning and through this approach a more directed environmental scanning. We have primarily focused on the concept/benefits of the BI Solution rather than the technical aspects. The conclusions of this thesis are therefore theoretically solution independent. The main functionality of the BI Solution is that it coordinates several sources of information. Through this it is for example possible for the Telcos to, more or less automatically, calculate profitability per service/customer/region. Furthermore it is possible to analyze the behavior of the existing customer base. This information can with the help from the BI Solution be made instantly available to decision-makers at all levels within the organization.

To be able to analyze how the BI Solution can create intelligence in praxis we have created a model of how the Telcos have developed over time. In this model we divide the development of the Telcos into four phases with different characteristics. We have chosen to call these phases; "startup", "expansion", "consolidation" and finally "controlled growth". We also identify a number of factors that can affect how fast the Telcos develop over time towards more intelligent organizations. The factors can help explain why some Telcos are more intelligent than others are though they have been on the Telecom market for the same number of years.

Through putting all previous parts of this thesis together we conclude that it would be a great advantage for the Telcos to implement and make use of the BI Solution at an early stage of their development. This is because the amount of business critical

²⁰ Hamrefors, Sven, "Spontaneous environmental scanning- Putting "putting into perspective" into perspective", Dissertation, Stockholm School of Economics, 1999.

information literally explodes as the customer base grows in the expansion phase. Our model of the development of the Telcos however indicate that it is probably difficult for the Telcos to early implement and make use of the BI Solution. This is because there are scarce resources and certain basic abilities that the Telcos have to develop before they can start to think about creating more intelligent organizations.

We recommend the Telcos to, as far as it is possible, to have a long-term strategy set from the very beginning for developing the organization as well as the system structure. This is because it is far more difficult to change direction later on. Furthermore it is important to understand that creating an intelligent organization is a process that must be carried out step by step and that requires a lot of time and other resources. We believe that successful implementation and usage of the BI Solution requires an “owner” of the solution that really understands the value of it. This “owner” has to have a good overview of the organization and great influence on the management of the Telco. He/she must be a driving force and maintain his/her support during the process of making use of the BI Solution. Furthermore the Telcos have to prioritize between the many demands of the users as it is nearly impossible to implement one solution that satisfies all the needs of the individuals within the entire organization. Finally it takes intelligent users to make intelligent decisions based on information from the BI Solution.

Most probably the Telcos will in the future have implemented some kind of BI solution. This is because it will, due to the changing business landscape described in the background, be of vital importance to make use of all the information about customers and services embedded in the network and internal systems. All Telcos develop in the direction towards becoming knowledge enterprises. They approach in their development the capabilities of the BI Solution described in this thesis. We finally end this thesis with the conclusion that though the Telcos implemented exactly the same BI Solution this would not make them equally intelligent.

9 References

9.1 Books

Hamrefors, Sven, “Spontaneous environmental scanning- Putting “putting into perspective” into perspective”, Dissertation, Stockholm School of Economics, 1999.

9.2 Articles and other written sources

Biddlecombe, Elizabeth and **Shetty, Vineeta**, “Taken out of storage”, CI, 01/08/98.

Faltys, John, “Rules-Based Software for Telecommunications Targeted Marketing”, DM Direct, March 2000.

Goldman, Lawrence, “Customer Relationship Management: The Future of CRM Toys”, DM Review, January 2000.

Grandy, Cheryl, “Power + Performance for Marketing Databases”, Dynamic Information System Corporation.

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McClain, Duncan, “Customer Data Integration: The Essential Component of Effective CRM”, DM Review, June 2000.

Molony, David, “The Business: Operators learn true value of customer care”, CWI, 29/11/99.

Osterfelt, Susan, “Business Intelligence: The Whole Customer”, DM Review, June 2000.

Schroeck, Michael, “Insights from the Front Line: Understanding the Telecom Customer”, DM Review, July 1999.

9.3 Interviews

Company	Interviewed	Position within the company	Date
Cap Gemini	Berg, Susanna	Consultant	26/09/00
	Stephansson, Karin	Consultant	09/10/00
EHPT	Aasa, Magnus	Sales Account Manager	02/10/00
	Ashton, Todd	Product Manager	14/09/00
	Bokinge, Ingrid	Project Office Manager	12/09/00
	Carlsson, Christina	Portfolio Manager	22/09/00
	Carlson, Martin	Sales Account Manager	02/10/00

	Carriazo, Javier	Sales Account Manager	27/09/00
	Dessonet, Charles	Product Manager	14/09/00
	Grote, Anna	Business Support Manager	08/09/00
	Hamrå, Lars	Product Portfolio Manager	02/10/00
	Landersten, Lennart	Product Marketing	20/09/00
	Lillo Rivera, Lisette	Product Marketing	08/09/00
	Lindström, Tommy	Business Manager	01/09/00
	Olsson, Jonas	Consultant	12/09/00
	Palmquist, Ulf	Regional Manager	02/10/00
	Peränen, Katrin	Sales Account Manager	14/09/00
	Pettersson, Hans	Business Development Manager	13/09/00
	Ribbing, Seved	Regional Sales Manager	19/09/00
	Sundberg, Joakim	Leader Hit Team US	21/09/00
	Wesshagen, Bosse	Project Leader	27/09/00
	Westerlund, Claes	Sales Account Manager	26/09/00
	Åhlander, Mats	Senior Business Consultant	21/09/00
	Österbrand, Karin	Sales Account Manager	02/10/00
Global One	Ljunggren, Madeleine	Billing Manager	23/10/00
	Melin, Owe	Sales Manager	24/10/00
GTS	Malm, Diana	Marketing Manager	10/11/00
	Nylander, Hans	Director Sales	06/11/00
	Ålander, Helene	Product Manager	24/10/00
KPN Qwest	Kestad, Susanne	Sales Manager	14/11/00
	Öhnfeldt, Anders	Country Manager	09/11/00
Worldcom	Ericsson, Stefan	Product Manager	01/11/00
NetNet	Salwén, Henrik	Chief of Product Management	06/10/00
RSL COM	Eriksson, Mats	Product Manager	08/11/00
	Harging, Niklas	Direct Sales Manager	09/11/00
	Wickholm, Bo	Billing Manager	10/11/00
	Wisinfeldt, Fredrik	Marketing Assistant	08/11/00
Sonera	Ekström, Birgitta	Sales Manager	15/11/00
	Idesjö, Marie	Contact Center Manager	23/10/00
	Honkonen, Jaana	Marketing Manager	16/11/00
	Petäjajarvi, Anita	Product Manager	02/11/00
Tele2	Bond, Maria	Manager Sales Controlling	05/10/00
	Pettersson, Jens	Chief of Product Management	13/10/00
	Johansson, Rolf	Data Warehouse Manager	16/10/00

	Selinder, Per-Ivan	Director Program Management	27/10/00
Telenordia	Astner, Pär	Product Manager	23/11/00
	Bonnier, Claës	Chief of Product Management	01/12/00
	Westkämper, Anders	Sales Director	23/11/00
	Wetterstrand, Eva	Director Marketing	06/12/00
Telia Validation	Beiming, Peter	Senior Account Manager	19/10/00
	Olovsson, Steve	Senior Manager	19/10/00
Telia Företag	Johansson, Magnus	Consultant, CRM-project	03/11/00
Telia Megacom	Jacobsson, Susanne	Marketing Manager	28/11/00
	Lönn, Berit	Director CRM	21/11/00
Telia Mobile	Lewén, Christer	Product Manager	17/11/00
	Pierre, Lena	CRM Manager	20/11/00
Telia Nära	Åkerström, Bernt	BI Manager	28/11/00
Telia Telecom	Adolfsson, Bo	Responsible for Internal Relations	03/10/00
	Moo, Kristina	Business Manager	17/10/00
	Weidenhajn, Fleming	Product Manager	10/10/00
Telitel	Brännström, Elena	Marketing Assistant	27/10/00
	Engevik, Torsten	IT Manager	27/10/00
	Follinger, Magnus	Product & Business Development Manager	31/10/00
	Olsson, Anders	Marketing and Sales Director	09/11/00
Utfors	Antonsen, Fredrik	Chief of Product Management	17/10/00
	Bergman, Julia	Marketing Manager	06/11/00
	Savelius, Charles	Network Planning Manager	04/10/00
	Sundberg, Jan	Sales Manager	13/11/00
UUNet	Berg, Sven	Product Manager	25/10/00
	Tjernström, Hans	Country Director, Sweden	31/10/00

9.4 Homepages

Telcos/Firm of consultants

www.se.cgey.com/

www.ehpt.se

www.globalone.se

www.gts.se

www.kpnqwest.se

www.worldcom.se

www.netnet.se
www.rslcom.se
www.sonera.se
www.tele2.se
www.telenordia.se
www.telia.se
www.telitel.se
www.utfors.se
www.uunet.se

Others

www.dmreview.com
www.informix.com
www.totaltele.com

9.5 Lectures

Garberg, Göran, Stockholm School of Economics, 001207.

Hamrefors, Sven, “Cognitive Prerequisites for Environmental Scanning”, Stockholm School of Entrepreneurship, 001106.

Hamrefors, Sven, “Contextual Influence on Environmental Scanning”, Stockholm School of Entrepreneurship, 001108.

Hamrefors, Sven, “Organized Scanning for Entrepreneurial Action”, Stockholm School of Entrepreneurship, 001109.

Hamrefors, Sven, “Theoretical Framework Recap”, Stockholm School of Entrepreneurship, 001211.

10 Appendix

10.1 EHPT

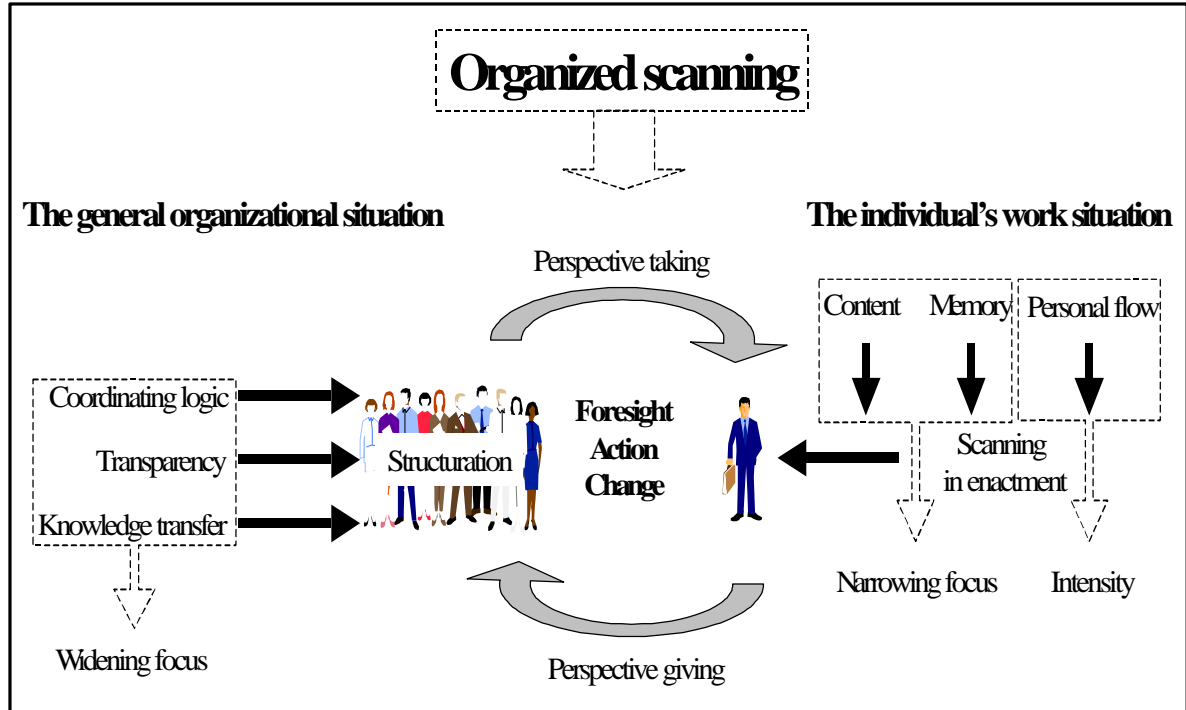
EHPT is an independent convergent communications software vendor owned jointly by Ericsson and Hewlett Packard. The customers are Telcos with both fixed, mobile and IP networks, and Internet service and content providers throughout the world. EHPT was founded in 1993 to converge the two companies' know-how in Telecom and datacom management. In 1999 the company had 1400 employees located in 17 offices worldwide in Sweden (headquarters in Stockholm), France, Spain, Italy, Germany, England, India; Malaysia, USA, Mexico and Australia. Net sales were 1701 M SEK in 1999. The vision of the company is stated "to enable Telcos and service providers to introduce innovative services and solutions as well as to effectively and efficiently manage their operation".

For further information about the company please visit www.ehpt.com.

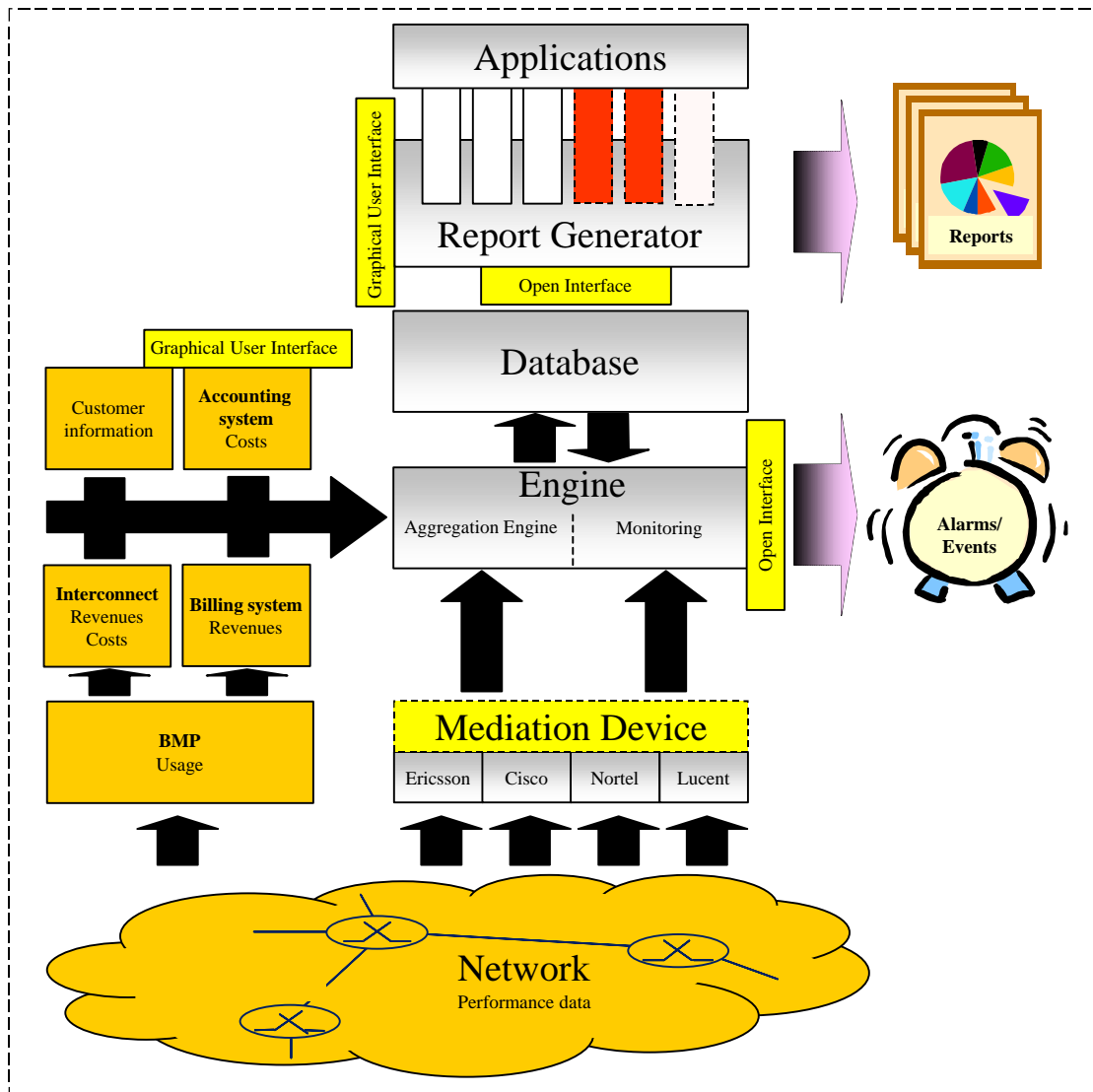


Picture: Main office of EHPT in Stockholm.

10.2 The model for creating intelligence



10.3 A schematic overview of the Business Intelligence Solution



10.4 Questionnaire



- A. Inform about our thesis**
- B. Questions about the company**
- C. How the Telco handles business critical information today**
- D. Examine what information the Telco would like to have in an ideal situation**
- E. Present the BI Solution concept briefly (show our overview)**
- F. Present the functions/benefits of the BI Solution and examine if the Telco has the same capabilities today**
- G. Examine what the interviewed thinks about the Solution**
- H. Provoke- examine whether the Telco would use the BI Solution in praxis**
- I. Future**

A. Inform about our thesis

B. Questions about the company

1. What is your position within the company?
2. How does a Telco generally develop over time?
3. In what phase of development is your company right now? How would you describe the situation of your company today?
4. Can you describe how you, as a Telecom operator, have developed over time!
5. Can you give examples of factors that have had a great impact on this development?
6. What are/have been the general trends within the industry affecting your company?
7. Competitors:
 - Which are your main competitors?
 - In which phases are these competitors?
 - How do you segment your competitors?
8. How does your company relate to your competitors, that is to what degree is your corporate strategy proactive?

C. How the Telco handles business critical information today

9. What information do you have about your **customers** and **services** when making business decisions today?
 - (What does the process of launching a new service look like?)
 - (Why do you launch a certain service (selection criterias)?)
 - (How do you segment your customers?)
10. How do you get the information? (People, routines, systems et cetera)
 - What systems are essential for you in your daily work?
 - What systems give you a good possibility to act proactively?
 - What other systems do you get important information from?
 - When were the systems implemented and why?
11. How do you use and act upon the information?
 - What kind of reports have you personally used during the last week?
 - What other kind of interaction do you have with this system (alarms et cetera)?
 - How come you use this system, what benefits does it give you?
 - What alternatives do you see to the system that you have today?
12. In what way are you not satisfied with your systems?

- What benefits don't the systems provide?
 - Not enough user-friendly et cetera?
13. Why do you think some Telcos are better than others at making use of the information that is available about the customers and services in the internal systems and networks?

D. Examine what information the Telco would like to have in an ideal situation

14. What would an ideal work situation for you look like?
15. What information about customers and/or services would you have in an ideal situation?
- What level of information do you want?
 - In what format do you want the information?
16. Why would that information be ideal?
17. How does this ideal situation differ from your situation today?
18. What customers would you ideally like to have?
19. Define what you mean by a profitable customer/service! Which customers/services are the profitable ones? Are there unprofitable customers/services?

E. Present the BI Solution concept briefly (show our overview)

20. Spontaneously, what do you think about this system?

F. Present the functions/benefits of the BI Solution and examine if the Telco has the same capabilities today

(Remember to relate back to section C. and D.)

- 21.
- Profitability per customer/service/region
 - Ability to analyze the behavior of existing customers
 - Alarms/events
22. Do you miss any functions/benefits that you need in your decision situation today?

G. Examine what the interviewed thinks about the Solution

23. Do you see the value of the BI solution?

24. How important/essential is a solution like this for your business?

25. How does the system fit in with the existing organization structure?

I. Provoke- examine whether the Telco would use the BI Solution in praxis

26. How do you define a customer?

27. How do you segment customers?

28. Can you explain what your company's cost structure looks like?

- What costs can you measure today?
- Which costs are relevant when calculating margins?
- How do you divide costs upon services and customers?

29. Do you have the resources (tools, time, personnel, motivation, et cetera) to make use of the information provided by the BI solution?

30. Would you be prepared to take the consequences of the analysis for example terminating an unprofitable service?

31. Would the use of the BI solution affect your business strategy?

J. Future

32. Will this kind of solutions become standard in the near future?

33. Would this kind of solutions lead to convergent behavior among the Telcos?

10.5 About the authors

We, Mårten Jegenstam and Tor Kihlberg, are two students at the Stockholm School of Economics. We have both completed our major in marketing and are now during our last term attending the Information Management Program. During our studies we have gained a deep understanding for the Telecom industry. We have especially focused on CRM and business intelligence matters within this industry. This is something that we find extremely interesting and would like to work with in the future.



Picture: Tor (to the left) and Mårten (to the right)

If you have any questions, don't hesitate to contact us:

Mårten Jegenstam
17625@student.hhs.se
070-482 79 20

Tor Kihlberg
17863@student.hhs.se
070-400 30 23