
EXECUTIVE SUMMARY

- Title:** XML Web Services and the paradigm shift in the Telecom Industry
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- Department:** Department of Business Administration and Management
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- Problem:** There are a lot of changes happening in the telecom industry now since the Telecom and Internet is converging. Another thing playing a big role is that the new technology, Web Services, is emerging. Since new technology and changes in businesses goes hand in hand, there is a need to map these changes and see how to make money of the new technology in the telecom industry.
- Purpose:** By investigating Web services and the convergence of the telecom industry and Internet, we want to see what Web Services can do for the Mobile Internet.
- Method:** The empirical material has been collected from two places; Ericsson and interviews. The interviews have been done via e-mail. The companies have roughly been divided into these groups:
- Operators
 - Application and service providers, content providers and portals
 - Companies that are using Web Services in their business
- Conclusion:**
- Web Services are in its early stage but is thought to have (or can have) the possibility to spur the mobile industry.
 - New markets (for instance Web Services) and new entrants (because of Web Services) in the mobile Internet are forcing the actors to decide how to position themselves.
 - Collaboration and niche markets is important in order to succeed
 - Services need to be customer driven and packaged
 - It is hard to distinguish specific business models since there are potentially infinite varieties, but they can be categorized on logical basis.

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1. READING INSTRUCTIONS

The thesis is divided into four main parts. First, we have a section called 2. *When Technology enables, Business changes*. Here we give the reader the background to our problem concerning new technology and the changes that occur in the telecom industry. We will also state our purpose and describe our method, definitions, and delimitations.

The second part of the thesis is our theoretical discussion. We have divided it into two parts. The first, 3. *The Different Actors*, deals with technological issues and in the other, 4. *The Rise of B-webs*, we describe the changes that new technology can do for a company's business model and value chain.

The third main part is the analysis section. Here we discuss the answers we have received from the companies and we also talk about different articles that we have read and that we think are appropriate to discuss. The section has been divided into three parts. The first one, 5. *Analysis – Web Services*, deals with the new technology, in the second 6. *Analysis - Business models* we talk about appropriate business models for Web Services. The last part in the analysis section is 7. *Analysis - The Telecom Industry*. In this one, we will discuss the changes happening in the telecom industry, what affect Web Services has on it, and what affects it has on business models.

The last main part of our thesis is 8. *Conclusion*. We summarise the keypoints of our thesis and suggest useful awareness for other studies.

Above from these four main parts we also have section called 9. *Self-criticism*, where we take a critical and introspective look at our work.

2. WHEN TECHNOLOGY ENABLES, BUSINESS CHANGES

In this chapter we describe the background to our problem, which will lead us to our problem. We are interested in to see how Mobile Internet and Web services will affect the telecom industry. We will start by discussing Mobile Internet and the different roles in the industry. Next we will describe the Web Services and after that we will reach our problem.

2.1. Mobile Internet

The Internet has gone through several steps in its life cycle. It has been a way for companies to provide the world with information about their businesses and products. E-commerce has also played an important part in the development of Internet. Companies have used it as channel to sell products and services via the Internet.

Now Internet is converging with the mobile industry into a mobile Internet where wireless access is used. So, two types of Internet can be distinguished, the fixed and the mobile. The fixed Internet can be described as Internet that uses fixed access, when Mobile Internet uses wireless access.¹ Mobile Internet is the convergence between two industries, Mobile telephony and Internet, which means that it is possible to access the Internet through mobile terminals. This result in new opportunities, and new products and services are made available.²

With the emergence of wireless networking, physical assets³ are not as valuable anymore. A wireless network can be cheaper to set up and run, and more flexible, than a wire-based one. Such networks will empower both customers and content providers with new kinds of flexibility and choice. Customers will be able to choose among a variety of competing service providers and also new services, comparable to those on Internet itself, will emerge for the new wireless communications infrastructure. A competitive market will arise as a result. In this market network assets will be less relevant, and it will be more focus on customer choice and value-added services.⁴

The wireless and mobile world is different from the wired world, particular concerning content, commerce and community. The most important dissimilarity is that in the wireless and mobile world a large number of supply chain partners have to work together to offer the most suitable combination of information and services to the customers. This will occur even as they compete for the customer revenue. This way of working, where they both compete and collaborate is called co-opetition. In order to be successful the

¹ Christoffer Andersson, *Internet + Mobile Internet = Love*, 2000

² Jenny Fürstenbach et al, *Mobile gaming - business models for games on mobile internet*, 2000

³ With physical assets we mean the stockpiling, inventory, shipping products, buying equipment, installing machinery and building factories

⁴ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

businesses need to quickly and cost effective form, modify, and manage new supply chain partnerships.⁵

2.1.1. Actors in the Mobile Internet

In this industry more actors are involved in delivering mobile applications and competing for a place in the value chain, and their relationships are more complex than in traditional corporate or Internet environments.⁶ We see a lot of different roles where one company, e.g. an operator, can have one or several roles. The actors can at the same time be both competitors and partners with each other. The industry is also changing fast and new roles are constant emerging.⁷ Success will depend on the right mix of partners and a viable business model.

Before the convergence, the actors in the telecom industry had distinct roles and where doing the things they knew the best. The value chain looked as the figure below shows. The vertical row shows the players and the horizontal row demonstrates the position of the players in the value chain. As seen by the grey squares the players were doing the things they were assign to do.

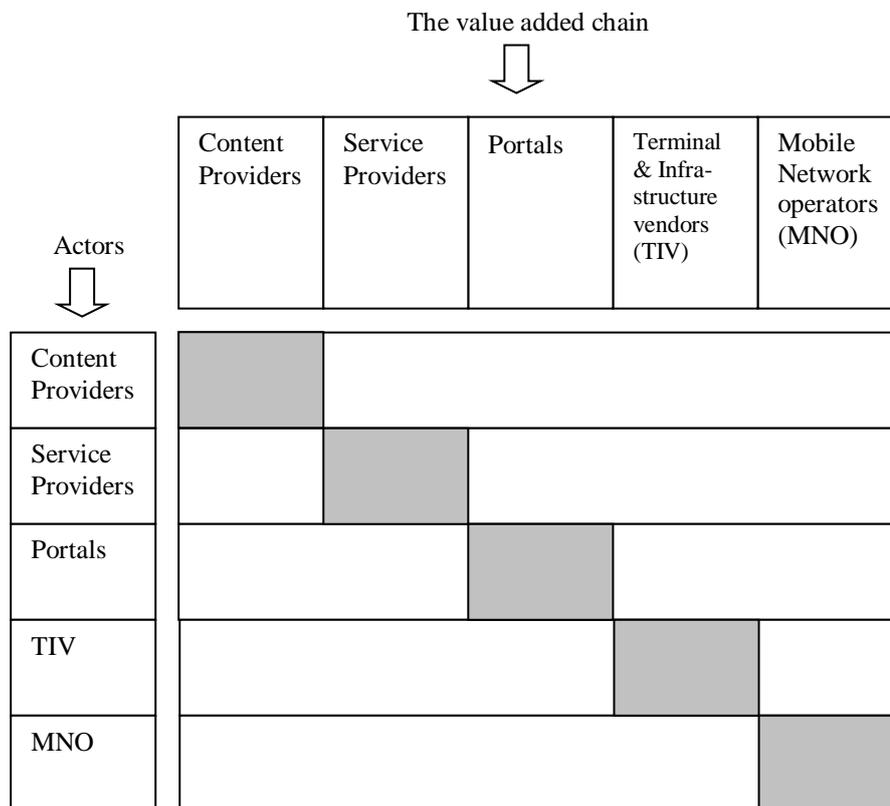


Figure 2-1 *The roles of players in the telecom industry before the convergence*⁸

⁵ Vitria, *Succeeding in the mobile space*, 2001

⁶ Computer Science Corporation (CSC), *The 2000 3G mobile phone study tour*, 2001

⁷ Ericsson Internal

⁸ Jeremy Matthews et.al, *Wireless internet business models: global perspective, regional focus*, 2001-08

2.1.1.1. New Roles for Existing Actors

As shown in the figure below the actors in the telecom industry are after the convergence extending their positions in the value chain. The black spots and the arrows show their new roles and where they are moving. We will later in the thesis discuss this evolution and show evidence from the real world.

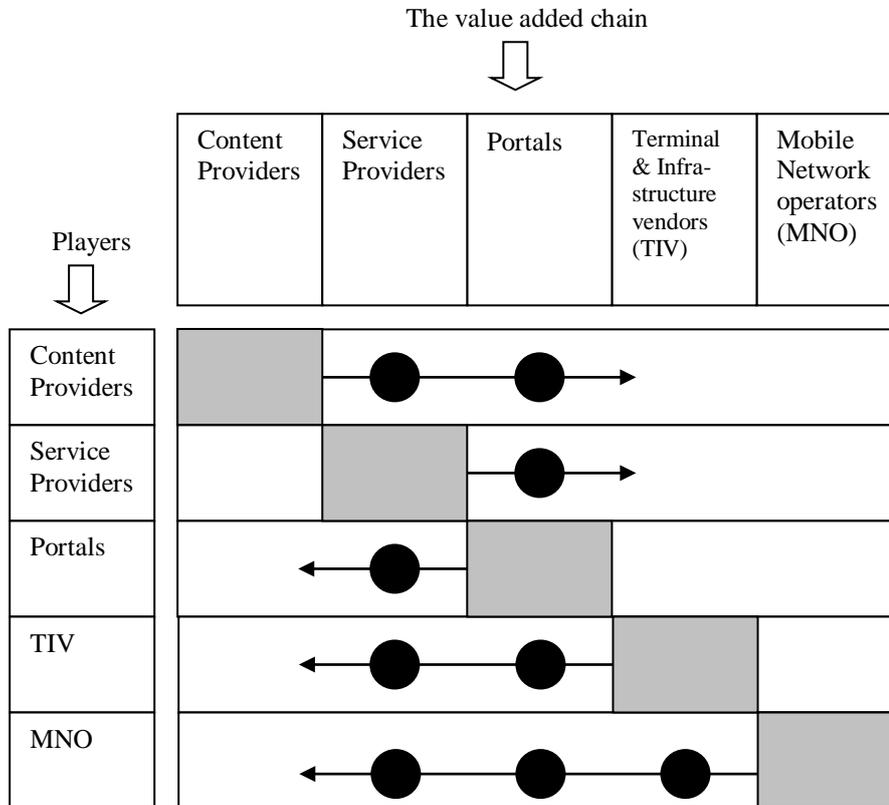


Figure 2-2 The changes of the players in the telecom industry after the convergence⁹

2.2. The Emergence of Web Services

The boundaries to the actors' roles in the value chain are becoming blurry and their business processes will change. They will compete at the same time as they collaborate with each other. These new changes in their business will probably also be affected by new technology. We draw this conclusion by the changes that have occurred in past concerning new technologies and new ways of doing businesses.

Aronica and Fingar¹⁰ mean that when new technologies emerge the companies start to redesign their business processes. They do this because they are either able to or being forced to change when new technologies are introduced. When client-server technologies were introduced the companies could improve the processes by tying together information across business units and individual departments. This method is called Business Process Reengineering (BPR) and is shown in the figure below.

⁹ Jeremy Matthews et.al, *Wireless internet business models: global perspective, regional focus*, 2001

¹⁰ Ronald Aronica et.al, *The death of E and the birth of the real new economy*, 2001

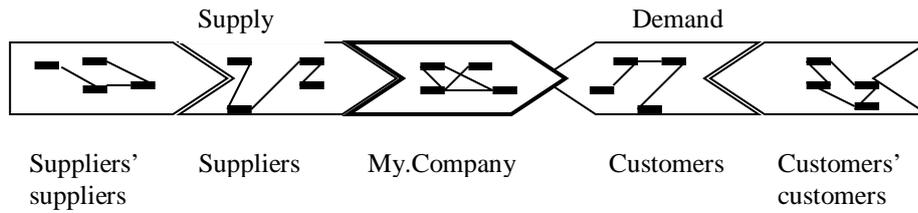


Figure 2-3 Business Process Reengineering (BPR): Reengineering and innovation inside the company using client-server technologies¹¹

As companies embrace the Internet to redesign business processes that cross company boundaries, they enter the Industry Process Reengineering (IPR). These companies have the opportunity to reach out electronically to their trading partners. It makes it possible for the companies to eliminate duplicate processes and to improve the connections between and among companies in real-time.

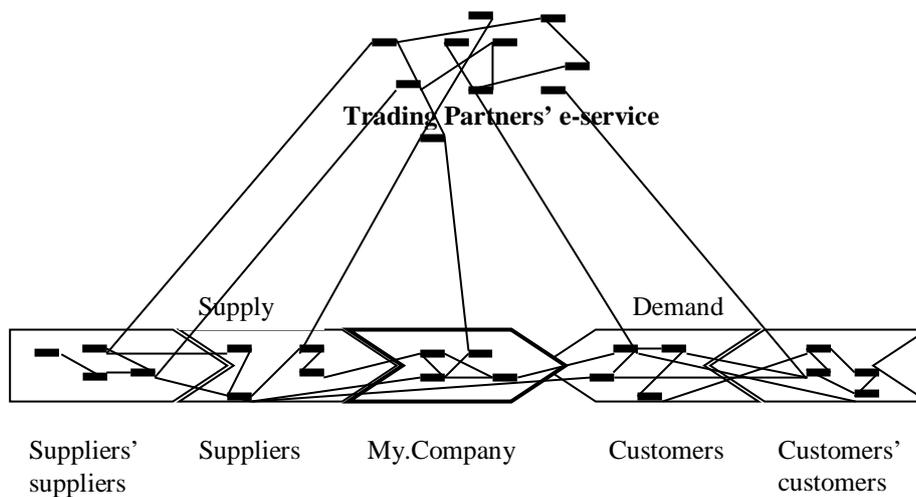


Figure 2-4 Industry Process Reengineering (IPR) Phase1: Reengineering and innovation across industries using Internet technology¹²

The development of the use of Internet leads to companies creating b-webs.¹³ These b-webs are a web of any-to-any connections, which means that the companies can reach out to their different partners in the value chain instead of just having connection to the ones in front or behind them in the value chain. As shown in the figure below there is a need for Web Services in order to connect companies' different web systems more effectively.¹⁴ More about value chains and how they change will come later in the thesis.

¹¹ Ronald Aronica et.al, *The death of E and the birth of the real new economy*, 2001

¹² Ibid.

¹³ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

¹⁴ Ronald Aronica et.al, *The death of E and the birth of the real new economy*, 2001

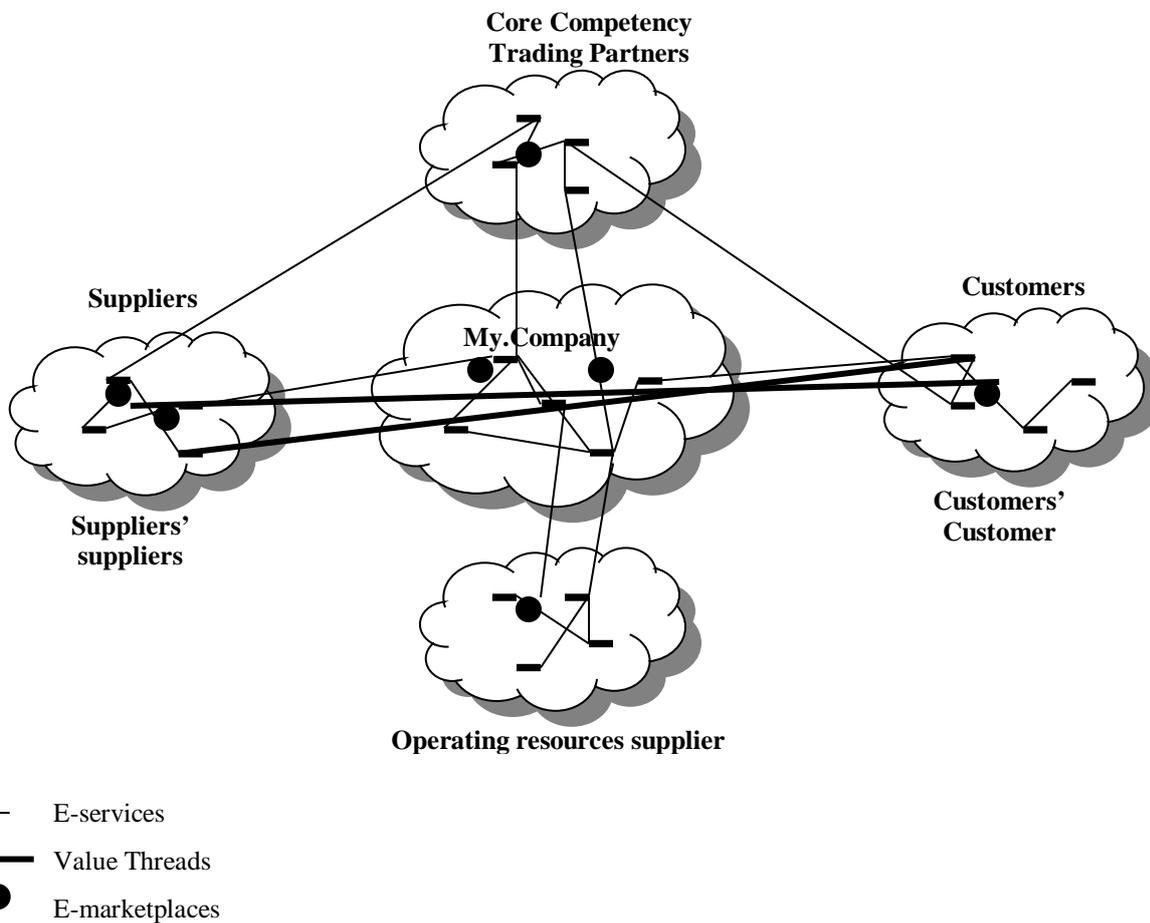


Figure 2-5 Structure of the business web and the need for Web Services¹⁵

2.2.1.1. Web Services – a Cheaper Alternative

In order to integrate the information within the companies, the companies have for a long time used Enterprise Resource Planning (ERP) systems.¹⁶ These systems typically cover all major areas of a business, including manufacturing and production, stock control, finance and accounting, payroll, and human-resources. Electronic Data Interchange (EDI) and electronic commerce are often a part of an ERP system with the purpose of allowing the system to communicate with trading partners.¹⁷

The disadvantages with these systems are the high costs, inflexibility and that they can be time-consuming to implement in that sense that they do not support the inter-company approach of doing business.¹⁸ Therefore there is a need for a Commerce Resource Platform (CRP) that integrate all businesses with each other, and that easy creates new digital marketplaces and relationships.¹⁹ Web Services is a new hype technology that enables these solutions interoperable and can reduce the costs of doing businesses significantly.²⁰

Web Services is about B2B, business-to-business, which is the connection of the companies different web systems. Suppliers are struggling to develop consequent, simple ways to exchange information between companies, and to find new ways of doing

¹⁵ Ronald Aronica et.al, *The death of E and the birth of the real new economy*, 2001

¹⁶ Ibid.

¹⁷ http://www.orionltd.co.uk/glossary/gloss_e.htm

¹⁸ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

¹⁹ Ronald Aronica et.al, *The death of E and the birth of the real new economy*, 2001

²⁰ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

businesses.²¹ While EDI only gave the opportunity to exchange data, Web Services let the company open up their systems and share different kinds of information.²² There are a large amount of suppliers investing in it, like IBM, Oracle, Microsoft, Sun and Bea. They all support the standards, which define how different computer systems will communicate with each other.²³

2.2.1.2. What is a Web Service?

Web Services are based on four different software standards. *Extensible Markup Language (XML)* is one of them and is developed by the World Wide Web Consortium (W3C).²⁴ XML is a meta-language that lets programmers write their own tags to identify information on a webpage and put it into context.²⁵ It can be defined as the digital representation of documents, which means that XML represents the documents in a way that the computer can “understand”.²⁶ The second standard is *Simple Object Access Protocol (SOAP)*, which describes how one application dials up a Web Service and asks it to perform a task and return an answer. SOAP makes it possible to use Web Services for transactions, for example checking inventory in real-time and placing an order. *Universal Description, Discovery and Integration (UDDI)* is the third standard. It can be seen as the virtual yellow pages for Web Services and it lets software discover what kinds of Web Services are available and how to connect to them.²⁷ The last standard is Web Services Description Language (WSDL), which is a file that contains all the information you need to know on how to run a Web Service.²⁸

A Web Service communicates directly with other Web Services via the standard-based technologies described above. These standard-based communications allows Web Services to be accessed by customers, suppliers and trading partners. It does not matter what kind of hardware, operating systems or even programming environment they have. This means that every business can expose their current and future business applications as Web Services, which can be easily discovered and consumed by external partners.²⁹

In short, Web Services can be described as a standard for transferring data on the Internet. Compare to a web page, a Web Service is created in order to let a program or business system perform the same thing as people normally do.³⁰ An example can be seen in the travel industry where following scenario can take place. If a person’s flight were unexpectedly cancelled a Web Service would do the following without any human interaction.³¹

- The airline Web Service automatically finds another flight and notifies the car rental service.
- The rental car service changes the car rental schedule

²¹ Computer Sweden, *Web Services lyckat när man börjar smått*, 2002-04-17

²² Computer Sweden, *Web Services bygger broar mellan systemen*, 2002-04-22

²³ Computer Sweden, *Enklare kommunikation över Internet*, (2002-04-22)

²⁴ Berthold Daum et.al, *The XML Shockwave*, 2001

²⁵ Patton Susannah, *The basics – Web Services terms you need to know*, 2002

²⁶ The XML handbook, *Just enough XML*, 2002

²⁷ Patton Susannah, *The basics – Web Services terms you need to know*, 2002

²⁸ SOAP Web Services, *All you need to know*, 2002

²⁹ Hewlett-Packard (hp) White paper, *hp Web Services platform (business level)*, 2001

³⁰ Dagens Handel, *Effektiva Internet när maskinerna pratar med varandra*, 2002

³¹ Hewlett-Packard (hp) White paper, *hp Web Services platform (business level)*, 2001

- The hotel reservation Web Service is notified of a later arrival time
- When all these Web Service interactions have been completed and the new schedule is available, the airline Web Service notifies the traveller via a message on their mobile phone.

2.3. Problem Formulation

Whenever a new technology has been developed it does not take long before companies try to figure out how to make money from it.³² The same goes with Web Services; the companies may have to develop new business models in order to make money from the new technology. Another reason for the need of developing new business models is the changes that occur in the telecom industry's value chain, where new actors are emerging. This is evident since the telecom industry is converging with the Internet and opens up new markets where more competition and collaboration will occur. The companies have to make sure that they are not being left out and they need to try to find how to satisfy the customers.

Our problem is the relationship between the content and service providers, operator and the end-user. As stated before Web Services and the Mobile Internet may change the traditional business relationships in the telecom industry. The content and service providers see the Mobile Internet as a new channel through which they can offer content and services. The operator benefits from the new content and services being offered, since it will increase traffic in their network, which leads to increased revenue. However, if the operator will continue to have a central and dominant role it will probably stop the development of new content and services since the service and content providers think they will not benefit from it.

Therefore there must be good reasons for the content and service providers to develop new services and contribute with content to the mobile devices. It is like an eco-system between the players and all parts are dependent of each other. The companies do not just do their own thing and deliver it to the next one in the value chain; they are extending their businesses and in that meaning create new business relationships. Here the Web Services plays an important role. It can:

- Impact the way the services and content are offered in an easier and cheaper way
- Improve the relationships between the players
- Fuel service development creating developers environment
- Stimulate the mobile Internet service industry

However, the problem is how to share the revenues and how to best benefit from the new technology. The companies need good arguments about the benefits of the technology in order to move towards a Web Services-based strategy. They may also be forced to change since the technology may be the thing that pushes the development. We want to explore further what is happening in the telecom industry, what Web Services could do for the declining telecom industry, and what benefits it can give and how to make money off it.

³² Adrian Mello, *Getting down to business with Web Services*, 2002

2.4. Purpose

By investigating Web services and the convergence of the telecom industry and Internet, we want to see what Web Services can do for the Mobile Internet.

2.5. Method

We are now going to describe what methods we have used and why we used them.

2.5.1. Three kinds of investigation

There are different kinds of investigations.³³ They can be divided into three groups after how much knowledge there is about a certain area of problem. When the knowledge is not complete the investigation will be *Explorative*. *Descriptive* is when there is a lot of knowledge about the problem area. The last type of investigation is *causal*. It is used when the knowledge about the area is extensive and when theories have been developed. In bigger project two or all three types can be used.

Our investigation can mostly be seen as explorative. The new technology, Web Services, has not yet been fully developed, which means that the knowledge in the area is not complete. We needed to collect as much information about it as possible in order to delimit us to our problem and to continue our work. We also had a descriptive approach, since there are a lot of models and theories about business models and value chains that we have used in order to describe the situation. There are also a lot of theories about how new technologies establish on the market and how businesses change as a result of advances in technologies.

2.5.2. Theories

There are two different ways to work with theories; deductive and inductive.³⁴

In the *deductive* way of working the work is done from existing theories and conclusion is drawn from a certain phenomena. The existing theory decides what kind of information is needed and how to analyse this information and at last how to relate the result to the existing theory.

Inductive is the opposite of deductive. The research object is studied without taking much notice of existing theories. The collected information, empiric, is then formulated into a theory.

Our way of working has been a mixture of deductive and inductive. We have tried to first look at existing theories such as theories about business models, value chain and the situation in the Telecom industry. After that we looked at what kind of information we needed and from interviews we have gather information that has been analysed into our result. However it can also be seen as inductive since there are not a lot of theories about business models in Mobile Internet. We have collected information and empiric about that and from that tried to established theories.

³³ Holme, *Forskningsmetodik*, 1997

³⁴ Ibid.

2.5.3. Empirical study

Our empirical object is business models in the Mobile Internet. The empirical material has been collected from two places; Ericsson and interviews. The interviews have been done via e-mail. We have chosen to send e-mail since most of the companies we are interested in are located abroad and it would have been too expensive to interview them

We started by sending test e-mail to a company in order to see how likely it was to receive an answer. We got a quick reply. After that we have sent e-mail to around 100 companies. Since our questions have been about business models and strategies, many companies have not been able to answer our questions. Some companies have answered that the only information that we can get is the one available on their homepage.

We used a standard e-mail to all companies but we also added different questions depending on what kind of company it was sent to. It was necessary to do it like this since the companies have had different connections to Web Services. The companies have roughly been divided into these groups:

- Operators
- Application and service providers, content providers and portals
- Companies that are using Web Services in their business

One question to the companies was if they knew about any companies using web services or that could be in interest for us. We received many useful answers that lead us to several interesting companies. To some companies we have sent additional e-mails in order to receive a better explanation and further information. Since the technology is rather new, many companies have had a hard time answering our questions.

The companies that did not answer us after a week or two have been reminded via e-mail from us. The main problem with interviewing via e-mails is the fact that a lot of companies do not answer at all and it is hard to reach the most appropriate persons. We sent e-mail to around 100 companies but only received 15 useful answers.

So it might have been better to use another way of interviewing companies. A good idea would have been to find companies in Blekinge that have good knowledge concerning Web services and the telecom industry and interview them face-to-face. However we did try to reach some companies via phone but it turned out that a lot of people did not know what Web Services is. It is always hard to find the right people when you do not know the companies.

When interviewing companies via e-mail the only way to entice them to answer is to write something motivating in the enclosed e-mail. This e-mail is called the *massive*. We tried to motivate them by telling them that they could get a copy of our thesis if they answered the questions. We think this was a successful approach since many of them have responded to this.

Further we have also used the forum at webservices.com, which is a web page for people with interest in Web Services. There we posted a message with our questions. As a result of that we got in contact with interesting companies and received further information from them.

Our questions could perhaps have been written in another way. They may have been hard to answer if the person does not have complete knowledge in the area. We did rewrite them during the time we worked since we realized that they could be misinterpreted.

Our main questions have been:

- What business opportunities do you see with Web services?
- How may companies' business models change as a result of Web Services?
- How do you think Web Services will affect the telecom industry?

We wanted with these questions see what thoughts the companies had concerning Web Services and business models. The answers have given us better knowledge in the area and have been useful in our continuous work. However, during our work we have changed our purpose so if we were to ask the questions again we would have asked some additional questions to get more feedback.

The other part of our empirical study we have got from Ericsson. We have written the thesis in cooperation with Ericsson, which means that we have been able to use their internal material and discuss things with the employees at Ericsson. This has given us an opportunity to gain insider information. We have during our time at Ericsson witnessed how the telecom industry has changed and we have been able to hear their thoughts and strategy in this new fast growing world.

2.5.4. The work

The information we have gathered is based on a *qualitative* study. This kind of research use verbal analysis methods. The purpose with qualitative studies is to get deeper knowledge compared to using quantitative study. The qualitative study characterises of the person who are doing the work. When working with qualitative studies it is good to do constant analysis, compare to quantitative studies where the main work is done when all material is gathered. This can give continued ideas about how to go further. We have during our work tried to work on the answers when we have received them, this has lead to new questions and we have been able to form new aspects to our thesis. All the time we have also got new information from Ericsson that has led to new directions in our work. An example of this is all the new information that we received concerning the paradigm shift, which meant that we had to change a lot and think in another way. Our supervisor at Ericsson was not completely sure about what was happening so once he got new information about what was going on, our first conclusion was not relevant anymore.

3. THE DIFFERENT ACTORS

To continue our work about the telecom industry we have to first look at what it contains. Therefore this section is about the actors we have looked at and what actually is happening in the industry with its players.

3.1. What's happening?

We have distinguished and delimited us to six different roles in the mobile telecom industry:³⁵

- *Content providers* provide the raw information content for the mobile Internet and are typically either current Internet content providers or businesses that wish to target mobile customers. They see mobile as an additional channel for spreading their content. An example is CNN that provides news to the user's mobile phone.
- *Application and service providers* deliver applications and services required by mobile users, for example email services, booking and reservation systems, billing and transaction processing, and Short Message Service (SMS).
- *Content aggregators or portals* combine and deliver content in a format suitable for target customer groups. This role is very diffuse to define because most of the players in the value chain need to offer and play a portal role if they have an end-user interface/site. They are typically either existing Internet 'portal' providers, or 'news' services that gather and manage content. The mobile portals differ from the traditional portals on the web since they have high-level of personalisation and contextualisation of the information.³⁶ The Swedish newspaper Aftonbladet's portal is an example in this category. They aggregate services and content to the end user.
- *Terminal and infrastructure vendors* are leading the development of mobile technologies such as platforms, networks, and terminals. They are also marketing innovative products and turnkey technical solutions. This is Ericsson's role.
- *Mobile network operators* 'own' the customer because they provide mobile communication services through the operations of their own mobile infrastructure. They have expertise in data transport, network management and billing procedures, but they are not able to develop new content and services themselves. As a result of this a number of them are creating partnerships with content and service providers.³⁷ Telia is an example of a mobile network operator in Sweden.
- *The end-user* is the one that buys and consumes the products or services that are offered.

3.1.1. New Roles for Existing Players

As shown in the figure the players in the telecom industry are extending their positions in the value chain. We will discuss this evolution and show evidence from the real world.

³⁵ Computer Science Corporation (CSC), *The 2000 3G mobile phone study tour*, 2001

³⁶ Jeremy Matthews et.al, *Wireless internet business models: global perspective, regional focus*, 2001

³⁷ Ibid.

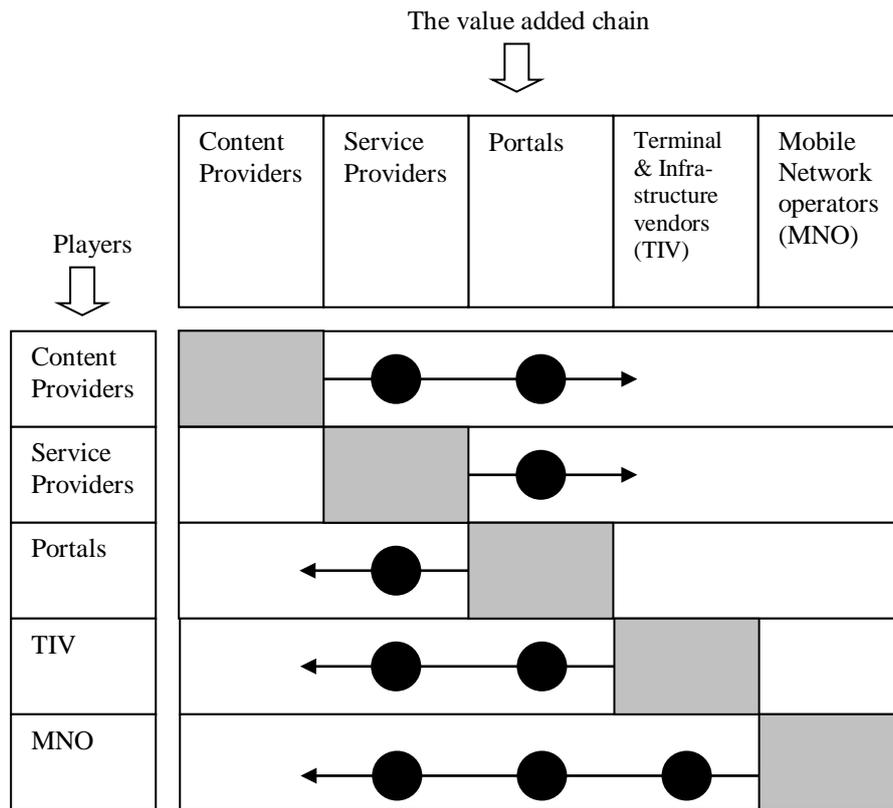


Figure 3-1 *The changes of the players in the telecom industry*³⁸

3.1.1.1. Evolution of the Role of Content provider, Service provider and Portal

The content and service providers are now developing mobile portals with worldwide coverage in order to expand their distribution channels. Some content providers are also seeking to become mobile service providers, which mean that they can market their services directly to the networks and also to the manufactures. Many existing portals operators are also developing themselves as service providers.³⁹

3.1.1.2. Evolution of the role of Terminal & Infrastructure vendors

More and more manufactures are seeking a position lower down the value chain and are taking the role as service providers and portal operators. Some of them have for example position themselves as Wireless Application Protocol (WAP) portal host and can therefore gain better knowledge of subscribers and the way they use their mobile devices. The manufactures state that the reason their portals have been created is to promote the sale of equipment, terminals and WAP applications. However, by doing this they are also competing with network operators and are positioning themselves as portal operators, content aggregators and even as service providers.⁴⁰ An example of this is the

³⁸ Jeremy Matthews et.al, *Wireless internet business models: global perspective, regional focus*, 2001

³⁹ Ibid.

⁴⁰ Jeremy Matthews et.al, *Wireless internet business models: global perspective, regional focus*, 2001

manufacturer Nokia with its portal “Club Nokia”. This portal helps Nokia to provide additional services, for example ring tones and games, to Nokia mobile phone owners.⁴¹

3.1.1.3. Evolution of the role of Mobile Network Operator

The operators are now also becoming service providers and are introducing own services such as downloading ring tones, logotypes and pictures via SMS, in order to compete with other service providers. Telia is for example doing this and they have an advantage since they can charge half the price compare to what other service providers are charging. They are able to do this since they do not have to pay an operator for using the network, as ordinary service providers must do. However this might lead to a problem, the high costs for the other service providers may lead to that they do not have enough money to develop new services. The service providers may therefore disappear and the operators will get lower traffic in their networks since no new services will be developed.⁴²

Another approach for the operators in order to extend their businesses is to develop their own mobile phones. This will help them profile their own services. Magnus Ahlberg at Microsoft states that every operator will have their own phones with their brand names on within a year. This was not needed when the market was just about talking, but now there are several new functions, like games and WAP, that the operators want to provide their customers with. Microsoft is investing in the mobile world by creating operative system with an interface that is similar to Windows. They will then compete with Nokia and Ericsson and the others in the Symbian alliance.⁴³ Microsoft strategy for succeeding is to create strong alliances and to get around their competitors, such as Nokia and Ericsson, and to enter the market via the operators.⁴⁴

3.1.2. Emerging New Roles

There are also new players that are emerging in the telecom industry, they are called mobile virtual network operators (MVNO). They are a result of the new law about telecommunication that was introduced in Sweden year 2000. The new law says that all companies that want to sell mobile services have the right to buy over-capacity in the operators’ network.⁴⁵ According to Christer Palmgren at Spinbox, there are three main categories of MVNOs. The first are the leading fixed operators that are trying to complete their business with an own mobile service. The second are companies, who already have a strong brand image and an established billing relationship to their customers. Examples of such businesses are banks and insurance companies. The third category is “lifestyles companies” where the members will buy the mobile services as a way of showing loyalty.⁴⁶ We also see a forth category which include new start-up companies that are established with the purpose of being an MVNO for example Campuz Mobile. They offer mobile services to students and collaborate with the operator Vodafone.⁴⁷

⁴¹ www.nokia.se

⁴² Computer Sweden, *Mobiloperatörer får kritik för prisdumpning*, 2001

⁴³ www.symbian.se

⁴⁴ Computer Sweden, *Microsoft siktar på operatörerna*, 2002

⁴⁵ Computer Sweden, *Öppning för fler aktörer på mobilmarknaden*, 2002

⁴⁶ Ibid.

⁴⁷ www.campuzmobile.com

4. THE RISE OF B-WEBS

Another theoretical background we need is about business models and value chains. In this part we will therefore describe what a business model is and we will focus our discussion on one important part of the business model; the value chain. As new technologies emerge the value chain changes and the traditional linear value chain may not be the most appropriate. This makes it harder for a company to choose the most suitable strategy since there are more situations and aspects to take into consideration. A result of the changing value chain is the rise of business webs and we will describe five types of these b-webs. We will end this section by describing the value flow in the telecom industry.

4.1. What is a Business Model?

A business model describes how a company makes money. It illustrates how the company uses its resources to offer customers better value than the competitors. A company can make money in two ways. The first is to add value that customers are willing to pay for and second is to have the lowest possible cost.⁴⁸

According to Allan Afuah a business model consists of eight elements that are essential in the company's money making. They are:

- *Customer value:* The company has to offer the customer something different than what the competitor offers in order to get the customer to buy the product or service.
- *Scope:* It is about to which market segments or geographic areas the value should be offered and how much of the market's needs it can serve.
- *Price:* The company must price the product in an appropriate way in order to get the right profit.
- *Revenue sources:* The company need to determine the sources of the revenues and profits.
- *Value added activities:* A company must perform activities that support the offered value. A set of connected activities is called a value chain since value is added to materials or knowledge as it moves up the chain.
- *Implementation:* It is important for the company to actually carry out the decisions.
- *Capabilities:* In order to perform the activities that strengthen customer value the company needs resources. The resources have to be converted into something that customers want. This ability is usually called a capability or competence.
- *Sustainability:* It refers to the ways a company can sustain its competitive advantage. There are three strategies that a firm can chose from: block, run and team-up.

⁴⁸ Allan Afuah et.al, *Internet Business models and strategies*, 2001

A business model can also be seen as the entire system for delivering utility to customers and earning profit from that activity.⁴⁹ In other words it is the totality of how a company selects its customers, define and differentiates its offerings, defines the tasks it will perform itself and those it will outsource, configures its resources, goes to market, creates utility for customers and captures profit.

There are also other ways to look upon business models. Like for example Timmers who defines a business model as following:⁵⁰

- An architecture for product, service and information flows, including a description of the various business actors and their roles
- A description of the potential benefits for the various business actors
- A description of the sources of revenue

This definition differs from the two that we mentioned above since it includes a description of not only one company's benefits but a description of all actors involved. This makes it more interesting for our investigation since we want a full view of the benefits the XML Web Services can bring to the actors, in other words not just seeing it from a single company's point of view but from the whole industry.

However there is still one issue lacking in the definitions above. We think a business model also should include costs. The reason is simple; a company could receive great revenues but if it has large costs that will not be covered by the revenues it will not survive. So as an additional point in a business model we want to see how the companies deal and handle the costs.

4.2. Value Chains – the Framework of the Economy

The value chain is an important part of a business model. It is the framework of the economy and has always been seen as linear and supply-driven. Every company is a part of a value chain, where its goods and services flow. The company buys goods and services from their suppliers, adds value, and sells to customers. The result of the business processes in a value chain is value delivered to the customers. The margin or “value” is the difference between what customers are willing to pay and the cost of producing the value.⁵¹ A company has to add value in some way to their products/services in order to get customers willing to pay. This is called *value configuration*.⁵²

4.2.1. The Linear Value Chain

Porter⁵³ means that the value chain is a way to organise the activities that add value. Adding value in many businesses involves the transformation of “raw materials” into a tangible product. There are several areas (the figure below) to which a manufacturer can add value. These activities are called the *primary activities* of the value chain because

⁴⁹ Adrian Slywotzky in Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

⁵⁰ Paul Timmers, *Electronic commerce*, 1999

⁵¹ Ronald Aronica et.al, *The death of E and the birth of the real new economy*, 2001

⁵² Allan Afuah et.al, *Internet Business models and strategies*, 2001

⁵³ Michael Porter, *Competitive Strategy*, in Allan Afuah, Christopher L. Tucci, *Internet Business models and strategies*, 2001

they contribute to getting the product or service closer to the customer. The primary activities are most closely associated with transforming inputs into outputs and with the customer interface – the most important additions to value in the short term. According to Porter the value chain also consists of the *secondary (support) activities*, which are business processes that support the primary activities. These include a company’s infrastructure, human resource management, technology development, and procurement.

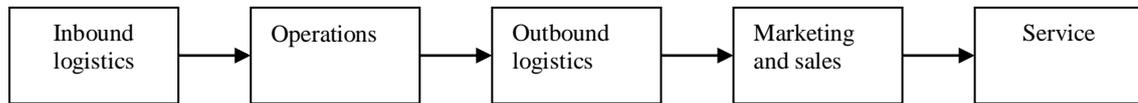


Figure 4-1 A typical value chain proposed by Michael Porter⁵⁴

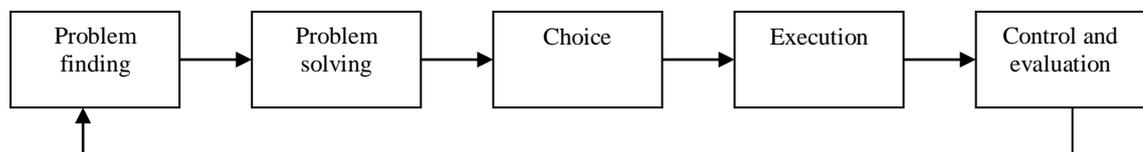
4.2.2. Value Chain, Value Shop and Value Network

According to Tapscott⁵⁵ there are two different types of value chains: *the value chain with routine production* and *the value shop with shop production*. They differ from each other since the last one is not based on routine activities and is driven entirely by demand, which means that the end-customer initiates the value-creating cycle. The value shop also differs because their customers usually participate in the design, and sometimes the delivery, of the solution.

Stabell and Fjeldstad⁵⁶ propose that Porter’s value chain is not appropriate for all businesses and is not always useful when searching for competitive advantage. They base their proposals on James Thompson’s⁵⁷ typology of organisational technologies, which he has categorised into long-linked, intensive, and mediating.

A *long-linked technology* is based on interdependencies and tasks are accomplished one after another. A typical example is continuous chemical processes, where one task has to be complete before another task can be started. This is what Stabell and Fjeldstad call value chain.

An *intensive technology* is oriented toward solving highly specific problems in real time and Stabell and Fjeldstad call it *value shop*. A company concentrates on discovering what the client wants, figure out a way of deliver value, determining whether the customer’s needs were fulfilled, and, if necessary, repeating the process all over again. An example is the hospitals’ primary business to heal people. The primary activities of the value shop are shown in the figure below.



⁵⁴ Allan Afuah et.al, *Internet Business models and strategies*, 2001

⁵⁵ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

⁵⁶ Charles Stabell et.al, *Configuring value for competitive advantage*, in *Internet Business models and strategies*, 2001

⁵⁷ James Thompson, *Organisations in Action*, in *Internet Business models and strategies*, 2001

Figure 4-2 Primary activities of the value shop proposed by Stabell and Fjeldstad⁵⁸

According to Stabell and Fjeldstad, a *mediating technology* contributes with value through a *value network*. Companies competing in the value network model facilitate transactions between diverse communities, for example, by bringing buyers and sellers together, and make money by doing so. The role, which is facilitated by mediating technology, can be named intermediary service.

4.2.3. The Business Web

Aronica and Fingar⁵⁹ mean that when new technologies emerge the companies start to redesign their business processes. When companies then embrace the Internet they start to redesign their business processes outside the company boundaries. The Internet blows the value chain to bits and makes the value chains customer-driven. The result is a value web, which is a web of any-to-any connections that uses the Internet for their primary business communications and transactions. This value web, we see as an extension of the value network and the same as Tapscott's⁶⁰ b-web. When customers interact, sourcing and direct procurement can occur in real-time. In b-webs customers have more power than ever before. Several b-webs may compete with one another for market share within an industry.

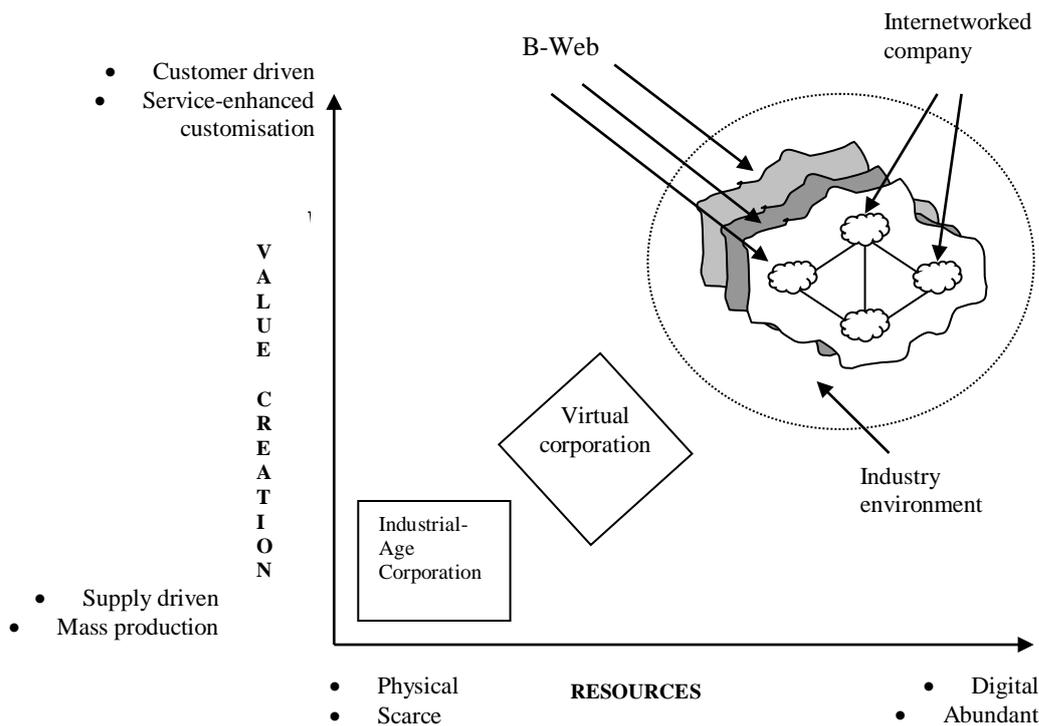


Figure 4-2 Three phases to B-Webs⁶¹

⁵⁸ Allan Afuah et.al, *Internet Business models and strategies*, 2001

⁵⁹ Ronald Aronica et.al, *The death of E and the birth of the real new economy*, 2001

⁶⁰ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

⁶¹ Ibid.

We think that this is not appropriate to all kind of businesses but it fit well into the telecom industry and it is at this stage the need for Web Services emerges. We also consider Porter's approach to be a good theory to use for further development, since the concept of adding value is still relevant. However the linear value chain does not suit all kind of businesses.

4.2.3.1. The Rise of Value Threads

Another drawback with Porters theory is when new technologies are emerging it changes the way business are conducted. This is a frequent phenomenon in the 21st century and the businesses adapting the new technologies are not suitable to Porter's linear value chain theory. For example when Internet has emerged the role of the customers has changed. This change has occurred across three dimensions: *power*, *specificity*, and *activity*. Now customers have more choices and power, which affect prices and profitability for the companies. They are also increasingly unwilling to compromise since they have more abilities to customise their products and services. Today customers are also more active than before, and also thanks to Internet they can get more information. As digital tools continue to increase, companies can take advantage of customers' growing activism to benefit both parties. They can create additional value by making it easy for customers to help themselves without reliance on company talent.⁶² These changes make it even more important for companies to look over their value chain. The power factor for future success is in the companies' value chain. Companies that realise this know that they have to turn their company and their whole value chain into the command and control of the customers.⁶³

There must be a unique value chain for each customer and transaction since mass customisation and personalisation is so important nowadays. However there may also be a need for serving multiple customers over a long time. A company must therefore be able to manage both kinds of value chains, in other words, the value chain must be more customised and tightly focused in order to meet the customers needs. To optimise the value chain the company has to establish win-win relationships, not just within the company but also to their trading partners. Companies cannot just act alone, they need their partners. When this happen the value chains become *value threads*, which can be seen as temporary value chains.⁶⁴

Value threads are woven into any-to-any connections that exist in the b-web. They can change in response to the changing market conditions. It gives the company the opportunity to participate in multiple marketplaces or reach out directly to customers. If the company wants to be successful they have to manage and optimise multiple simultaneous value threads.⁶⁵

Collaboration makes it possible to create customer-driven value threads, by matching demand and supply channels. This will result in reduced cost of doing business across company boundaries and the companies can easier respond to market needs and make decisions based on who can deliver the required products or services at the right price, quality and places.⁶⁶

⁶² Adrian J. Slywotzky et.al, *How digital is your business?*, 2000

⁶³ Ronald Aronica et.al *The death of E and the birth of the real new economy*, 2001

⁶⁴ Ibid.

⁶⁵ Ibid.

⁶⁶ Ibid.

As everything becomes ecosystems, the companies have to meet a new kind of competition. Today the companies are not competing against each other; instead they are competing value chain versus value chain and the company has to manage multiple simultaneous value chains.⁶⁷

4.2.3.2. Five Types of b-webs

According to Tapscott⁶⁸ there are five types of b-webs. We will describe those below and later in our analyse section we will apply these models to companies that are relevant to our investigation.

4.2.3.2.1. Aggregation

Aggregations work as intermediaries and organise and distribute products, services and information. They give both consumers and producers benefit. The consumer gain advantage since the aggregations select and organise products, set prices and help the customers match products to their needs. The producers benefit when the aggregations segment markets, which makes it convenient and easy accessible to the producers. The aggregations add value to the exchange process rather than to the products themselves. They can manage just about any product valued by the customer in any market. The products they sell are predetermined priced although it negotiation about the price do occur.

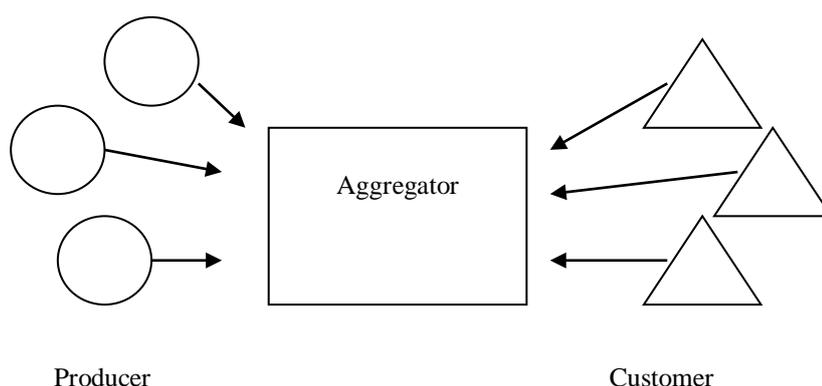


Figure 4-3 Aggregation b-web⁶⁹

4.2.3.2.1.1 Bol.se

An example of a Swedish Aggregator is Bol.se. They act as an intermediate between buyers and sellers. A customer can search for a book and get the price and availability of it. Bol.com does not have an inventory, they have a database from ten different information supplier. In these databases there are facts about different titles availability. Bol.com order then from the supplier and sends it to the customer.

In order to increase their clientele and to reward their loyal customer Bol.se offers their customer to be a part of a partner program. The customers register in the program and recommend bol.se to visitors that come to their own website. They will then be rewarded.

⁶⁷ Ronald Aronica et.al, *The death of E and the birth of the real new economy*, 2001

⁶⁸ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

⁶⁹ Ibid.

Bol.se will in this way get to know more about their existing customer and get new customers.

4.2.3.2.2. Agoras

An Agora is not an intermediary; they are a neutral third party, facilitating negotiation and transactions between buyers and sellers. Its core value contribution is creation, management, and regulation of the mechanisms for setting prices and allocating products. It is a real or virtual place where buyers and sellers enjoy collecting prices about products and services. The core value proposition of Agoras is liquidity, which means the ease of converting assets into cash.

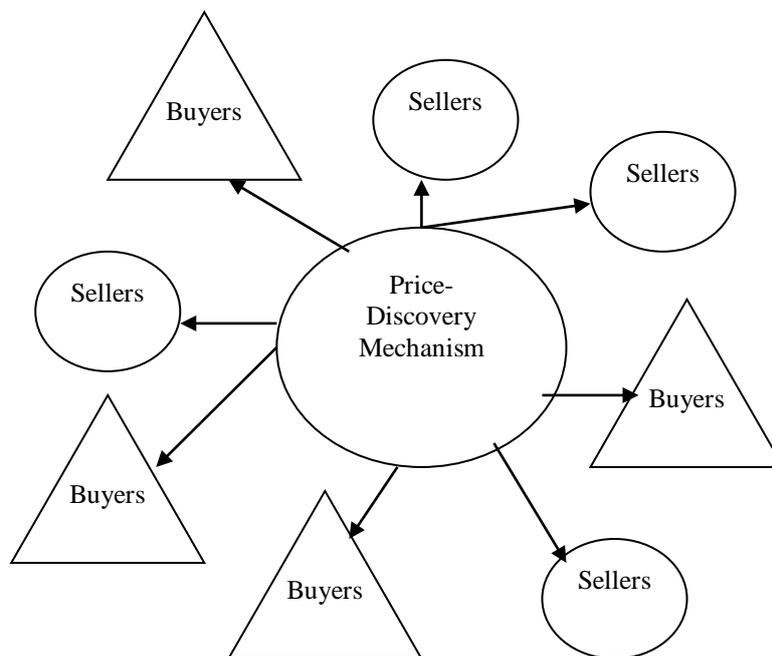


Figure 4-4 Agora b-web⁷⁰

4.2.3.2.2.1 QXL

A Swedish example of an Agora is QXL. It is a place where buyer and seller can meet in order to make business. It is a sell-side auction where the seller has a product that they want to sell and buyers make bids. The seller sets the lowest price and the market the highest. The sellers and buyers manage all of the transaction between them so QXL has nothing to do with it.

4.2.3.2.3. Value Chain B-Web

Value chain b-web design, produce and deliver products or services to meet customer needs. In a Value chain b-web the context provider leads the process and controls the design of the product and organise the key steps in the value integration. They are also the content provider.

⁷⁰ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

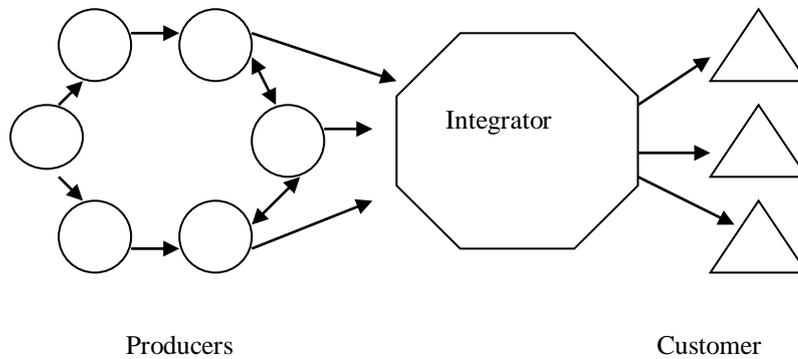


Figure 4-5 Value chain b-web⁷¹

The value chain used to be about vertical integration, where the company managed over all processes in the chain. It seemed cheaper to “make” instead of “buy” the product. But the vertical integration had its disadvantages. It made the companies inflexible and difficult to manage and they could not act to changes and innovations. It also destroyed the innovation and creativity of the firm’s human capital, which in the digital economy is crucial. The linkages used to be slow and expensive. Nowadays with the help of Internet technologies the linkages are improved and they make the value integration faster, better and cheaper. The companies do no longer do it all internally.

4.2.3.2.3.1 Ericsson

Ericsson is an example of a Swedish value-chain. They are the content provider who coordinate and control the design of the product. For example in their mobile manufacturing they collaborate with other companies and buy products and services in order to create a high-quality product for the customers. For instance the games in the mobile phone are not created by Ericsson, Massive mobile has for example done one of them. Ericsson is concentrated on the core value for the customers and lets the partners do the rest.

4.2.3.2.4. Alliances

This is the most virtual of all of the business models and is supposed to not have a hierarchical management. An Alliance’s context leader, whether a company or a person, begin the work and sets the direction. The value proposition is creative collaboration toward a goal shared across a community of contributors. Participants of an Alliance b-webs are people that together designs and makes useful goods and services, creates and shares knowledge, or simply produces dynamic group experiences. They can be seen as “prosumers” which means that they are at the same time both producers and consumers. The value they create enhance their own self-interests, and the bigger the network is, the more value it creates.

⁷¹ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

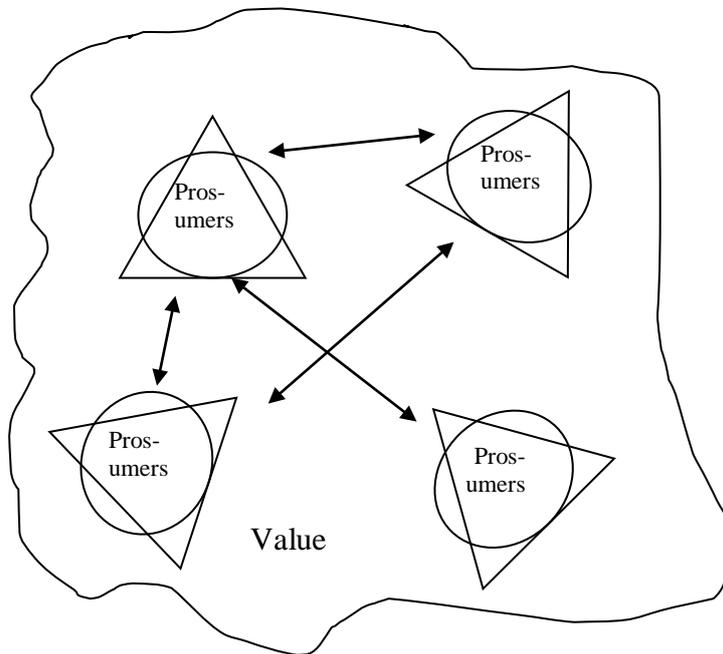


Figure 4-6 *Alliances b-web*⁷²

4.2.3.2.4.1 Lunarstorm

An example of an alliance is LunarStorm. That is a community place for the younger generation and has been one of the most popular in Sweden. From the beginning, before Internet was founded, it was just a look-a-like of our web communities and when Internet emerged, Lunarstorm was made to the first Internet community in Nordic. This hobby project got much attention because of the many desires of communicating through the net and the founder founded a web company. Every month there are about 928.000 visitors to the community and they have many new members every day that wants to be a part of the big community.

4.2.3.2.5. Distributive networks

Distributive networks make the exchange and delivery of information, goods, and services easier. They are the infrastructure of the entire economy. The businesses depend on the Distributive networks in order to be able to communicate with customers, suppliers, partners and employees. They are also needed to distribute goods and services and to facilitate money flows. The customers to Distributive Networks include both providers and consumers of goods.

⁷² Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

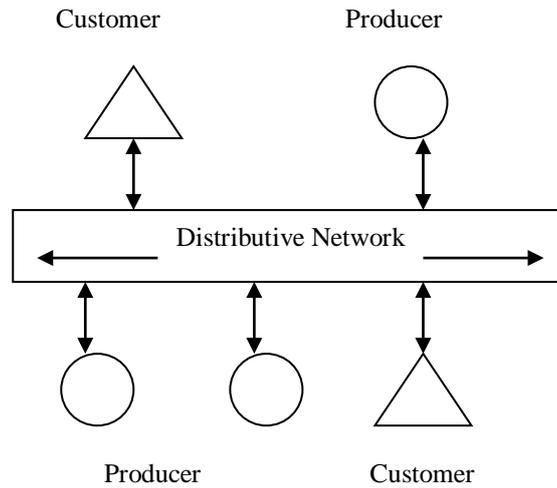


Figure 4-7 *Alliances b-web*⁷³

4.2.3.2.5.1 Telia

An example of a Distribution Network is the Swedish telephone company Telia. They used to be a regulated monopoly. However, this has changed, and now there are more players on the market to compete with. In order to keep up with the changes they have been forced to develop themselves.

⁷³ Don Tapscott et.al, *Digital Capital; Harnessing the power of business webs*, 2000

5. ANALYSIS – WEB SERVICES

In this and the following part we will examine and analyse the answers we have received from the interviewed individuals. We will start in this section by discussing Web Services and how the companies have adopted it, and we want to give the readers a better understanding about the technology. The second section will be a discussion on appropriate business models for Web Services. In the third section we will describe the paradigm shift in the telecom industry and the affect it has on the markets and we will end up by discussing business models in the telecom industry. In the analysis we will talk about Web Services both as a service a company can buy and as a technology that enables the development, production, and distribution of services in a new way. However, in our definition Web Services are defined as the last one, but we want to mention the other one since it is a good way to get ideas and better knowledge about the technology. To sell Web Services as services is a common use of Web Services now and therefore we want to start in this direction to get close r to our solution about how useful the technology is for the mobile Internet.

5.1. Why Web Services?

Web services seem to be gaining a lot of popularity amongst the programmers and the technologists, but what about in ordinary businesses? Is it just a new technology for the technologists or will it change companies' ways of doing businesses? To get a clear understanding about this we first have to explore what advantages and disadvantages Web Services have and how useful the technology is for businesses.

5.1.1. Advantages

The majority of our answers points out that Web Services have a lot of advantages, especially with the purpose of integrating different systems, which with the technology becomes much easier.

A whitepaper⁷⁴ from Hewlett Packard (HP) says that Web Services enable businesses to *improve collaboration* with customers, partners, and suppliers, since the integration time and cost will reduce. The technology will also *decrease the inventory and transaction costs* and *improve the efficiency in the supply chain*. According to Urban Bettag⁷⁵ at Reuters, the opportunity to integrate a company's technical environment into their customers and suppliers will also strengthen the relationships between them. HP⁷⁶ thinks it will also increase the customer service. Bettag agrees that organisations can personalise their services better with the help of Web Services and as a result *deliver better services*. Further he thinks that organisations can *rent services*, which means that they do not have to develop the services by themselves. ~~I We think that~~ this will *reduce costs* for the companies and as a result increase their revenues. However, many thinks that Web Services itself will not be revenue generators, but all its advantages will lead to more

⁷⁴ Hewlett-Packard (hp) White paper, *hp Web Services platform (business level)*, 2001

⁷⁵ Interview

⁷⁶ Hewlett-Packard (hp) White paper, *hp Web Services platform (business level)*, 2001

revenues. HP thinks that revenues will also increase because of expanded distribution channels, quicker time-to-market for new value-added services and enabling public discovery of existing assets. Bettag mentions these advantages too. He also thinks that if organisations standardise their integration with Web Services, organisations will reduce costs. By doing this HP means that it will protect investment and avoid technology lock-in.

What more advantages do Web Services have? Steve Christensen⁷⁷ at Babbleware states that Web Services is a unique technology since it enables companies to not have to rip and replace their existing systems with new systems, which before has been a fact. Companies now have a platform that will simplify their ability to change incrementally and not as a one-time change. Incremental change can then be directly aligned to benefits/Return On Investment (ROI). Each project can attack a specific opportunity and create real value.

Philip Hall⁷⁸ at Eastman thinks that Web Services will open up the capability of business-to-business over the Internet by providing capability to allow small and medium sized companies to start using the Internet as a real channel to market. However this is still some way off in terms of time and capability. Smaller businesses have never had the same possibilities in the business-to-business area since the precursor to Web Services, EDI, is very expensive and time-consuming to implement, as we have discussed in our problem formulation. The solution with Web Services can therefore give small and medium sized companies better opportunities in the business-to-business area than ever before.

The financial sector will also gain advantages with Web Services. Dirck Hecking⁷⁹ at Robertson Stephens has seen benefits with reuse and interoperability instead of increased revenues. He sees benefits in areas for market data providers. They have data that is widely dispersible and valuable that they make decisions on, decisions that eventually move the markets. If the market data providers are able to make their data more consumable by allowing the company/others to connect to them using Web Services, there could be a much better monitoring and more flexible use within a company of the data. They only need to write it once and can then use it everywhere. Because all the data is shipped over the Internet, there will also be a reduction in cost.

Arnim Whisler⁸⁰, strategy consult at Accenture, has analysed the seven most essential factors that will take us out from the recession. Web Services was presented as number two. It will reduce the costs for a company and with this as a driving force the development of Web Services will increase. Whisler states that Web Services in the long run can lead to closure of entire IT department. The operators will also push the development of Web Services since it takes up bandwidth. According to Gartner,⁸¹ companies increased use of Web Services will lead to 30 percent increased efficiency within IT development projects before year 2005.

⁷⁷ Interview

⁷⁸ Interview

⁷⁹ Interview

⁸⁰ Computer Sweden, *Datacentret lämnar företaget*, 2002

⁸¹ Andrews Whit et.al, *"The Hype is right: Web Services will deliver immediate benefits"*, 2001

To sum up, Web Services' advantages can be seen as a spiral, one thing leads to another that leads further to another thing etc. For example the integration possibilities lead to better collaboration, which in turn lead to reduced costs and further to new revenue opportunities. As a result the profit may increase. Web Services can do much for businesses, and, according to Whisler, to our entire economy. However, no good thing comes without a bad thing. Web Services have a lot of disadvantages too. We will discuss these further, since it enables us to get a wide perspective over what Web Services can do and not do. Next we will discuss the disadvantages. This will eliminate any bias that the technology can handle everything.

5.1.2. Disadvantages

Despite the advantages mentioned above, Web Services are not without any disadvantages. The main issue is the *security problem*, which has not been solved yet. By security we mean the protection against unauthorized reading, modification, or destruction of information. Another concern is privacy, the right of individuals to have control of their personal information.

Many companies are working behind firewalls because the problems with security and reliability.⁸² E-business needs for example authentication, encryption, integrity and non-repudiation.⁸³ There are also questions concerning how the companies can make sure that Web Services work correctly all the time and who shall be responsible if the system does not work.⁸⁴ Another thought about Web Services is that it is *just a fad* and it will not be able to manage everything that people expect it to do.⁸⁵

The majority of our answers show that the security issue is a big problem. According to an article provided by Dieter Jenz,⁸⁶ security standards need to move forward fast since with incomplete and immature standards, the inter-company infrastructure will remain unchanged. The entire software industry must continue to work hard on pushing public standards forward, which are accepted and implemented by all software vendors.

Bettag thinks that *standards* are one problem and that there are too many isolated efforts going. At the same time leading vendors, such as IBM and Microsoft, try to come up with a specification for a problem, which need to be explored first. The motivation is mainly based on the fact to gain some more market share.

According to the analysis company Gartner the companies are *not mature* for Web Services yet and there are few users who know how to use it. This indicates that it is hard to draw conclusions if Web Services will benefit the companies or not. Before they can take advantage of Web Services the companies have to make a lot of changes, changes that every company have to make when implementing a new technology.⁸⁷ Business culture will for example have to change before companies are ready to let their systems buy services automatically.⁸⁸ Here the security plays an important role too.

⁸² Computer Sweden, *Enklare kommunikation över Internet*, 2002

⁸³ Dieter Jenz, *A view at Total Cost of ownership and return on investment*, 2002

⁸⁴ Computer Sweden, *Enklare kommunikation över Internet*, 2002

⁸⁵ Computer Sweden, *Web services förmåga är överdriven, säger Oracles vd*, 2002

⁸⁶ Dieter Jenz, *A view at Total Cost of ownership and return on investment*, 2002

⁸⁷ Computer Sweden, *Web Services dröjer till 2004*, 2002

⁸⁸ Adrian Mello, *Getting down to business with Web Services*, 2002

As we will see in the next section, the issue concerning security is really important for the companies. It has hindered them to take Web Services one step further.

5.2. Timeline for Profits and Value Creation

The first step companies have to take when adapting Web Services is to learn how to connect essential systems inside the company. It is quite common that there are many different systems that have been developed during different time-periods and built on different technologies. These systems contain information that is not easily converted or removable. Web Services have the advantage to connect those systems in a flexible way. After that companies are ready to connect external.⁸⁹

The main challenge now is that a lot of companies' partners do not have enough tools that support Web Services. Another reason why companies are not working with public Web Services is that completely open services can increase the risk for security and reliability problems.⁹⁰

According to an article provided by VAWSS⁹¹ a timeline has been made to see the profits and value creation in Web Services. This timeline is useful in order to decide in what position the companies are today. The timeline has four stages. The first stage is called "*Behind-firewalls market*", and in this stage the companies are saving money by integrating more cheaply. The companies, which are making the profit, are IT services and platform providers.

The next stage is when companies start to *integrate with partners*, where they extend and improve their IT relationships with existing business partners. Profits will come from new Web Services solutions and products that start to emerge, as well as large IT services companies who can bring their customers together.

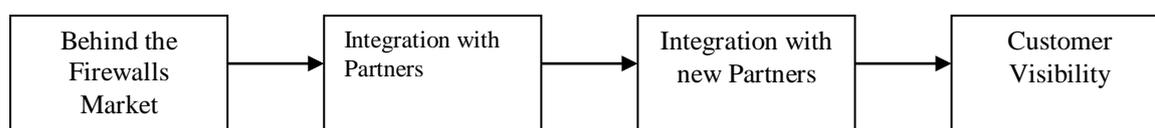


Figure 5-1 *Timeline for profits and value creation in Web Services*⁹²

The third stage is when companies start to *integrate with new partners*. Web Services can be exchanged with 3rd parties without a prior business relationship and services become gradually more specialised. Web Services marketplaces will profit by creating meeting places where Web Services can be bought, sold, and managed. Profitable marketplaces will come from small early upstarts, as well as larger Web solution products and solution companies.

The last stage is *customer visibility* where Web Services not only improve the cost and delivery of current services, but services themselves are reengineered. End user will

⁸⁹ Computer Sweden, *Web Services lyckat när man börjar smått*, 2002

⁹⁰ Computer Sweden, *Web Services bygger broar mellan systemen*, 2002

⁹¹ Value added Web Services supplier (Vawss), *Who is going to make money in Web Services?* 2002

⁹² Ibid.

customise and “build” their own interactions with the companies. Companies will derive substantial competitive advantage and profit by allowing end customers to control and in some cases construct their own services. For example telecom companies could let consumers design, share, and consume their own communication services for instance. This is the stage where our research is based. It seems to be a long way to go but it can also get there very fast. Therefore it is essential to investigate a company’s opportunities with Web Services. Even more important is it to investigate an industry’s opportunities, in our case the telecom industry.

Now when we have looked at this time line, we also want to see how well it has been adopted. So we will start by describing the technology adoption life cycle and then determine where it is at..

5.3. Timing

A business model or strategy that works early in the evolution of a technology may not be appropriate when the technology is mature. The same goes when a company is the first in the market compared to when a company is a follower. So it is really important to consider timing when deciding a business model or strategy. It is also useful to see what kind of customers a technology attracts during its life cycle.⁹³

5.3.1. The Technology Adoption Life Cycle

The technology adoption life cycle model is a model for understanding the acceptance by the customers of new products. There is a lot of value in the technology adoption life cycle as a marketing model. The model describes the market penetration of any new technology product in terms of a progression in the types of consumers it attracts throughout its useful life. By dividing the customers into groups based on when they tend to enter the market, it gives a clear guidance on how to develop a marketing program for an innovative product.⁹⁴

The model has a bell curve and the divisions in the curve are roughly equivalent to where standard deviations would fall. The groups are distinguished from each other by their characteristic response to a discontinuous innovation based on a new technology. Each group represents a unique psychographic profile, a combination of psychology and demographics that makes its marketing responses different from those of the other groups. Understanding each profile and its relationship to its neighbours is a critical component of high-tech marketing knowledge.⁹⁵

⁹³ Allan Afuah et.al, *Internet business models and strategies*, 2001

⁹⁴ Moore et.al, *Crossing the chasm*, 1999

⁹⁵ Ibid

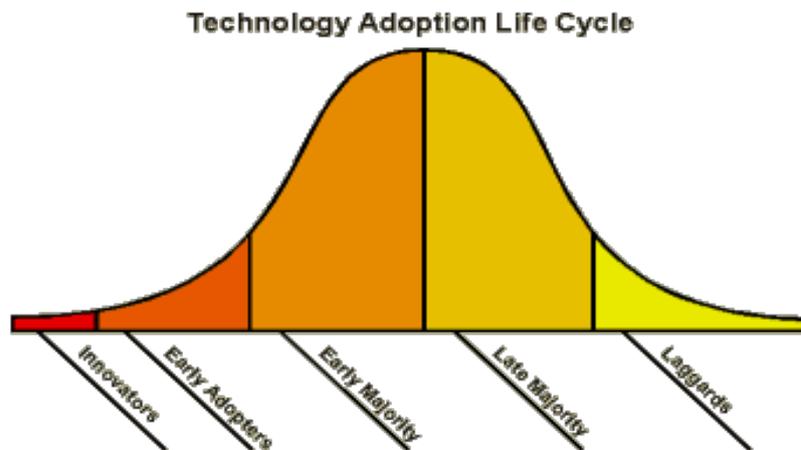


Figure 5-2 Technology adoption life cycle⁹⁶

The consumers can be divided into five groups:⁹⁷

- *Innovators*, also called technology enthusiasts or just “techies”
- *Early adopters*, also called the visionaries
- *Early majority*, also called as pragmatists
- *Late majority*, also called conservatives
- *Laggards*: also called skeptics, are like the name.

Innovators and early adopters together make up the *early market*. They are very equal since they both want to be the first using and/or implementing the technology, but there are some issues that distinguish them. The early adopters are not technologists like the innovators; rather they are people who find it easy to imagine, understand, and appreciate the benefits of a new technology, and to relate these potential benefits to their other concerns. In other words we can say that innovators desire to *explore* and the early adopters desire to *exploit* the new capability.⁹⁸

The *mainstream market* consists of early majority and late majority. The technology has to prove that it is not just a technology and that there are practical issues with it too. Both the early majority and the late majority are waiting to see what others in the market are doing since they know that some technologies can just be fads. However, these two categories distinguish in one way. Whereas early majority are comfortable with their ability to handle a technology product they are more likely to decide to purchase it. Late majority are not. They wait until something has become an established standard and even then, they want to see lots of support, and therefore they often buy from large, well-established companies.⁹⁹

The laggards simply do not want anything to do with new technology and will just buy it when it is buried so deep inside another product, for example that a microprocessor is designed into the braking system of a new car, which they do not even know it is there.¹⁰⁰

⁹⁶ Moore et.al, *Inside the tornado*, 1999

⁹⁷ Moore et.al, *Crossing the chasm*, 1999

⁹⁸ Ibid.

⁹⁹ Ibid.

¹⁰⁰ Ibid.

The basic drawback in the model is that it involves a smooth and continuous development across a product's progression segments but experience shows the opposite. Making the marketing and communications transition between the different segments is not normally easy to do. Companies must develop new strategies just at the time when they were getting comfortable with the old ones. The biggest problem during this transition time is the lack of a customer base that can be referenced at the time of making the transition into a new segment.¹⁰¹

5.3.1.1. The Chasms in the Curve

In the technology adoption life cycle there are chasms between every changeover to another category. The biggest and hardest chasm is between early adopters and early majority since they are dissimilar in many ways. Technologies are being welcomed in the early market and then fail in the chasm where the sales falter. If the technology is able to cross the chasm, it will gain acceptance within the mainstream market.¹⁰²

The early adopters' purpose with buying the technology is that they want to change their company and to gain competitive advantage. What the early adopters are buying is some kind of change vehicle. They expect a big difference between the old way and the new way. Being the first, they are also prepared to bear with the inevitable bugs and glitches that accompany any new innovation on the market.¹⁰³

By contrast, the early majority want to buy a productivity improvement for existing operations. They do not want a big difference between the new way and the old way and they do not want to find any bugs in the system. The system should be working good and without any errors.¹⁰⁴

Because of these incompatibilities, early adopters do not make good references for the early majority. The early adopters are giving much publicity about the technology, but it is not the right type of information for the early majority. The early majority do not start to use the technology until another early majority can give good references about it. They all think in the same way and this will cause a bad circle. Many unwary start-up ventures have fallen into this chasm.¹⁰⁵

5.3.1.1.1. Crossing the Chasm

How do a company cross this chasm? The most important thing is to understand the difference between the early adopters and the early majority. Whereas the early adopters are satisfied by seeing the beginning of a solution the early majority need the complete product. They are not satisfied until they can see a 100 % solution. So in order to cross the chasm the company should focus on a single target customer and make sure that the product meets the customer needs 100 %. If the company instead develops a product that has a little bit of everything that different customers want it will lead to that nobody of the early majority wants to buy the product, since it does not meet every single desire. In other words, the winning strategy is to identify a single segment of customers and in that

¹⁰¹ Moore et.al, *Crossing the chasm*, 1999

¹⁰² Ibid.

¹⁰³ Ibid.

¹⁰⁴ Ibid.

¹⁰⁵ Ibid.

way getting a niche-based adoption in the mainstream market. Once the company has managed this they are able to increase their customers' base and achieving a mass market adoption.¹⁰⁶

5.3.2. Position of Web Services – today and tomorrow

The majority of the people we interviewed think the technology is still in an early stage in the timeline.

Most of the interviewed people also point out that Web Services development today is in-house integration projects, EAI (Enterprise Application Integration), in other words stage one in the timeline discussed above. Some companies have also come to stage two where they have integrated partners in their systems such as b2boost.¹⁰⁷

Robertson Stephens is an investment-banking subsidiary of the FleetBoston financial group.¹⁰⁸ Dirck Hecking,¹⁰⁹ Vice President of e-commerce at the company, tells us that they embraced Web Services last summer as an integration solution for allowing Microsoft and Java technologies to interoperate. Currently they are focused internally, but may one day include a third party for payment in their service. They use the technology internally because of the nature of their business and the youth associated with the new technology. In the future they plan to share their Web Service hub concept with other areas of the firm, in particular market data and corporate data.

Tom Murphy¹¹⁰ at Cape Clear sees the initial demand for Web Services technology inside organisations. Cape Clear is primarily focusing on the integration of new and existing applications using Web Services, for example Customer Relationship Management integrated with Financial System. As Web Services mature, he expects a wider deployment outside on the Internet. He thinks at this stage there will be a large uptake of commercial Web Services.

Another thought concerning Web Services being in its early stage comes from John Blair, CEO at Kenamea. He pronounces in Computer Sweden that companies have been successful in implementing the business process behind the firewall, and that the next step is to go outside the companies' boundaries. However, they cannot do this until they have provided and accomplished a policy for internal communication.¹¹¹

Urban Bettag¹¹² at Reuters thinks Web Services are in its early stage since it is mainly used internal and not fully for B2B integration. He means that if products/services are grouped into information, transactional and datastreaming products/services, Web Services today can be used only for information products/services and partly for transactional products/services. An informational service can be a stock quote service, which deliver the latest asked price for a stock. A transactional service is usually a part of a long running business transaction, like for example a purchase order.¹¹³ Data streaming

¹⁰⁶ Moore et.al, *Inside the tornado*, 1999

¹⁰⁷ B2boost is one of the companies we interviewed.

¹⁰⁸ www.capeclear.com

¹⁰⁹ Interview

¹¹⁰ Interview

¹¹¹ Computer Sweden, *Web Services lyckat – när man börjar smått*, 2002

¹¹² Interview

¹¹³ Urban Bettag, *Web Services revisited*, 2001

is a technique for transferring data so that it can be processed as a steady and continuous stream. Streaming technologies are becoming increasingly important with the growth of the Internet because most users do not have fast enough access to download large multimedia files quickly.¹¹⁴ Bettag thinks at the time streaming is a bit difficult and it will take some more time to come up with compression protocols and protocols for reliable messaging.

As we have already stated, Web Services can be used both internally and externally. However, Bettag thinks that externally Web Services has the most potential. Among other things, he consider this since Web Services quickly can assemble new products and services, project their technical environment into their customers and suppliers and as a result strengthen their relationships, and deliver better services by assembling customised business Web Services.

The technology is rather new and there is still uncertainty around it. As a conclusion we see that most companies are using Web Services internal but they are moving towards integration with their partners. Some companies have already started doing this. This phenomenon can, according to us, be compared to BPR and IPR where companies first started to reengineer business processes internal and after that continue to integrate outside the company's boundaries. The result, if it succeeds will be a business web with any-to-any connections, but now without any human interaction. Bettag compare, in the same way as we do, Web Services with Tapscott's business web. We will continue this discussion later.

5.3.2.1. Security

As we stated before the security issue is a big problem and one reason why many companies have not yet adopted the technology externally is the missing security standard. The mainstream market cannot adopt a technology if it is not secure. It has been much talk about the security of Web Services and it is still an unsolved issue. It will be hard for the technology to cross the chasm since this problem first has to be solved. The majority of the interviewed companies think that the security is the most important issue, but indicate that when the technology really is secure it will provide an extra layer of security. Michael Lane¹¹⁵ at Encompys thinks this is one of the factors that will give businesses value and growth. Steve Christensen¹¹⁶ at Babbleware argues that Web Services provides a model that can overcome a lot of security and trust issues.

Johan Lindén¹¹⁷ thinks that using Web Services is safe when the technology is used internal in the company. The problem arises when new players will be connected into the systems, and this is because of the unsolved issue about security.

Philippe Geleyn at B2boost,¹¹⁸ means that only new projects can at the time be built on secure Web Services, and pronounces that there on the other hand is no standardization yet about Web Service security.

¹¹⁴ www.webopedia.com

¹¹⁵ Interview

¹¹⁶ Interview

¹¹⁷ Interview

¹¹⁸ Interview

Based on this we see that the security is a crucial issue. If it is not being solved the companies do not want to use the technology. When integrating with other companies the company expose themselves in ways that they have not done before, so in order to adapt the technology they want to feel safe. People do not want to pay for technology if they do not know if it is secure or not.

5.3.3. Early Adopters of Web Services

Concerning the technology adoption life cycle we can say that companies involved with Web Services, in one way or another, are innovators or early adopters. This is obvious since the technology is just in its early stage. Companies in the software industry, which early provided tools to enable companies to create Web Services, we see as innovators since they were the once that started the development of the technology. The companies that have adopted the technology internal in their business or using tools to create their own Web Services and not just developing it are according to us early adopters. They have the belief that there is something more about the technology than just a technology, which they show when they are using it in their business. However, these two categories can be hard to distinguish, but it is obvious that the mainstream market has not yet adopted the technology, and will not adopt the technology until it reaches the end of the growth phase or the mature phase of the technology life cycle.

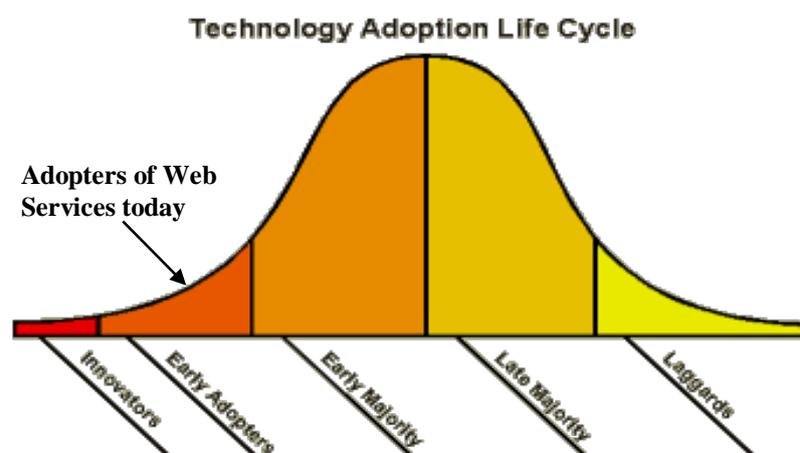


Figure 5-3 Technology adoption life cycle¹¹⁹

One example of a company providing tools to create Web Services is Cape Clear. Tom Murphy¹²⁰ tells us that they already have a small number of customers using commercial Web Services today. These companies can be divided into two categories:

- Those who already provide information to customers for a charge, and that are able to develop more sophisticated billing and delivery methods for that data.
- Those who own a lot of information and are now looking to sell that information.

However, Cape Clear's other customers are today undertaking integration projects that would have been too difficult, long or costly with existing technologies.

¹¹⁹ Moore et.al, *Inside the tornado*, 1999

¹²⁰ Interview

Murphy thinks that these two categories, mentioned above, will be early adopters of Web Services. The ASP model, where companies offer software online, may be the first widespread commercial applications for Web Services according to him. An example of one of their customer that is an information provider is a bank that already offers customers access to their research services online, which are in effect of Web Services. He also thinks that the initial successful commercial Web Services providers are likely to be offering services they already offer, but with Web Services it will be in real-time or, as Xmethods mentions, it will be as a new channel for their existing business.

We will now look at how and when the adoption of the technology will happen. This is important to analyse since it shows a business what to expect and when it can adopt the technology.

5.3.3.1. The Adoption

According to the analysis company Gartner, Web Services will not have a break through until the year of 2004 because of all the changes the companies have to make.¹²¹ This means that the business culture will have to change before companies are ready to let their systems buy services automatically. Most analysts believe that companies will buy Web Services in the same way that they buy other services on the basis of pre-negotiated contracts. The companies will also first use Web Services to improve data sharing with each other before they will create revenue streams.¹²²

Most companies that we have interviewed expect that commercial Web Services will take time mostly because of the security problem, and the technology may be widespread provided in about 12-18 months. Further, Christensen means that the course of time is likely 18-36 months for full adoption by a company and their partners, but he thinks that full adoption by all partners will never happen.

Christensen argues that businesses may be slow to adopt this technology simply because it is new and everyone is uncertain of the next new thing. But after a few businesses demonstrate success with a rapid, low cost, low risk solution that achieves measurable results, the market will quickly adopt this technology. If vendors can create solutions, not just currency converters or other such toys, business will be compelled to adopt this solution. This statement is the same as the message from the technology adoption life cycle concerning crossing the chasm and to reach the mainstream market. It will be a slow adoption but once it is adopted, more people will see the benefits from the technology and others will catch on.

According to Geleyn, another reason why the adoption of the technology will take long time is that many major actors in the various industries already have developed traditional solutions, for example EDI. These are based on services and infrastructures provided by private network providers; Value Added Network (VAN). The companies want to see return on their EDI investment, Geleyn thinks therefore the transformation will take long time, about five to ten years.

Christensen thinks that companies' exposing their business processes to the world outside will get a big cultural change. The customers will start to expect service levels and

¹²¹ Computer Sweden, *Web Services dröjer till 2004*, 2002

¹²² Adrian Mello, *Getting down to business with Web Services*, 2002

improvements and the vendors will be forced to provide them or risk losing market share. The customer will likely initiate the adoption curve as they become aware of better service models and the vendors will have to fall in line. However, there will still be resistance. Because of their incremental nature, it will be a progressive adoption that leads to real integration and business process streamlining.

Hecking¹²³ says that Web Services standards have to be adopted by the major software industry (application vendors, tools vendors, service providers) if it will be potential success. When enough tools have been created, which make the creation and consuming of web services easy, it will be the technology of choice for integration.

Murphy means that the technology however has more support than any previous middleware technology. Further he says that the commitment of the software industry means that Web Services is already becoming the standard for cross-application, platform interoperability. Murphy means that we are moving from hype to implementation.

To sum up, the adoption of commercial Web Services will take long time. It is hard to cross the chasm and reach the mainstream market since in order to reach them there is a need for acceptance by early majority. Based on the statements above this adoption will take long since there are already many companies that have invested in EDI solutions and are hesitating to make another investment. It is also important that standards are being created since this will simplify the creation and consumption of Web Services. Of course another main issue that has to be solved is the security question. It is important since the companies that have to perform major changes in the company when adopting the technology will definitely hesitate doing this if there are security problems. However, once the early majority has accepted Web Services and starts to benefit from it we see no reasons why the rest of the mainstream market should not adopt it as well.

5.3.3.1.1. Uncertainty

When searching for people to interview we have also reached people that are not familiar with the technology. One important observation is that these people hardly know what the technology is about. At the question: “What do you know about XML Web Services?” one answered:

“Isn’t it WAP?”

No, Web Services and WAP are not the same, and we will not go deeper into this area. However, this statement was not said by a technologist, but by a person with major skills in other areas. With this statement we want to say that the technology is rather new and everyone do not know much about it.

Another thought is concerning the dotcom crash that may have influenced people’s disbelief in new technologies and we agree to Christensen’s statement about this above. Moving towards Web Services is a huge change and people may be extra worried as a result of the dotcom crash. If the technology will manage the security problem and be as good as the technologists say it will be, the companies will sooner or later be forced to move towards Web Services. As a result of the uncertainty against new technologies the adoption may take longer than expected. Internal there is no problem with using the

¹²³ Interview

technology. The problem arises when companies start to integrate with other companies' systems. We have not done any deeper investigations in this area but we have discussed it since we want to give the readers an understanding about what is happening now and in the future, and why we are doing a research about new business models.

There is also uncertainty how companies will act against the technology. As Hecking mentioned, the major software vendors have to adopt the technology if it is going to be successful. Looking back on what Murphy said about that Web Services already is becoming the standard, it seems to be on good way.

6. ANALYSIS - BUSINESS MODELS

The changes in the telecom industry and the new technology, Web Services may change the business models. We have earlier discussed what a business model should include. We think the main elements to define are the pricing model, and the revenues and value flow between players in the value chain. The value chains that have any-to-any connections we have chosen to call b-web. Tapscott has defined five different b-web, which we have described before; agoras, aggregator, value chain, distributed network and alliances.¹²⁴ We will here discuss what pricing model is most appropriate for web services and later apply Tapscott's b-web to some examples of companies from the real world.

6.1. Pricing model

As we mentioned before Web services is in its early stage and it is hard to make money of a new technology during this stage. The financial rewards generally appear when the hype has settled and when organisations know how to benefit from the new technology and when they develop winning business models.¹²⁵ As a part of a successful business model it is important to look at the pricing model for the product/services.

6.1.1. For Web Services

A major problem for the developers today is the issue about how to best charge for their Web Services. Even though we are not focusing our thesis on the development of Web Services and how the software companies should best benefit, it is important to look at the different pricing models for software companies since it will help us in our investigation about finding an appropriate business model for using Web Services in the telecom industry.

Today most Web Services are provided free of charge. The developers' tools that are available make Web Services development easy, which means that the developers will be able to produce thousands of Web Services. However, the provider of free Web Services has no incentive to make sure their content is accurate, or that the service performs at reasonable level. Companies using Web Services in their business are unwilling to run these Web Services that cannot guarantee certain levels of service. It is therefore important to find ways to charge for Web Services. The providers need to make money in order to give customers the extra services such as support and reliability. It is also essential for them to make money so that they are able to develop new and better services.¹²⁶ So the question is how to charge for Web Services. There are six main alternatives when charging for software services:¹²⁷

¹²⁴ See the section: The rise of B-webs

¹²⁵ Value added Web Services supplier (Vawss), *Who is going to make money in Web Services?* 2002

¹²⁶ SOAP Web Services, *All you need to know*, 2002-04-26

¹²⁷ Value added Web Services supplier (Vawss), *What charging mechanism should we use for Web Services* 2002

- *Pay-per-use*: A user is charged a nominal fee for each time they use the service. The major disadvantage with the pay-per-use model is that the company is unable to accurately forecast revenues during a given time. The model can be implemented in two ways:
 - The *pre-paid* option has the advantage that it collects the money immediately. The disadvantage is when the number of calls has been used up and the user is denied services, which may make them angry.
 - *Micro-payment* is used when transferring money in very small amount and where the transfer revenue is smaller than transfer cost. One advantage is that infrequent users are more likely to pay 1-cent every time they want to use the service instead of paying a larger fee upfront since they are unsure of their usage habits.
- *Subscription*: A customer pays for unlimited use over a period of time. The advantage is that the company is able to set up automatic billing at the end of the period and it is easier to forecast revenues. If there is no automatic billing the company just need to remind the customer that the period is over, but a disadvantage then is that the customer may think they are not using the services enough and decides to end the subscription.
- *Lifetime*: A user pays an amount for the lifetime of the service. It does not have to mean literally forever, it can refer to a period, for example during the 2002 FIFA World Cup. The advantage of this charging model is realising the revenues immediately. The disadvantage is that there are no reoccurring revenues and the company is committed to support the services longer than they may wish to.
- *Free*: An advantage with providing a service for free is that it attracts customers. They may later be moved to payment plan. The disadvantage is of course the lack of revenues.
- *Free with hidden value*: A services is provided for free, but the company gets other useful value such as information about the customers.
- *Lease*: It is similar to subscription, but a short term leasing is geared towards providing high value services for a shorter period of time.

A company does not have to use only one of the charging methods mentioned above. There could be a combination, for example start with a free usage plan and then switch to a pay-per-use method. The company can either develop an own application to control the charging or they can use one supplied by a brokerage. There are two roles a brokerage can take. They can simply be a payment gateway and make sure that the money is being transferred. The other role is to facilitate the service level agreement, for example handling the billing and collection fee. They can also guarantee that the service is performing accurately.¹²⁸

6.1.2. In the telecom industry

After looking at these pricing models it is interesting to see what it look like in the telecom industry. Here are some options when charging for data transmission:¹²⁹

¹²⁸ Value added Web Services supplier (Vawss), *What charging mechanism should we use for Web Services* 2002

¹²⁹ Computer Science Corporation (CSC), *The 2000 3G mobile phone study tour*, 2001

- *Subscription charge:* This is like subscription mentioned above and can apply for the data connection or for a particular service. It is a likely option for network operators and content aggregators.
- *Data transfer charge:* It is the simplest option for network operators and it means that they charge for volume of data transmitted.
- *Pay per view mode:* It is like pay-per-use and is a likely approach for traditionally copyright and broadcast material such as music, video, sports, and real-time information.
- *Commission:* This is a convenient method for small value sales, particularly when the operator does the billing. It is most useable between partner companies and when handling products or services such as flowers or ticket. Operators may be reluctant to this approach when handling large sums since they are concerned about subscribers building up extreme monthly bills.
- *Transaction charge:* The same goes for this method, the mobile operators may collect the billing but they may be reluctant because of worries about high phone bills. The actors likely to use this approach are financial and banking services.
- *Specific agreement:* A combination of subscription and value based transaction charges are likely in the case of corporate service users. It is useful for transaction where the volume is low but the value of the connection is high.

6.1.3. The difference between the industries

The main difference we see between the pricing models currently used in the telecom industry and the ones suggested for Web Services is the operators' dominant role in the telecom industry. They have tried before to keep the relationship to the customers by them self by having subscription. They have acted as an autocracy ruler in the telecom industry and they have had control over the whole value chain. Without them the data transmission could not be carried out so they have to be involved when discussing pricing models. From our point of view, the operators seem to act as a payment gateway brokerage since they are the one enabling the billing process by letting customer pay via their phone bill. In the fixed Internet world the services and content can reach the customers without having to go to a third party, like an operator, and the payment can be taken care of between the service providers and end-user.

As we discussed earlier in the section about Mobile Internet, the players in the telecom industry are changing their position and new players are entering the market. This makes the operators' role more diffuse and they do not have the dominant role anymore. Austin Westerling¹³⁰ at Charles River Ventures compares the changes of the operators' role to what has happened to the Internet Service Provider (ISP). The customers had to, in the beginning of the Internet era, to pay the ISP in order to get access to the Internet. However, after a while new ISP emerged that offered free subscription and made the traditional ISP lose customers. An example of such players in the Swedish market is Telenordia,¹³¹ who charge for the access and Spray,¹³² who offer it for free. The operators are now anxious that the same thing may happen to them. They want to keep the billing relationship to the customers. An example of the emergence of new players in the telecom industry is the companies that arise as mobile virtual network operators

¹³⁰ Interview

¹³¹ www.telenordia.se

¹³² www.spray.se

(MVNO). The companies that offer free SMS are also making the operators feel threatened.

6.2. Examples of business model

There are not many companies using Web Services in their businesses today, so it has been hard to find real examples of business models. Most of our interviews have been with developers and the answers show that the technology is in its early stage and therefore it is hard to predict new business models. The technology is still in its early stage and from a company's point of view it is now time to develop and build new business models.¹³³ Since Web Services is in this phase it has been hard for us to get knowledge about existing business models. However, we have received a couple of examples of business models, including ways to charge the costumers that we will discuss here. We will also apply them to the different b-webs that we have described before.

6.2.1. b2boost

b2boost is one of few companies that uses Web Services in their business. They are a web-based solution aiming to facilitate trade between the vendors and retailers of the video games industry in Europe. b2boost uses Web Services when integrating the vendors and retailers system which simplifies the order process. Their pricing model is based on *commission*, where the vendors pay a fixed fee per order line to b2boost. They also charge the vendors and retailer for IT consultancy when providing help about usage of the platform.

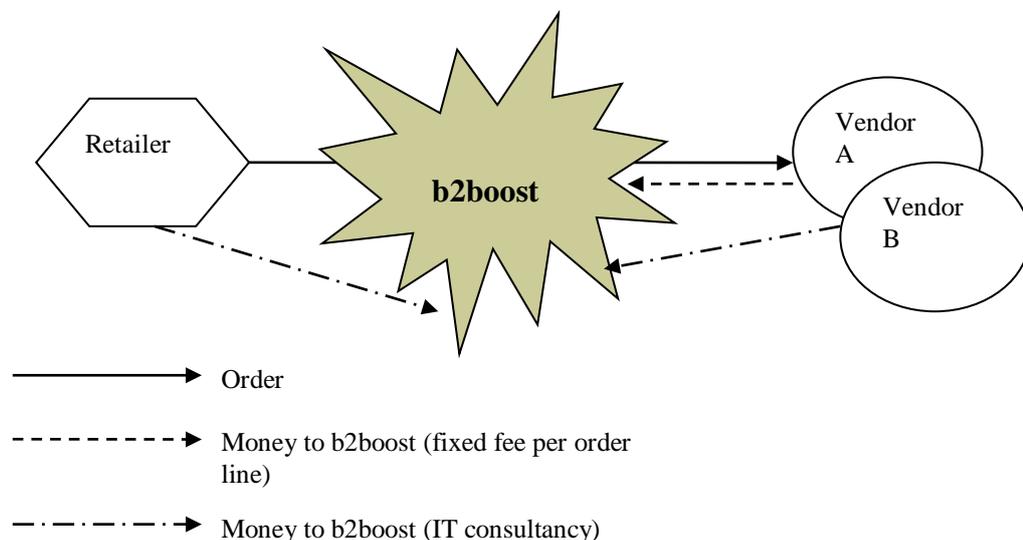


Figure 6-1 *b2boost's business model*

When looking at b2boost as a b-web we see them as an *Agora* since they are a natural third party who facilitates negotiation and transaction between the buyers and the sellers. They also have community as a central function, which is typical for an *Agora*. The participants share the same interest and they develop ongoing relationships. However,

¹³³ Afuah Allan et.al., *Internet business models and strategies*, 2001

b2boost also seems to act as an *aggregator* since they segment the market to the sellers and aggregate the sellers and buyers. The prices are also fixed and there is no negotiation or auction, which is often the case in the Agora. Nevertheless, b2boost does not take responsibility for ensuring fulfilment and they do not set prices as is typical for an Aggregator. So as a conclusion we can say that we think b2boost is an Agora, since they act as a third party and are not responsible for delivery etc, but they have some of an Aggregator's features.

6.2.2. OpenTable

OpenTable facilitates restaurant reservations over the Internet. They supports Web Services but are not using it at this stage. Web Services were used for a period of time with American Express. This allowed American Express to imbed OpenTable's functionality on their web site in a seamless manner, so the user did not have to leave the American Express web site to make a reservation.

OpenTable use a *commission model* where they collect a fix fee per reservation, but their main model is *subscription-based*. They charge the restaurants a one-time fee for installation and then monthly fees for use of the software and service for as long as they retain the system. If a reservation is originated from one of their partner, such as AOL and American Express, OpenTable pay that partner a revenue share amount, usually equal to 50% of the cover fees.

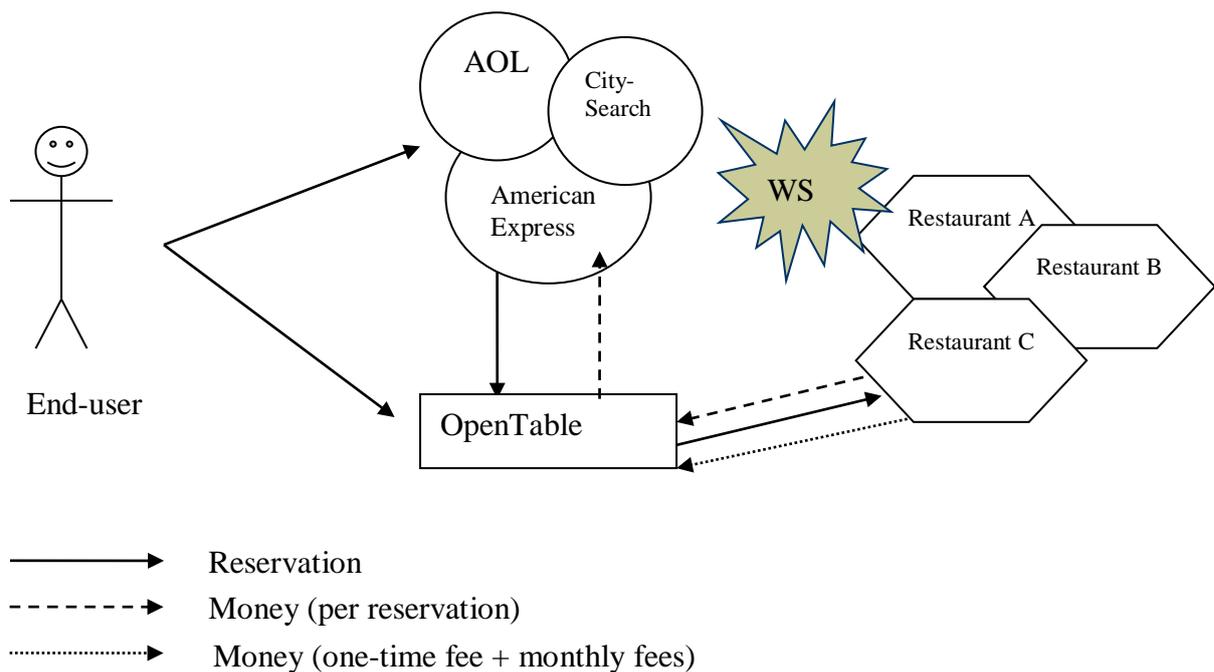


Figure 6-2 OpenTable's business model

Since OpenTable work as an intermediate between the restaurants and the user, we see them as an *aggregator*. They organises the services, set prices (0\$ for the end-user) and they are responsible for that the reservation has been made. These features are characteristics for an aggregator.

6.2.3. NTT DoCoMo's

There has been much talk about the Japanese wireless operator NTT DoCoMo's¹³⁴ business model. We have read about it in articles and many of the companies we have interviewed have mentioned it. It is a quite unique business model for Mobile Internet Service. DoCoMo is, as far as we know, not using Web Services but we think it is interesting to look at their business model, since they are strong evidence on that the roles in the telecom industry are changing and they have succeeded in the more competitive telecom market. They are not just acting as an operator since they have now developed a platform, I-mode. It offers access to thousands of Internet sites, as well as specialized services such as e-mail, online shopping, mobile banking, ticket reservations, and restaurant reviews to mobile phone users in Japan.

DoCoMo uses a *subscription-based* model for both the content providers and the end-user. They let the content providers attach themselves to DoCoMo's billing system for a small monthly fee that will be put on the end-users bill at the end of the month. The end-users pay a small monthly fee for connection but are also charged based on volume of data transmitted. DoCoMo also receives *commission* (9%) from the content provider for the billing system service. This easy to use billing system, when the customers benefit by receiving a single bill for all their mobile phone activity, resulted in that users are willing to pay for all kinds of content.

DoCoMo's business model is different from other operators since ordinary operators are used to only getting paid via connection. DoCoMo is the first mobile network to introduce packet switching technology. It enables the operator to charge for volume of data sent/received and not the connection time. It reduces the price of the service and avoids the user having to pay when the system is down. Another difference compared to ordinary operators' business model is the new source of income, which is the collection of commission from acting as intermediary in payments that the customer has to make to access certain contents.¹³⁵ This new source of income means that DoCoMo have taken their role as an operator one step further, they are not just acting as a payment gateway. They are taking their brokerage role to the next level, meaning they facilitate the service level agreement, and handle the billing and collection fee.

The model is a win-win relationship between the DoCoMo, content providers and the end-user. DoCoMo stimulate demand for I-mode by providing a wide range of quality services at a low entry cost for users and as result it increases traffic. The content providers gain exposure via the I-mode and avoid implementing costly billing systems.

When looking at DoCoMo as a b-web we think that in its early days, before the I-mode portal was developed, they acted as a *distributed network*. Before the I-mode portal they only provided infrastructure for the economy, since they enabled the communication. However, ever since they developed I-mode they act more as a mixture of distributed network and *aggregator*. They aggregate the content provider and customers and Docomo are among other things responsible for billing and the selection of services.

¹³⁴ www.nttdocomo.com

¹³⁵ Castejón Martín et.al, International Communication society (ITS), *Implication of the I-mode business model on the framework for European 3g mobile communication, 2001*

6.3. Will Web Services Change Business Models?

Both OpenTable and b2boost use a pricing model where their customers have to pay for every transaction being made. According to Steve Christensen at Babbleware this is not an appropriate model for Web Services. He promotes a model where the user is charged a fixed price such as annual licences. Christensen and other companies that we have interviewed compare Web Services' business model to the Application Service provider (ASP) model. The ASP model is about renting software applications and/or software-related services instead of buying it. The ASP owns and manages the software as well as the servers that run the software applications. The applications are then provided over secure Internet connections using standard web browsers such as Microsoft Explorer or Netscape Navigator. In return the ASP bills its customers on a per-user, per transaction or a fixed monthly fee basis.¹³⁶ Christensen thinks this model will fail when using Web Services and promotes instead a model where software is directly downloaded to the companies' server, inside their firewall at a fixed price, such as annual licences. He considers this to be the best method since he means that the companies are reluctant to pay on a per transaction basis and the user model is too difficult to quantify since the number of users should increase exponentially. He assumes that several large Web service aggregators will arise and that they will offer this downloaded, flat fee license per year. We can compare this to the use of modem and broadband when connecting to the Internet. Broadband is *subscription-based* and the users pay a fixed price each month while when connecting via modem users pay per minute, in other words *pay-per-use* model.

Murphy at Cape Clear on the other hand believes the first widespread commercial applications for Web Services could be the ASP model, where companies offer software online. He thinks Web Services is perfectly suited to these types of applications and that they now can offer it online in real-time. The company Xmethods agrees to this and means that the business models that are in use today are very similar to those employed by traditional web-based ASP's. Another person with the same opinion means that the software business models will not change much; they will still have a pricing model based on either license or subscription.

However these thoughts apply to the developer. What about using Web Services in the business? The majority of the interviewed people point out that Web Services will firstly be used as application integration and the new business models will follow once Web Services is more widely used. Another important point is that Web Services will not increase revenues as a first mission, it is more likely to decrease the costs. Xmethod indicates that companies that are already in business will use Web Services as revenue generators most effectively, if they can provide Web Services as new channel for their existing business. However XMethods also indicate that Web Services will be of most value when integrating activities such as supply chain information. An example on how Web Services will reduce cost can be seen in the company Encompys. Chief marketing officer, Lane, means that they reduce cost since Web Services enables multitenancy, which means that they are able to run multiple clients through a single version of the application. In other words, Encompys are able to link new clients into their network

¹³⁶ <http://www.howstuffworks.com/asp2.htm>

without developing expensive customer interfaces. This allows them to gain economies of scale.

We see that there are a lot of possibilities for Web Services, but the question is how to best benefit from it. On the question if business models will change, we think it depends on how Web Services are being used. If using it as an integrator with other companies an important issue is to develop partnership that enables this kind of integration. The new partnerships that arise and the use of the technology may increase the business opportunities and as a result there may be new ways to generate revenues and new business models may be developed. However, another side of the discussion is that Web Services is just a technology that will simplify the ways businesses are being conducted. It will not change a company's business model since the revenue source will be the same, they will use the same pricing model and the partners associated to the company will be the same. The only thing that will change is the reduction of cost when integrating different systems. An example of this is OpenTable who support Web services but are not using it at the moment. When they used it with American Express it did not change their business model, but it made it more convenient for the customers since they did not have to leave American Express web site when they made a booking. This example indicates that Web Services may be a technology that just simplifies the process. OpenTable is also said to have a Web Services' business model even before Web Services was even invented.¹³⁷ It shows that new technology may not be needed to enable a new kind of business models; the only thing needed is innovating ideas.

6.3.1. Business Model for Web Services

When asking the companies about business models many of them suggest a business model similar to the *aggregator* and the *agora*. For example, Bettag¹³⁸ at Reuters says that some organisations are planning to provide an e-hub, a complete platform. Such platform will provide the full environment to run transactional web services and use them through intermediaries. How these platforms will eventually work is currently still in discussion. For example, subscribers to the platform could have to pay a fee and get as many free transactions as possible. Another way could be to give those who subscribe to the platform a discount or share of the revenue. This will make it more attractive for organisations to join.

Hecking¹³⁹ at Robertson Stephen also considers this approach as useful and says that there is an emergence of Web Service Brokers, or as he terms it, "*trust networks*". They sit out on the Internet and act as an access point for multiple different companies. Once a company build a Web Service connection to one of these "trust networks" they can immediately be able to consume from one or more different providing organisations. Hecking thinks of it as the dating service for Web services. Christensen at Babbleware promotes this idea too and means that several large Web service aggregators will arise. The aggregators will compete in niche markets and will cooperate with other aggregators to increase the service offerings available to their subscribers.

This approach, concerning acting as a brokerage/aggregator, has been seen from a developer's point of view. However, this approach can be useful even for ordinary

¹³⁷ Sullivan Tom, *Special reports -Web Services*, InfoWorld, 2001

¹³⁸ Interview

¹³⁹ Interview

companies that are using Web services in their business, an example is b2boost. They use Web Services in order to integrate their customers and are acting as an agora with features of an aggregator's.

What is the best pricing model for Web Services? Well, it is hard to say, since it is different from case to case depending on what kind of Web Services are being offered and to whom. However based on what Christensen and Bettag pointed out fixed price subscription may be a good idea. This is also something that Vawss (Value added web service suppliers) agree to.¹⁴⁰ They suggest that in the B2B market subscription licensing will be the main model mostly due to potentially high usage volume. Large organisations find it more cost effective to pay a monthly fee for access instead of tracking usage across the company. However they assume that small organisations that use the services on a less frequent basis will probably like to pay-per-view. So it is important for companies to be able to provide both pricing models.

¹⁴⁰ Value added Web Services supplier (Vawss), *What charging mechanism should we use for Web Services?* 2002

7. ANALYSIS - THE TELECOM INDUSTRY

The discussion in the previous section has been about how Web Services will affect businesses in general. We will now discuss the paradigm shift that is now happening in the telecom industry. After that we will describe how the technology will affect the industry and suggest appropriate business models.

7.1. Value flow in the telecom industry

The value flow in the telecom industry starts with the infrastructure vendor, which provides infrastructure to the operator. The operator in turn gives value in form of network to the C&A providers. The terminal vendors have to comply with the standardised and agreed infrastructure interfaces. They provide the retailer with terminal devices, such as mobile phones. The retailer then sells these to the end-user. The operator gives the end-user value since the end-user can make phone calls with their mobile phones.

The end-user also gets value from portals and C&A providers in form of services, like ringtones, and content, like news. The services and content are most often provided through portals, which act as an aggregator.

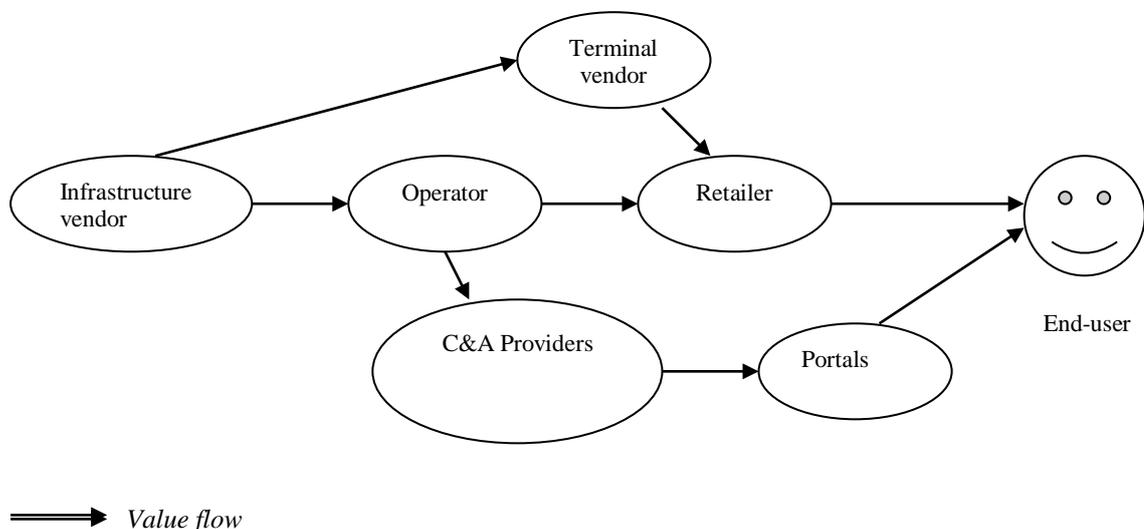


Figure 7-1 Value map: Value flow in the telecom industry

In this model we can distinguish three different businesses:

1. Terminal- End-user equipment: The retailer has the customer relationship but sells for operators' benefit.
2. Access: Here it is the operator who has the relationship to the end-user, since it enables the customers to get access to the network.

3. Providing content and services: The content and services providers provide the customers with extra services and content. This can be done either by their own portal or by an operator's portal.

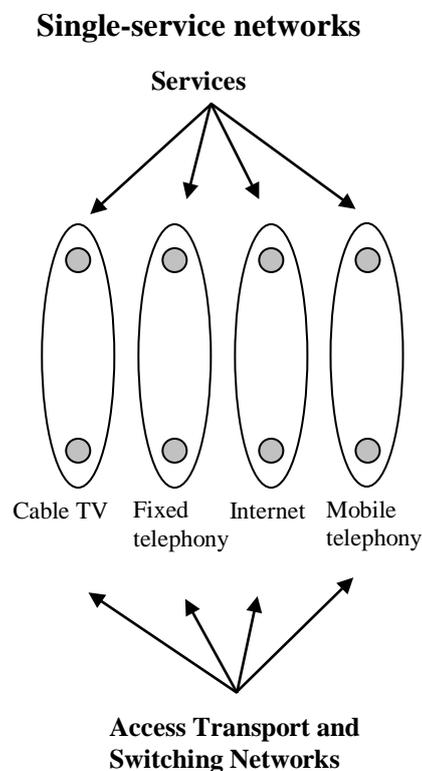
The business that we are interested in is a combination of number two and three. We want to see what Web services can do to develop these businesses. The reason why we do not look at the first business is because we do not think that Web Services will affect the business with the terminal and end-user equipment.

7.2. The Emergence of New Markets

As we have mentioned before the two industries, Mobile telephony and Internet, are now converging into Mobile Internet, and voice are converging with multimedia services. The convergence between the two industries is changing the telecom industry. This means that the vertical integrated networks will disappear for a horizontal approach, which is necessary to create a mobile Internet service industry. New entrants from the IT industry see the opportunities and enter the horizontal service layer. The operator and other actors are given opportunities regarding strategy and business models since there will be a strict distinction between the network and services. This means that the traditional mobile operators will not have as much control as before.¹⁴¹

7.2.1. The Convergence

The present telephone and data communications environment consists of a wide variety of networks, for example mobile telephony. Most of these networks are highly specialised and designed to serve a specific purpose.¹⁴²



¹⁴¹ Ericsson internal

¹⁴² Ibid

Figure 7-2 Vertical network structure¹⁴³

Each network consists of markets that one company alone can manage. They are all service providers, carriers and retailers. With this we mean that they control both access and services at the same time.

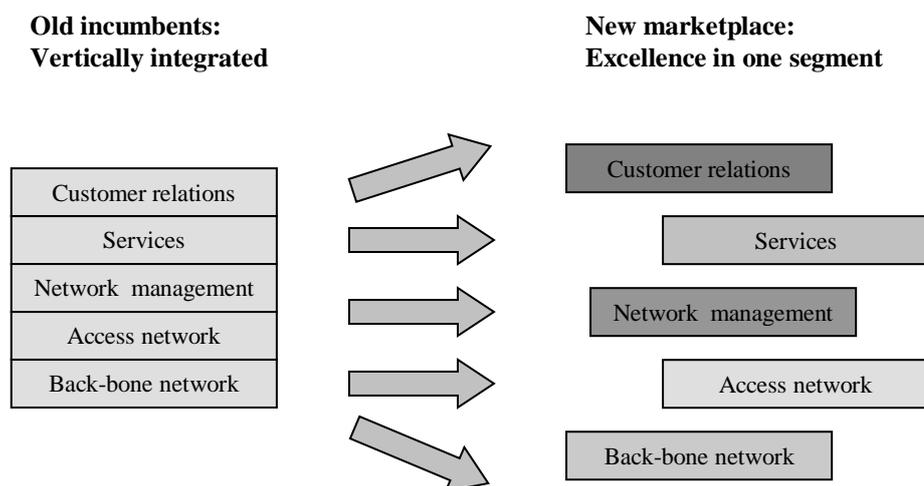


Figure 7-3 Industry moving from vertical integration to markets in horizontal layers¹⁴⁴

Now, when Internet and mobile telephony are converging the vertical integration has changed to horizontal layers and new markets are raised. In other words has the network been divided and every part has become an own market segment. New actors are seeing opportunities in these new markets and are entering. One new market is the service layer, which can be seen as the melting pot for the four industries, shown in figure 7-2. The business logic in the vertical integrated network distinguishes a lot from the horizontal. It is not a question about having control over the whole value chain, now they have to be aware of competing with new competitors and form new relationships. New business models must be developed since they are not like the traditional telecom business models.

It is not possible for a company alone to develop product packages that cover all markets in the service layer. This is because there are new companies entering the market and that has excellence in one market segment, meaning they be able to focus on their thing and as a result be able to develop more customized products. In order to succeed the companies must collaborate and focus on solutions that can add more value than anyone else. This means that there will be both collaboration and competition at the same time, co-opetition.¹⁴⁵

7.2.1.1. A New Technology – Web Services

The telecom industry is not going very well at the moment, which makes people uncertain to buy and try new technologies. In this downward trend Ericsson has failed

¹⁴³ Ericsson internal

¹⁴⁴ Ibid

¹⁴⁵ Ibid

too. However, there is a new technology emerging, Web Services that will simplify the open mobile Internet service industry. Mobile Internet industry is still in its early stage of development and Web services may spur the industry. When the industry starts to go better, Web Services will in a long-term perspective let the web be the service layer for any access technology.¹⁴⁶

Web Services can create new opportunities for the companies. It provides a simple and standard-based way for mobile portals to easily plug in or remove new services. This means that they can increase the value to their customers and the solutions will be more customer-oriented. The service and content providers that create the mobile Web Services benefit by being able to reach a larger customer base quickly and cost-effective. By having access to a larger set of valuable services the end-user will also benefit from this.¹⁴⁷

However, the Web Services may also just be a buzzword that may not fulfill the expectations. There is always a lot of talk when new technologies come out, but many of them fail to do what people are expecting of it. So, even though it has a lot of benefits as we described before, the companies may not adopt it or it might not work as well as predicted.

The players in the industry have to collaborate, especially the operators. If the collaboration works, new services and benefits will be exposed to the end-users, which may lead to increased consumption.

At the moment people do not see the need for new services since many services have failed and not been as useful as promised, for example WAP. Right now there are not enough good and useful services that attract the customers. It is now important to come up with new necessary services and good incentive to the telecom industry's customers in order to be successful again. It is important that the services are customer-driven and not product-driven.

One step in the direction towards developing the mobile industry was made in June 2002 when 200 of the world's leading operators, device and network suppliers, information technology providers and content providers announced a new global organisation called Open Mobile Alliance (OMA).

The Open Mobile Alliance (OMA) delivers open standards for the mobile industry and helps creating interoperable services, which work across countries, operators and mobile terminals and are driven by users' needs. This may accelerate the development and adoption of new, improved mobile services and applications. It is essential to collaborate since an individual technology, product, vendor or operator will have little success without engaging all aspects of the mobile value chain; devices, networks, applications, and content. Without partners a company can stand alone with an excellent idea, for example a new service, but they will have a hard time to reach the customers with just one service. The customers will instead choose a package where they get more out of it. So if everyone else collaborates in order to give the customer the right mix of device, network and service it will be hard for a single company or technology to reach the customers with their idea.

¹⁴⁶ Ericsson internal

¹⁴⁷ Hewlett-Packard (hp) White paper, *hp Web Services platform (business level)*, 2001

7.2.1.2. Technical development environment

In order to take advantage of Web Services the developers have to learn how to use it. There are several technical development environments on the market that provides tools and services for the technology. These environments will enable the development of new services, and as more services are being made, they will also get improved and better suited to the customers.

One of the environments is Microsoft platform .NET, which is built on open standards and embraces all programming languages. The platform includes services, servers, development tools and systems.

A competitor to Microsoft, Sun, has also a development platform, which is called Sun Open Net Environment (Sun ONE). It is standard based and delivers directory, portal, integration, communication, and application servers.

In the new industry, mobile Internet, such technical development environment can also be found. Ericsson Mobility World is a global initiative that brings together developers, operators, content providers, enterprises and technology suppliers in order to promote innovation and partnership in the Mobile Internet. These new collaborations are new to the telecom industry, but necessary since it will lead to a faster development and launch of new Mobile Internet services. The environment has a section called developers zone where software development tools and product information are easily accessible to the developers. The end-user will also benefit since there will be an increased supply of entertaining and useful services.

7.2.1.3. The Service Layer

Our investigation will be focused on the service layer, which consists of mobile application service providers and content providers. These providers are growing in quantity each day. In the service layer a company's activities can be divided into two principle categories:

- *Consumer* services/products, for example games, messaging, content etc.
- *Corporate* services/products, for example e-mail, access to corporate information etc

Our investigation will be delimited to the consumer category. We have chosen to look at this category since we have the most knowledge here. The customer category contains, within the Mobile Internet industry , several different segments of companies. These are also representing new markets in the service layer:

- *Entertainment*: Games, jokes, etc.
- *Financial*: Stock trading, financial information.
- *Information*: News, content.
- *Messaging*: SMS, e-mail, IM.
- *Mobile marketing*: manage opt-in marketing or provide technology.
- *Multimedia*: Multimedia clips.
- *Platform*: Content or messaging management solutions.

A company in one market can often be presented in more than one category, but the companies are becoming more focused on their core competences. However, it is becoming more common for companies that provide consumer services to focus on this and not provide corporate services. The entertainment category, followed closely by the provision of a platform is the one that most of the leading companies are focused on. In the entertainment category gaming represents a great deal of the activity.¹⁴⁸

7.2.2. Strategy for C&A Providers

The new services that are being introduced and enabled by the mobile Internet will change the telecom industry since it will mean that content & application providers will include mobile devices as part of their business and not as a separate communication channel. It will be irrelevant for them if the users are mobile or not.

Mobile Metrix has identified four strategic positions for mobile application and content providers based on their brand and knowledge of end-users. These are shown in the figure below.

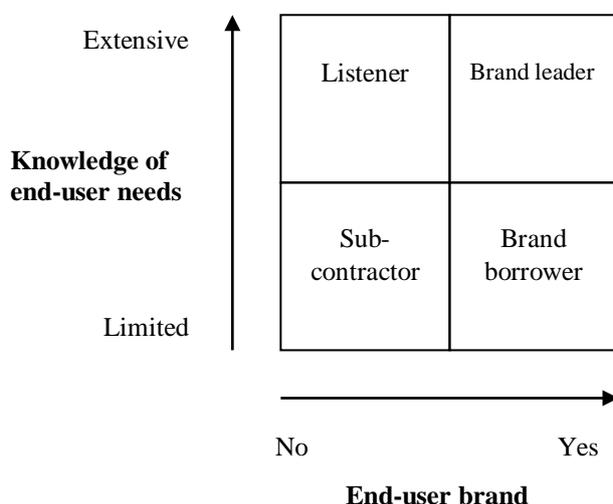


Figure 7-4 Application and content providers' strategic positions¹⁴⁹

A company using the *listener* strategy owns the particular product rights and has developed it based on their knowledge of the market needs. They develop and/or aggregate services which are provided to an outlet, typically the operator, who sells to their customers. Important issues are to find out consumer needs and design services in a way that attracts the consumers. Many of the companies in this category are also presented in the brand-borrower strategy.

Disney is an example of a company that has a *brand leader* strategy and is currently providing content to several operators around the world. This enables them to get into the wireless channel. Operators benefit from this development since it gives them services

¹⁴⁸ Mobile Metrix, *The Saviour of 3G (2nd edition) – the Leading Mobile Application and Content Providers*, 2002

¹⁴⁹ *ibid.*

that are likely to improve their profile and also increase mobile Internet services. The brand is vital to these brand leaders and maintaining the brand value is a critical success factor. They are not providing their services for free since it would weaken their brand value.

When an application provider does not bother about the consumers needs, they will become more like *subcontractors* than application providers. The portal/operator will define a service, and the application provider will be dependent on the operator's specification in order to develop the service. The key issue here is the ability to define a service and own the rights to that design.

It has shown that more and more providers have taken the direction or tried to employ a *brand borrower* strategy. It is one of the most popular approaches for those who want to be a mobile application provider, since it has been found that services that carry a brand name have been more popular and successful. An example of a company using the brand borrower strategy is Digital Bridges, which will be described in next part.

In order to maintain the strategic position the application provider need to have knowledge and a link to the consumer. Mobile marketing has grown in credibility but has become more specialised with a few key players standing out per market.

The basic principle is that the objective of a portal is not just to aggregate services but to assist their customers to find services that will be of value to them.

7.2.2.1. Digital Bridges

One company that has entered the service layer is Digital Bridges, which is focused on providing entertainment services. They have already agreements with 40 operators and portals, which mean that they can reach over 245 million customers. However they are not very profitable yet. The main problem is the low usage of services and that operators have not been very successful at presenting a package of services, which has attract the consumers. Digital Bridges has also agreements with brands that can be used with mobile services. An example is the company's mobile rights for Star Trek. In order to gain most advantage of these brands and the contracts with operators Digital Bridges will now market the services through various retailer packages. This strategy makes all stakeholders in a position to benefit and win. *Consumers* get access to mobile services and are able to find services and pay for them in a way that they are familiar with. *Operators* will gain advantage since many consumers will start to use services and the operator will gain added traffic revenue and service revenue share. Further, once consumers see the user-friendly packages they will begin to use other services. This will give operators benefit, for example increase traffic. *Brands* have a new channel to provide services in co-operation with Digital Bridges towards consumers. Since the consumer will be paying for the services the brand will get more value. *Retailers* will have a new exiting product to distribute and sell. The products can then prove to be a major growth area over the coming years, like video games and music CDs. *Digital Bridges* will be able to take more control over its business and finally they can take control over consumer awareness and usage. This has been a problem for many service providers in the past since it has been unwise to rely on the operators or portals to encourage consumer usage of mobile services.

However, there are also risks with the move Digital Bridges has done. The first is the financial risk. It is obvious that there are costs with providing services and if the usage of services will not improve dramatically and the customer willingness to pay for these services will not be there it will be an expensive strategy for Digital Bridges. The other major risk is a conflict with the operators since they may wish to be the main source and distributor for the provision of mobile Internet services to customers. Some operators may see the move by Digital Bridges as a threat but other will see the advantages and that they can gain from the acceleration of mobile Internet usage.¹⁵⁰

7.2.3. The operators' new roles

The main income for the operators has mainly been from access and primarily voice access. It is still expected to be their largest source of revenue. However as the changes in telecom industry, described in previous sections, occur it will open up new possibilities for the operator. We will here describe the relationship to four potential customers; the end-user, the content and application (C&A) providers, companies and other operators.

- *Companies:* The operator acts as a sales channel/enabler provider to the companies and offers them mobile IT solutions and hosting services.
- *Other operators:* The operator finds other operators as new customers. The operator offers capacity, connectivity, capabilities and hosting services.
- *The C&A providers and the end user:* This is the relationship that our investigation is focused on. The C&A business is a new opportunity for the operator. The traditional voice business model is no longer appropriate, which is evident when looking at communication, content, pricing and relationship to the customer. *Communication* is two-way in the voice business and one way in C&A business. In the voice business *content* arises instantly and it is *priced* per time unit, whereas in the C&A business the content is pre-packed and market-priced. The operator controls the *customer base* in the voice business, but in the C&A business it is the C&A provider that attracts and creates a customer base.

7.2.3.1. The Relationship between C&A Providers, End-User and Operator

So, what is an appropriate model in the C&A business? There are three main models between the operator, end-user and the C&A provider.¹⁵¹

¹⁵⁰ Mobile Metrix, The Saviour of 3G (2nd edition) – the Leading Mobile Application and Content Providers, 2002

¹⁵¹ Ericsson Internal

- *Bit-pipe provider*

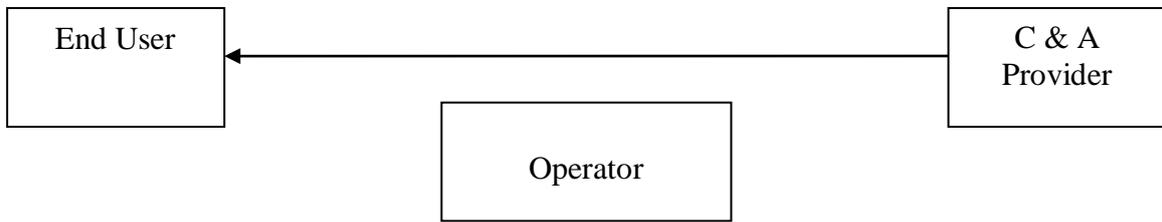


Figure 7-5 *Bite-pipe provider model*¹⁵²

The operator’s role here is just to provide network access but it may also be to provide a payment service to the end user. In other words, the business relationship between the End-user and the C&A provider is independent of the operator except for the payment service. The operator is essentially a “bit-pipe” and this is a role that the operator is trying to avoid.

- *End-user service provider*

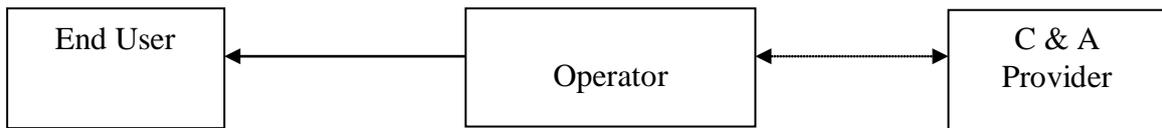


Figure 7-6 *End-user service provider model*¹⁵³

The business relationship is between the operator and the end-user and can be seen as an extended “voice-business model” where the operator is in control. The operator act as service provider and offers content and services supplied by C&A providers or the offerings may be based on capabilities and support functions provided by the operator to the C&A providers. The main problem for the operator is that this is outside the operators’ experience and skills since they are not used to promote entertainment, information and games.

- *Channel provider*

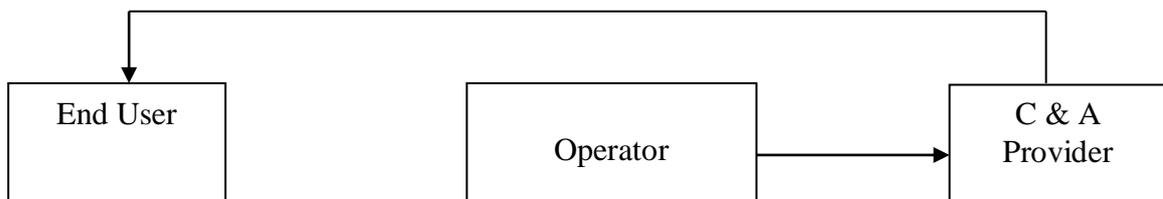


Figure 7-7 *Channel provider model*¹⁵⁴

¹⁵² Ericsson internal

¹⁵³ Ibid.

This is more in line with the operator's traditional business, since it acts as a channel. The operator's customers in this model are the C&A providers. The operator offers them a new channel for promotion, sales and distribution. Other offerings include transport, payment services, security mechanism, digital presentation, and production and delivery mechanism. The offerings are based on capabilities, service and support functionality. However, the main business relationship is between the C&A provider and the end-user.

7.2.4. Strategy for the operator

The operators may have to sacrifice their traditional position. They have the dominant role in the industry and are, as Westerling¹⁵⁵ at CRV mentions, afraid to lose the billing relationship to the customers. PJ¹⁵⁶ at Cape Clear also mentions this and says that it is not clear that the operators will be able to get a share of the revenue because there is nothing to stop the end-user from invoking third-party Web Services. Further, PJ means that content providers will be able to easier expose their services and information since there are tools available to this. Nevertheless, the operators have potential to increase their revenue streams since the development of more services can also increase the usage of their network.

In order to avoid the bit-pipe role the operator should take advantage of the development of content and application. One way for the operator to succeed is to act as a retailer. This means that they should aggregate many services from many suppliers and make sure that the services meet the needs of the customers. It is important to understand that they exist for the benefit of the customers. The services should be packaged so that they give value to the customers. If the customers just get a list of services it may only confuse them. To further develop this idea the operator can let the customer not just choose pre-determine packages but let them pick whatever services they wish for a fixed price. This will encourage customer to try new services. It is essential that the customers get assistance and guidelines during the finding of services. This way of offering services gives the customers more power and the services get more customized.

This strategy would also mean reduced business risk, since the operator is no longer responsible for everything. The content and application providers have to make sure that their services sell in order to survive. This means that they will market their services and it is no longer just the operator who has the relationship to the customer and is responsible for generating revenue.

7.2.5. Business Models in the Telecom Industry using Web Services

What is an appropriate business model in the telecom industry? As we have discussed in our previous section a valuable business model involving Web Services is to act as an aggregator/agora. This approach is suitable in the telecom industry as well. Bringing together different players will enable the players to reach a wider market and it will simplify the consumer process for the end-user. The DoCoMo model is an example of

¹⁵⁴ Ericsson internal

¹⁵⁵ Interview

¹⁵⁶ Interview

such approach in the telecom industry. However, as Cape clear mentions in their report¹⁵⁷ concerning mobile web services, DoCoMo could increase their services if they adopted Web Services. Most of the services supplied on I-mode are simple content such as games and travel information. These simple content deliveries could with Web Services be interactive services, since Web Services enables third-party organisations to expose their internal systems. This means that instead of just viewing content such as listing of movies, the user can with the interactive services select and buy tickets on their way to the cinema.

Christensen also has thoughts concerning such aggregator and the relationship between the operator and the content/service providers. He suggests that for a flat monthly fee, users of a mobile operator's network can utilise a service, which will be a part of a package of content. Then the content/service provider will make a percentage of this flat fee and the mobile operator will increase their customer service, package differentiation and bandwidth consumption. This approach is similar to DoCoMo but the difference is, according to us, that the operator does not own the platform, as is the case in DoCoMo's model.

In the Swedish market there has also been discussions concerning the relationship between the content/service providers and the operators. The providers and the operators have a interdependent relationship, since without the new attractive mobile services the operators will not be able to attract the customers to mobile internet. The providers are also dependent on the operators since they need the operators in order to be able to charge the customers via the operators phone bills.¹⁵⁸ Telia has, as the first Swedish mobile operator, agreed to a sharing system between the providers and the operator where the provider only has to give Telia 20% of the revenues from the services. This fee used to be around 40%.¹⁵⁹ However, when comparing this to DoCoMo it still seems high since DoCoMo only makes the providers pay 9% of the revenues. The operator Vodafone has recently come up with another approach for billing. They use credit card payments, meaning the end-users register themselves once at Vodafone and are after that able to buy things via the mobile phone and a pin-code at all the content/services providers that Vodafone has an agreement with.¹⁶⁰ This is called Single Sign On (SSO) where the user only register once and then can do several transactions without any new login.

These examples show that it is important for the players in the telecom industry to find a way to collaborate. All players want to see how to make money of the new technology and of mobile Internet and no one wants to be left behind.

¹⁵⁷ Cape Clear Software and Softwired, *Mobile Web Services*, 2002

¹⁵⁸ Computer Sweden, *Utan betalsystem tappar Sverige mobilt försprång*, 2001

¹⁵⁹ Computer Sweden, *Nu blir det snurr på mobilt internet*, 2001

¹⁶⁰ Computer Sweden, *Vodafone planerar mobilt betalsystem*, 2002

8. CONCLUSION

With the theory section, the analysis and the problem in our mind we have come up with a conclusion. We will first give some key points that describe the main issues that have risen in our investigation. The three main areas will after that be shown and summarised.

8.1. Key points

- Web Services are in its early stage but is thought to have (or can have) the possibility to spur the mobile industry.
- New markets (for instance Web Services) and new entrants (because of Web Services) in the mobile Internet are forcing the actors to decide how to position themselves.
- Collaboration and niche markets is important in order to succeed
- Services need to be customer driven and packaged
- It is hard to distinguish specific business models since there are potentially infinite varieties, but they can be categorised on logical basis.

8.1.1. Web Services

Web Services are in its early stage and many companies have not yet adopted the technology commercially. Most companies that have adopted it have done it within the company and may soon try to connect their systems with their partners, suppliers and/or customers. There is however some companies that already have done this, but they are very few.

People had a lot of expectations when EDI was introduced, and now they have the same expectations. There is one difference, Web Services has gone one step further in technology development and is therefore more developed and better than EDI solutions. Web Services will reduce the costs to them who are using the technology internal. However, there may be a lot companies that already have done investments in large systems and want to see return on the investment before starting using Web Services. If the companies standardise their integration with Web Services they will reduce costs. This will protect investment and avoid technology lock-in. Web services also enable companies to create better collaborations and relationships. The money to earn comes when the company are using Web Services commercial. Then better and more customer-driven services can emerge, both in the mobile industry and in the non-mobile industry. The XML Web Services technology brings new thoughts to the Mobile Service Industry. It brings the possibility to distribute development, applications, content, capability and support, service hosting etc. However, the adoption of commercial Web Services will take long for all involved companies.

8.1.2. Mobile Internet

The telecom industry has been under major changes since the convergence with the Internet, and one consequence is the mobile Internet. There has been a paradigm shift where the industry that used to be vertical integrated, has now changed to horizontal layer. This has lead to that new markets have emerged and there are new entrants on the

markets. Companies need now to specialise themselves and decide how to position themselves on the markets. For example the operator and Ericsson have not quite understood what is happening and are not certain on what the right strategic approach would be.

Both mobile Internet and Web services are today in their early stages so it is hard to predict what will happen to them. Every day there are new things emerging and the market is changing rapidly. We have during our investigation witness how fast everything is shifting. There are now several markets emerging and the question is how to handle them. One example of this is the foundation of OMA in June, which proves that companies are afraid of being left behind and have to act fast. They are not quite sure how to handle the development of mobile Internet on their own and that there is a need for collaboration that will spur the industry.

8.1.3. Business models

It is hard to predict what a successful business model look would like, since there is need for a deeper exploration of every single actor in the industry. It is also hard to know what will happen in the industry since it is changing so rapidly. However we see collaboration, as in a b-web, as the key. We have seen evidence of this both from the theory section, the answers from the companies and from the help we got from Ericsson. No one can be successful if they try to handle everything alone. The content and application providers and the operators will both benefit if they collaborate and in that way try to reach the customers. The Walled Garden, where the customer has no choice but to buy services at a specific operator, has to be torn down.

The most important thing to remember is to make sure that the services should be customer-driven and not technology driven, since otherwise will the growth of mobile internet services never occur. The services should be customised and packaged, where the customers are able to choose by themselves what services they wish to have in their package. This is possible to arrange since with Web Services it is easy for mobile portals to easily plug in or remove new services. This means that they have the opportunity to increase the value to their customers and the solutions will be more customer-oriented. The providers need to assist the customers when they choose services, by for example offer guidelines or suggest packages that match the customer's interest. The charging for the services should be subscription based, where the customer pay for unlimited use over a period of time.

The question is who should offer the services, is it the operator, the C&A provider or someone else? We see a scenario where new roles arise, like brokers or portals that provide the services via operators and C&A providers. The operators' role as the main actor in the telecom industry will diminish and new actors will be given new opportunities. The key is for the actors to position themselves and decide what to go for. In order to cross the chasm it is important to focus on a single target segment of customers and get a niche-based adoption, this will take them to the mainstream market.

8.2. Further Research

As a part of our conclusion we see a need for further research. Since Web Services is such a new technology and since the paradigm shift in the industry brings out new possibilities, we think that deeper investigations are needed.

First of all we suggest that a study should be done on the different operators and C&A providers in order to see how they position themselves in the market, if they use the Web Service technology in their strategies and how they think it will add value to the industry. This is important since it will give an understanding on where the industry is going and how it may look in the future.

Another issue that we think is important is to study and analyse the new markets that have emerged and the new entrants on these markets. This is important in order to see which new entrants that can be expected as potential competitors in the future but also how new entrants can change the market's direction. The new markets also need to be analysed in order to see where the money and customers are.

Another aspect is the fact that Web Services may just be a technology buzzword that may not be as successful as expected. It would be interesting to see what happens to Web Services if it will be adopted in a way that is predicted. It will also be interesting to see if there will be any business changes because of Web Services, or if it is just a change in technology. It also raises a question whether Web Services is the main contribution that will flourish Mobile Internet or if Mobile Internet can manage without it. What exactly will Web Services do for the Mobile Internet or for the whole Telecom industry? What is the real new market for Web Services? Is it in the Telecom industry or is it in another industry or market? It would also be interesting to see how Mobile Internet develops. In other words, doing the research more in-depth and not as an overview as we have done would be more desirable.

Since we have done the investigation pretty early in the adoption of Web services it has been very hard to see real example of what Web Services can contribute. This is because there are only a few companies using it. Therefore another question rises: How do we add value between partners with Web Services? We also think it would be interesting to see if the companies' culture may change when they adopt Web Services since it may lead to new ways of working and new routines.

As a conclusion we can say that there is a need for more investigations about Web Services and Mobile Internet. Everything changes really fast so the companies need to be prepare to make changes and they have to look out for new entrants and new markets.

9. SELF-CRITICISM

During our work we have realized that a lot of things could have been done in a different way. However the main contributor to our mistakes is the fact that we were not familiar with the area when we started. We did not have much knowledge about the Telecom industry or Web Services, which meant that we first of all had to figure out what it was all about. It was also hard for us to see the problem in the beginning, we did not really know what exactly to focus on which led to that we started to write about things that were not relevant. This however gave us a better insight in the area and it increased our knowledge and led us eventually to the problem. The problem is still very big and it would have been easier if we would have limited our thesis to just look at the operators' role and see how they could benefit.

As we mentioned in the Method section we see some drawbacks with how we collected the empirical material. It can be quite hard to interpret answers via e-mail, since people answering are perhaps only writing the answers quickly without really putting much effort in it. One mistake we did was that we in the beginning did not fully defined what we meant by Web Services, and the questions might have been hard to understand. They were to general and would have been more suitable when interviewing people face-to-face, since it then would have been possible to explain the questions further and also ask the companies further questions. However this was something we realized during the time, so we changed the questions to the companies we send out to later. Another drawback with questions via e-mail is that it might take long time until they answer or they might not even answer at all. It is also hard to send it to the right receiver.

Another thing we could have done different is that we could have been more independent in our thoughts. Since we were really uncertain about the area we did not trust ourselves and did not develop our thoughts further.

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