



# Business Modelling for ICT based services targeted to Intellectually Disabled People



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2012 Leppävaara

**Laurea University of Applied Sciences**  
Leppävaara

**Business Modelling for ICT based services targeted to  
Intellectually Disabled People**

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Degree programme in Service  
Innovation and Design  
Master's thesis  
November, 2012

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Year	2012	Pages	103
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Services are becoming a key focus in the current era. Organizations globally are facing rapid changes in providing services. Despite this alarming growth, the advancement in Information and Communications Technology (ICT) has created so many opportunities but considerable challenges for the service industry.

Information and Communication Technologies (ICT) have become part of everyday life in recent years. ICT can provide dignity and well-being to people through self-facilitation. ICT like the Internet, really helps the intellectually disabled people to enrich their life. Intellectually Disabled People can take advantage of ICT as a force for social inclusion.

The case company is a small and medium sized organization. This thesis is part of an international project called DiY-SE (Do-It-Yourself Smart Experience). The study is done for the service symbol-based chatting client. Two stakeholders, University of Tampere and Laurea University of Applied Sciences, participated in this study. Presently, the case company needs a business model for its operations and this study solves this business problem.

The main objective of this study is to design a business model for the case company so that other similar sized organization that offers ICT based services can also follow the steps undertaken. This objective is fulfilled by completing certain actions which are given in subsequent sentences. Firstly, understand the business model concept by reviewing the existing literature and formulate a few maps of questions. Secondly, apply it to the case company by means of workshop and open-ended interviews. Thirdly, find some improvement areas by collecting feedback from potential customers by means of open-ended interview. Henceforth, this dissertation aims to shed light on how to develop a business model for the case company.

The theoretical framework of this study collects service definitions and picks one that is more apt to ICT-based services. Then it gives a picture of pure service businesses and lists out the four main characteristics of services. Followed to this, services that take place through electronic means are explained which follows a definition of the term intellectual disability and the importance of ICT in the life of intellectually disabled people. Finally the concept of business models is detailed emphasizing business model canvas.

The empirical study is made based on questionnaires, workshops, open-ended interviews and online discussions. The guideline questionnaires were sent to the participants before the workshop and the workshop is conducted with one of the stakeholder, Laurea University of Applied Sciences. Two representatives from Laurea participated in the workshops. In order to get data to fill the business model canvas open-ended interview was conducted with stakeholders. The responses are then analyzed based on the business model canvas by means of content analysis method and then sketched the canvas. After the canvas was filled up it was then shared with stakeholders for validation and refined further, based on some online discussions, until stakeholders were satisfied with the model.

Once the business model was created it was then used to collect feedback from customers. Potential customers are intellectually disabled people in Finland and people who are linguistically impaired in India. As the case company had already collected feedback from Finnish people this study concentrates mainly to collect feedback from Indians.

This feedback collection was undertaken by means of open-ended interviews with a few people randomly selected from three different Indian states. The collected responses were then undergone content analysis to figure out some improvement areas. These suggestions for improvement are identified so that the application's market in India rises which increases the case company's profit. The suggestions identified are (1) visually simple and culturally accepted symbol design, (2) educate the masses to tackle technology illiteracy issue, (3) provide assistance through local training organizations, (4) to overcome the problem of less signal sensitivity come up with an application that works offline also, (5) minimize the subscription or usage costs and (6) include government procurement channels also to distribution channel. Finally, the improved business model canvas is presented to the case company.

The study has shown that the business model canvas is a useful management tool to formulate the business model in a uniform manner. The result of the thesis is a comprehensive business model that can be implemented in real life use. As said earlier, the business model generation can be used by other similar sized (small & medium) companies as well and hence the generalization possibility of the study is high. Additionally, the business model is composed based on a broad literature review and the final model is checked by the stakeholders. This makes sure that the validity and reliability constraints of the study are adhered well.

Keywords: Service(s), Service Business, ICT-based Service, Business Model Canvas, Intellectual Disability, Intellectually disabled people

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## 1 Introduction

The service sector was largely neglected until the early 1990s (Pires, Sarkar & Carvalho 2008), but attention has grown significantly during the past decades (Lee, Olson, Lee, Hwang & Shin 2008). The number of employees in the service sector indicates that the service sector has become a more dominant force in national economies. It is without a doubt that services dominate the economies of the world's most advanced nations as well as other fast-growing and developing nations.

Service firms are typically considered to be companies whose core product is a service. Some service firms can be considered pure services, such as transportation, lodging, financial services, and health care (Zeithaml, Bitner & Gremler 2009). Service firms increasingly adopt IT-based services in order to improve their service quality, customer satisfaction, and financial performance (Karimi, Somers & Gupta 2001; Palmer 2008). Moreover, IT-based services enable service firms to offer new ways to deliver services, which are more accessible, convenient, and productive (Wilson, Zeithaml, Bitner & Gremler 2008, 12). This study focuses more on this IT-based service namely Information and Communication Technology (ICT) based services.

This dissertation details the work carried out for the master's thesis which designs a business model for Information and Communication Technology (ICT) based services. The purpose for generating a business model is to improve customer experience, and thus increase the turnover for the case company by using ICT based services.

In this fast growing competitive world, it is so complex to make business decisions. Business model is one of the concepts or tools that aid business managers to make strategic decisions in this difficult environment. It is needed for the business managers to understand what their business model is and what essential elements it consists of, which enable the managers to assess, measure, communicate and change their business model in order to stay competitive in the tough business environment. (Osterwalder 2004)

Business model concept has become popular because of the dawn of ICT and globalization. ICT technologies create an opportunity for new service offerings (Meuter 2000). Tele - communication, for instance, offers cheap international calls through internet. Online shopping allows a customer to purchase a product from any part of the world. Inventions in the ICT sector has led to a service revolution (Vargo 2004, 4) and these inventions create the opportunity for new services in the health care industry as well, where the case company is competing.

A company has to be always focussed on its customers to make them happy and thereby keeping them loyal by providing innovative services - especially in an environment where the pace is permanently increasing. The case company concentrates in providing ICT based services for intellectually disabled people. Since the case company has already gained major market share and expanded its operations in its key customer segments, it has now considered essential to improve the customer experience, in order to maintain and raise its revenue. The challenge, that the company is facing now, is to develop a business model and continue to adequately satisfy customers, thus being able to sustain and lift company's returns.

### 1.1 Study question and objectives

The case company plays the central role in this study. The development of its business model and the future improvement opportunities of its business model are the main focus areas of this study. However, the study is not limited to the case company only, the targets are also to provide general application to other Small and Medium Scale Enterprises (SMEs) to develop their business models, and to provide guidelines on how to develop business model.

The business problem in this study, therefore, is designing a business model for the case company in order to improve the customer experience and thereby to maintain and raise the company's revenue. The problem itself leads to a more specified **question for study** which can be formulated as follows:

*How to design a business model for a small & medium sized organization that offers ICT based services?*

The steps pursued in order to answer the study question can be categorized into three stages. Firstly, understand business model concept and find out what are the key issues that need to be considered while business modelling in order to succeed as a service provider in the industry. Secondly, the issues that are found to be important have to be addressed by the example of the case company. Thirdly, suggest improvement areas to the case company concerning its business model in order to improve the case company's profit and customer value.

Eight sub-questions have been compiled to design a business model for the case company. They are listed in Table 1 with the corresponding actions.



Table 1: The eight study sub-questions and their actions fulfilled that are addressed in this thesis to answer the main study question.

Sub-question for	Sub-question	Action
Theoretical section	What are service, service business and main characteristics of services?	To understand business model concept.
	How do you characterize ICT based services?	
	How can ICT based services offer Intellectually Disabled People an increased degree of independence in their everyday life?	
	What are the communication barriers existing in India?	
	What are business models in service and what kinds of different models exist in the literature?	
	What is a business model canvas?	To identify what are the key issues that need to be considered while business modelling.
Empirical section	How to design a business model for the case company?	To address the issues identified by applying it to the case company.
	How to find out improvement areas for the service?	To suggest improvement areas for the betterment of the company's business in India.

Out of the eight sub-questions first six are answered by reviewing existing literature and other internet sources. Remaining two is addressed by applying the gathered knowledge from the first six questions as well as by applying qualitative methods such as questionnaire, open-ended interviews, workshops and content analysis. By answering these eight questions one will be able to design the business model as pointed out in the main study question.

## 1.2 Scope, benefit and significance of the study

In this study first, literature on service business, ICT based services, intellectual disability and ICT for intellectually disabled people, business model frameworks are reviewed. A business model is generated on the basis of existing knowledge on business models and findings from

the brainstorming sessions with the case company. Note that the purpose of this thesis is not to innovate a new business model, but to derive a business model that realizes the case company's strategy. The scope is limited by the amount of the relevant literature found by the researcher and by the number of brainstorming sessions conducted.

The issues that are discussed in the study will be applicable to small and medium sized companies operating in various fields of business. Henceforth, the resulting model covers all fields of operations for a small and medium sized company. Following the map of questions should be applicable to any similar size company. In this respect, the study benefits other similar sized companies operating in various fields of business.

The business model, which is the result of this study, assists in the design of the case company's business plan. At the core of every business plan must be a business model to describe and illustrate the way an organization creates value and makes money. By designing and working through a business model, the case organization will understand all the components of the business better and the business model can be used as a great platform from where to write the business plan.

### 1.3 DiY-SE project summary and service design process

The Do-It-Yourself Smart Experience (DiY-SE) project will enable people to direct their everyday environment into a highly personalized meaningful communication/interaction experience that can span the home and city domains. The project aims to create a sustainable marketplace for user-generated application (components) in which non-technically skilled people can participate. (STARLab Website) The proposed Do-it-Yourself approach, in which nonprofessional users get the tools and the support to create and share their own smart events, is supported and motivated by visions on an Open Society (Karl Popper) in which citizens are empowered to form and share their own view of reality. The project aims to contribute substantially to the open Internet-of-Things (IoT) world and the transition to Web 3.0. (ITEA2 Magazine 2010) In short, this project aims at enabling non-technically-skilled people to easily create, setup and control applications in their smart living environments as well as in the public Internet-of-Things space, allowing them to leverage aware services and smart objects for obtaining highly personalised, social, interactive, flowing experiences at home and in the city (DYSE Website).

The project's goal is to support Users in Creating Aware, Interactive & Flowing Experiences in an Internet-Of-Things World. The project transforms everyday people into city producers (as opposed to city consumers) by empowering them to easily create, assemble, share, control and execute their Smart Space applications in their homes and in the city. For this, these

users will be able to (re-) use and (re-) combine devices, sensors, actuators, services and application fragments that they own themselves or that are shared by others. As such, people will be able to direct their everyday environment into a highly personalized meaningful experience that can span the home and city domains. The project aims to create a sustainable marketplace for user-generated application (components) in which non-technically-skilled people can participate. (STARLab Website 1) DiYSE architecture is presented as Figure 1. This involves covering the whole ecosystem - from installing and identifying a sensor up to how the user can express certain behaviour or a specific service experience using those sensors in a particular environment (ITEA 2 Magazine 2010, 16).

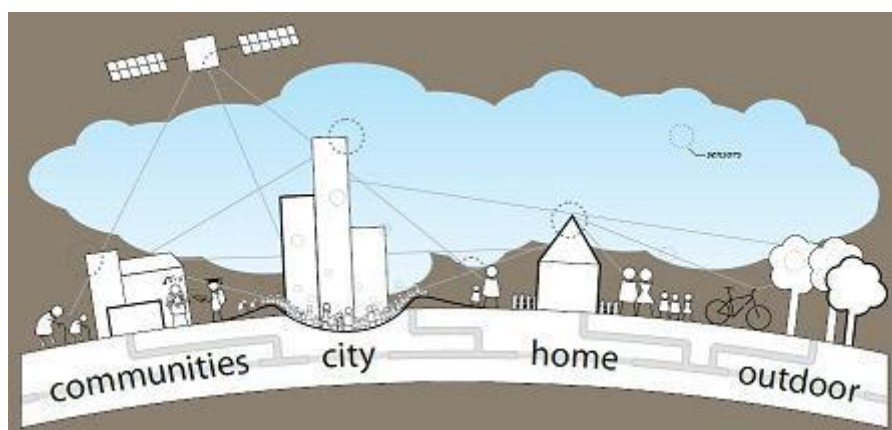


Figure 1: DiYSE architecture  
(ITEA 2 Magazine 2010, 16)

The project involves 29 European company and research partners in 7 countries and it is part of the ITEA 2 (Information Technology for European Advancement) cluster that is a strategic pan-European program for advanced pre-competitive R&D in software for Software-intensive Systems and Services (ITEA2 website). The Finnish consortium focuses on developing and evaluating technologies that empower elderly and disabled people as well as young children to create and share interactive experiences beyond limits of their residence or generation. The service design process followed for DiYSE project in developing the intended solution is given in Figure 2.

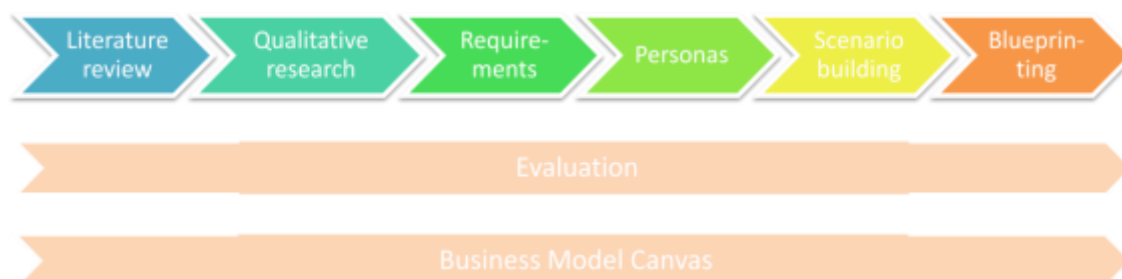


Figure 2: DiYSE - Service Design Process Map  
(Moonen 2012)

The service design process diagram given in Figure 2 guides in developing the intended solution. The evaluation and Business Model Canvas parts have been done throughout the service design process and so it is represented as a continuous parallel process. This study is as part of the Business Model Canvas phase which is represented by the bottom line.

#### 1.4 The case company

The second phase of the DIY-SE project, which started in March 2011 focuses on the development and evaluation of a symbol based messaging client named SymbolChat. This study is for this service. Stakeholders involved for this are University of Tampere and Laurea University of Applied Sciences. The Case Company for this thesis is these two stakeholders. However, University of Tampere owns the SymbolChat. Though Laurea University of Applied Sciences has been involved in service design phase, Laurea is not the owners. Next two paragraphs give a brief overview of the stakeholders.

**The University of Tampere (UTA)**, with its nine schools and some 15,000 degree students, is one of the largest and the most competitive universities in Finland and is a full-scale university with six faculties. This University is multidisciplinary and committed to scientific research and to advanced teaching. The hallmark of the university is sound, diverse research and teaching focussed on society, its economy, administration and culture and on the health and welfare of individuals. More information can be found out from their website <http://www.uta.fi>.

**Laurea University of Applied Sciences** operates in the Helsinki metropolitan area, one of the most competitive regions in the world. Laurea is one of the largest Universities of Applied Sciences in Finland with approximately 500 staffs and 8000 students on seven campuses. Laurea is a research - and development - oriented University of Applied Sciences focused on service innovations. Laurea is known for its pedagogical innovation, the Learning by Developing (LbD) model, which is built on a development project that is genuinely rooted in the working life, which aims to produce new practices and whose progress requires collaboration between lecturers, students and working life experts (Laurea website). More information can be found out from their website <http://www.laurea.fi>.

As said in the beginning of this section this study is performed for the service SymbolChat, readers might be anxiously waiting to know more on this service. Hence this paragraph briefly introduces the symbol-based chat by detailing its purpose with respect to the target customer. This chatting client is developed to serve two customer groups, one from Finland and other from India. Basically this service is used to communicate with others with the help

of symbol-based messages. In Finland this service allows intellectually disabled users to exchange messages with their family, friends, and support persons or with someone else whom they want to talk. In other hand, Indian community can reap its benefit by using this service to avoid the language barrier existing in India. More specifically, it is meant for normal Indians who want to communicate with others who lack a common language to converse. The application is more flexible in the sense that it allows users to personalize their interaction style. For instance the input and output modality can be altered to go with the user capability.

### 1.5 Structure of the study

The target of this thesis is to seek out issues that have to be taken to account in business model creation. The issues that company faces have been collected from literary sources and formulated into a map of questions. With this map of questions, answers are gathered from stakeholders to create a business model that is useable for the case company.

This report will give background information about the DiYSE project and the case company. The study reviews the known literature in the area of service business, ICT based services, intellectually disabled people and business models. Questions for stakeholders are prepared from literary sources. Data will be gathered from organization, will analyze the data, and will create a standardized business model for the case company. Finally some suggestions to improve the business are put forth to the case company. Table 2 illustrates the approach used for developing the business model for the case company, in a way the structure of the thesis.

Table 2: Structure of the thesis

<p><b>Main Study Question</b></p> <p><i>How to design a business model for a small &amp; medium sized organization that offers ICT based services?</i></p>	
<p>↓</p>	
<p><b>Service</b></p> <p><i>Section 2 collects a few definitions of Service and picks one that is more apt to ICT-based services. This section addresses first part of first study sub-question.</i></p>	
<p><b>Service Businesses</b></p> <p><i>Section 2.1 gives a picture of pure service businesses and addresses next part of first study sub-question.</i></p>	<p><b>Service Characteristics</b></p> <p><i>Section 2.2 lists out the four main characteristics of services and thereby addresses final part of first study sub-question.</i></p>

↓	
<b>ICT Based Services</b> <i>Section 2.3 details on services that take place through electronic means and answers to the second study sub-question.</i>	
↓	
<b>Intellectual Disability</b> <i>Section 3 defines the term intellectual disability and serves as background information to answer the third study sub-question.</i>	
<b>Degree of intellectual disability</b> <i>Section 3.1 lists down different categories of intellectual disability and selects the ones used in this study. This section also helps to answer the third study sub-question.</i>	<b>ICT for Intellectually Disabled People</b> <i>Section 3.2 details the importance of ICT in the life of intellectually disabled people. This section responds to the third study sub-question with the help of sections 3 and 3.1.</i>
↓	
<b>India and its linguistic diversity</b> <i>Section 4 provides background information about India and its three cities, Mumbai, Kanpur and Kolenchery. A short presentation of the specific country facts of India is given in this section. This section addresses the fourth study sub-question.</i>	
↓	
<b>Business Model Frameworks</b> <i>Section 5.1 explains the concept of business models used in service business and picks the one used for the study. This section addresses the fifth study sub-question.</i>	
↓	
<b>Business Model Canvas</b> <i>Section 5.2 elaborates on the business model canvas which is the tool used for this study and knowledge from this section is the basis for the seventh study sub-question.</i>	
↓	
<b>Methodology</b> <i>Section 6 consists of the methodology of the study, the introduction of the study process, design of the study, data collection and its analysis. It also discusses on the generalization possibility of the study and also on how to check the validity and reliability of the collected data.</i>	

↓
<b>Business Model Issues</b> <i>Section 7 lists out the issues to be considered for business modelling. This section gives answer to the sixth study sub-question.</i>
↓
<b>Data Analysis</b> <i>Section 8 describes the development of case company's business model and henceforth addresses the seventh study sub-question.</i>
↓
<b>Discussion and Conclusion</b> <i>Section 9 and 10 discusses on the findings and suggestions on how to modify the current business model.</i> <i>Section 11 concludes the study results by summarizing lessons learned and points to future directions. The issues that are discussed are the contribution of the study, reliability and validity of the results, further areas of the study and finally the managerial implications of this dissertation. The final study sub-question is treated in these sections.</i>

## 2 Service

What exactly is service? Is it the way the product is delivered? Is it the way the product can be used? Is it the behavior and attitude of the employees? Before we promise to the customer something that is subject to so many interpretations, we should clarify this term to ourselves. (CHIC hospitality consulting services 2010)

During 80's, how to define a service was discussed extensively. Yet so far, there is no common definition in the literature. To many people, services mean personal services such as auto-repair, dental surgery, legal work and consulting, or merely *customer service* (see Appendix A). However, lot of things comes under the word service, which is offered to support the company's core product.

In the service literature, the term service(s) have different outlooks, which nevertheless have similar inference. Some of the definitions are given in Table 3.

Table 3: Service Definitions

Author	Definition
Zeithaml, Bitner & Gremler (2009)	"deeds, processes, and performances provided or coproduced by one entity or person for another entity or person"
Grönroos (2006)	"processes that consist of a set of activities which take place in interactions between a customer and people, goods and other physical resources, systems and/or infrastructures representing the service provider and possibly involving other customers, which aim at solving customers' problems"
Edvardsson, Gustafsson, Roos (2005)	"Service is a perspective on value creation rather than a category of market offerings. The focus is on value through the lens of the customer, and co-creation of value with customers is key and the interactive, processual, experiential, and relational nature form the basis for characterizing service."
Vargo and Lusch (2004)	"the application, of specialized competencies (knowledge and skills) through deeds, processes, and performances for the benefit of another entity or the entity itself"
Fitzsimmons & Fitzsimmons (2006)	"a service is a time-perishable, intangible experience performed for a customer acting in the role of a co-producer"



Grönroos (2006) incorporated other elements into the concept of service when he defined a service as given in the table. According to Grönroos (2006, 319) ‘services emerge in “open” processes where customers participate as co-producers and hence can be directly influenced by the progress of these processes;’ while, traditionally, ‘physical goods are produced in “closed” production processes where the customer only perceives the goods as outcomes of the process.’ This means that the consumption and production of services are at least partly simultaneous processes and that the customer at least partly enters the production sphere, and the service provider at least partly enters the consumption sphere (Grönroos, 2006). In the Grönroos (2006) definition of service, in addition to emphasizing the process, Grönroos also states that services are provided as solutions to customer problems; a value-generating service provides a solution to customer problems, irrespective of whether this solution is based on a physical product or not.

Table 3 reveals that there are various definitions for services. Interestingly, it has been suggested that on a lower abstraction level, there is no general service definition (Edvardsson et al. 2005). In several definitions, keywords involved in the services definitions are said to be activities, deeds or processes and performance (Edvardsson et al. 2005; Lovelock 1991; Zeithaml & Bitner 2003; Vargo & Lusch 2004b). For this study the service definition provided by Fitzsimmons & Fitzsimmons (2006, 4) is suitable because it comprehensively defines also the essence of ICT-based services by giving a possibility to combine the intangible service dimension that can be provided for customer using tangible technological products as tools.

Four categories of services are service industries and companies, services as a product, customer service, and derived services. (Zeithaml & Bitner 2006, 4-6) Service industries and companies are business set-ups with central product as service. For instance pure service businesses can be seen as those companies working in transportation, accommodation, or health care.

Service as a product is an intangible product offering that is consumed at the time it is produced and creates extra value for the customers. As it is tough to gain competitive advantage through physical products alone, a lot of goods-producing companies are offering supporting services also like consulting, or after sales services. (Zeithaml & Bitner 2006, 5-9)

Customer service, on the other hand, is the set of activities offered to the customers as part of the company’s core products, in a way to support the product. This service is offered to meet the customer expectations and thereby to increase the customer satisfaction level. This in turn results in customer retention and loyalty that ultimately leads to increased revenue. This is entirely different from the above mentioned category, services as products.

Finally, derived service is explained in a bit abstract fashion. It treats the product value as exactly the same as the provided service with the good and not only the good itself.

## 2.1 Service businesses

Service business can be defined as firms that provide intangible products to consumers or other businesses. For instance, pure service businesses are firms working in health care, finance, insurance, banking, or repairs sectors. (Bovee & Thill 2005, 4-6)

Service businesses lean more towards *labor-intensive* (see Appendix A). That is, service businesses depend mostly on human resources rather than on capital assets like buildings, machinery, and equipment. Therefore, knowledge and skills of the personnel are very important in this type. Employees working under service business should be cared well and should be motivated for performing well with customers. This is very essential in service sector, because a poorly treated employee can break the relationship with a loyal customer. *Capital-intensive business* (see Appendix A) is associated with the risk of *Barriers to entry* (see Appendix A). Because of this service business can be easily launched in market than capital-intensive manufacturing business. However, the success of service business depends mostly on the experience attained in the particular field and so it takes a long time to glue ones foot in this service category. (Bovee & Thill 2005, 4-6)

## 2.2 Main characteristics of service

Despite of the various definitions for services, service characteristics are of four in number as agreed by a lot of authors; namely, intangibility, heterogeneity, inseparability (of production and consumption), and perishability (see Appendix A).

*Intangibility* states that services are not a physically existing object and so they cannot be touched, seen, smelled or tasted. However, service is composed of a sequence of activities for the benefit of customers. However, tangibles; for instance, in the form of a credit card, can occur. But for this type of tangibles, a service is associated which is the main play card. This type of nature of the service makes it hard to assess the quality component of the service.

*Heterogeneity* points to unique service which means that no two services are alike. The performance of the service-provider is not consistent, it varies from time to time depending on some external factors like his/her mood. Also each customer has unique demands and expectations of the service. This makes it a bit challenging to provide consistent service

quality. As the level of a service varies with lot of external elements, it is very hard to ensure high quality in service business. (Hill & O'Sullivan 2004, 33-35; Zeithaml & Bitner 2006, 23)

*Inseparability* means that when the service providers provide the required service, the customers will receive that service at the same time. Both these activities takes place at the same time and cannot be separated. Everyone including the employees and also the clients are part of the whole service production-delivery process. Neither employees nor clients could be separated from this process. (Hill & O'Sullivan 2004, 33-35; Zeithaml & Bitner 2006, 23-24)

*Perishability* of the service means that the service is no longer valid after its time of production. No one could stock it for future use. In the same way service return is also not possible. This nature makes it clear that a service disappears on the time of its consumption. A service company need to ensure customer's satisfaction on the provided service because these types of companies exist for providing service and a bad mark may affect their whole existence itself. So any problems related to customer service need to be fixed as early as possible. (Hill & O'Sullivan 2004, 33-35; Zeithaml & Bitner 2006, 24)

### 2.3 ICT based services

Information and Communication Technology (ICT) has become a central aspect of modern business. With the rise of information technology (IT) and the increase in Internet and mobile technology the scope for service innovation has grown enormously. In this relation services can be divided into two kinds; High-touch and High-tech services. High-touch services emphasize humanity and consumer patience and are mostly dependent on the people participating in the service processes. High-tech services are based on the automatic systems and technology used in the service processes. (Grönroos 2001, 84-85.)

One has to remember that also technology based services such as telecommunications or web services are in need of high-touch characteristic services when critical moments occur and e.g. helpdesk personnel is needed. If the high-touch interaction in the high-tech service process fails there are usually fewer opportunities to recover the mistake than in high-touch service processes, many times customers will not give second chances that easily with technology errors than with human errors. New technology also gives customers the means to access the services of a manufacturer or a service firm more quickly and easily. Internet makes services more accessible and that way it may improve interactions. (Grönroos 2007, 57, 192; Trott 2002, 238) The high-tech service includes ICT-based services. With the growing role of ICT in service provisioning and usage, electronic services have become a new type of service.

Communication can be described as the process of sending and receiving ideas, information, messages and feedback. There has been different type of modes of communication in the past in various parts of the world. The modern days make use of complex and multiple applications which could be referred to as Information and Communication Technology. Information and Communication Technologies, referred as ICT, have been defined by different commentators in various ways (UN ICT Task Force 2003; Skuse 2001; Michiels & Van Crowder 2001; World Bank 2003; Greenberg 2005 and Weigel & Waldburger 2004). The World Bank defines ICTs as “the set of activities which facilitate by electronic means the processing, transmission and display of information”. Many definitions focus particularly on the ‘newer’ computer-assisted, digital or electronic technologies, such as the Internet or mobile telephony. Some do include ‘older’ technologies, such as radio or television. Some even include the whole range of technologies that can be used for communication, including print, theatre, folk media and dialogue processes. Some focus only on the idea of information handling or transmission of data. Others encompass the broader concept of ICTs as tools to enhance communication processes and the exchange of knowledge. ICTs is viewed as a general term covers any communication device or application such as radio, television, phones, computer and satellite systems among others and its coverage also includes some services and applications associated with them.

For the purposes of this study, ICTs are defined as tools that facilitate communication and the processing and transmission of information and the sharing of knowledge by electronic means (Einterz 2001). This encompasses the full range of electronic digital and analog ICTs, from radio and television to telephones (fixed and mobile), computers, electronic-based media such as digital text and audio-video recording, and the Internet, but excludes the non-electronic technologies. This does not lessen the importance of non-electronic technologies such as paper-based text for sharing information and knowledge, but merely draws a boundary around the field addressed by this document.

### 3 Intellectual disability

In this section concepts covering intellectual disability (ID), which have been defined differently across the decades, are reviewed. According to the White Paper, Valuing People, ID is identified by the presence of “a significantly reduced ability to understand new or complex information, to learn new skills (impaired intelligence); with a reduced ability to cope independently (impaired social functioning); which started before adulthood, with a lasting effect on development” (Department of Health 2001, 14).

It is emphasized that people with ID, regardless of the impact of their disabilities, share a common humanity with that of their fellow citizens in their communities, and in the wider society in which they live. Most people desire love and a sense of connection with others; they wish to be safe, to learn, to lead a meaningful life, to be free from ridicule and harm, to be healthy, and free from poverty, and in this respect people with ID are no different to any of us. Moreover, technological advancements especially in the field of Information Technology and Internet made possible ICT based services for the betterment of the everyday life of intellectually disabled people.

Historically, ID has carried multiple names, such as mental retardation, mental deficiency, mental handicap, mental sub-normality, severe sub-normality or oligophrenia, mental enfeeblement, insanity, and different levels of ID have been feeble-minded, imbecile, idiotia and moron (Gath 1992; King, State, Shah, Davanzo, Dykens 1997; Williams 1996). In the literature, the following terms are used: mental retardation (emphasising the neurological dysfunction), and intellectual disability (emphasising the primary dysfunction, widely used in the United States). In this study, the author prefers the term intellectual disability, which focuses on the aetiological factors leading to cognitive, adaptive and behavioral manifestations.

The term was introduced in the Journal Mental Deficiency Research in 1992 (Frazer 1991) and after that used widely by associates of International Association of Scientific Study of Intellectual Disability (IASSID) in 1995. The intellectual development of persons with ID has been reported to continue throughout the adult life (Eyman & Widaman 1987; Trower & Nicol 1996), but the *intelligence quotient, IQ*, (see Appendix A) measures have been found rather stable with some increase for persons with mild and moderate ID (Fisher & Zeaman 1970), but rarely in severe and profound ID (Goodman 1976).

Mental retardation (MR), term used by the WHO definitions as synonym to ID, refers to substantial limitations in present functioning. Mental retardation term is defined as “a condition of arrested or incomplete development of the mind, which is especially characterized with impairment of skills manifested during the developmental period, which contribute to the overall level of intelligence i.e. cognitive, language, motor and social abilities” (WHO 1995). It is characterized by significantly sub-average intellectual functioning, which exists concurrently with related limitations in two or more of the following applicable adaptive skill areas: communication, self-care, home living, social skills, community use, self-direction, health and safety, functional academics, leisure and work. By definition MR manifests before age 18. (Luckasson et al. 1992) It is evaluated with psychological testing (IQ < 70) and adaptive behavior (WHO 1995). Environmental aspects need to be considered as some individuals may behave normally in one environment and subnormal in another.

The WHO has divided ID into three basic areas: impairment, disability and handicap. Impairment is any loss or abnormality of psychological, physiological, or anatomical structure or function. A child unable to bear weight on the feet and inability to move the legs is impairment. A disability is any restriction or lack (resulting from impairment) of ability to perform an activity in the manner or within the range considered normal for a human being. A child cannot walk is defined as disability. A handicap is a disadvantage for a given individual, resulting from an impairment or disability, which limits or prevents the fulfillment of a role that is normal (depending on an age, sex, social and cultural factors) for that individual (WHO 1980). A child has cerebral palsy (see Appendix A), this is called handicap which became an obstacle for him to perform a normal role in the school, home and in the society.

There was negative connotation between all the terms defined by the World Health Organization. According to the United Nations Standard Rules, these terms are defined as:-

*Disability* means that a person can become disabled due to mental illness or medical conditions and intellectual, physical and sensory impairment. Such conditions may be transitory or permanent in nature.

*Handicap* means that person cannot take active part in the activities of community like others. This term emphasizes on the organized activities of disabled people like communication, information etc. and limitations in the environment. These limitations prevent the disabled people to take part with other people.

### 3.1 Degree of intellectual disability

The degree of intellectual disability (ID) has been divided by intelligence quotient (IQ) scores. For many years, ID has been divided into a number of categories to reflect its nature and extent. These tended to range from 'borderline' through 'mild', 'moderate' and 'severe', to 'profound' (Table 4). This represents one understanding of ID but there are others. This understanding uses the World Health Organization classification system that defines the degree of disability according to how far an individual is from the normal distribution of IQ for the general population.

Table 4: Classification of ID

IQ Score	Classification
<20	profound ID
20-34	severe ID
35-49	moderate ID
50-69	mild ID
71-84	borderline of intellectual functioning
Over 84	Normal Intelligence

Using WHO classification system, an individual who consistently scores more than 2 Standard Deviations (SD) on an IQ test, that is, a measured IQ of <70, is said to have ID. Individuals whose IQ is 50-69 are generally identified as having mild ID (F70, see Appendix A); those with an IQ of 71-84 are said to be on the borderline of intellectual functioning; moderate ID (F71, see Appendix A) is identified when the IQ is 35-49; the term ‘severe intellectual disability’ (F72, see Appendix A) is reserved for people whose IQ is 20-34; finally, the term ‘profound intellectual disability’ (F73, see Appendix A) refers to those with an IQ of <20. Normal intelligence has an IQ over 84. The different categories of ID are summarized in Table 4. This study concentrates on moderate ID and mild ID.

### 3.2 ICT for intellectually disabled people

Information and Communication Technology has been identified as an important aspect of the wider strategy for the social inclusion of Intellectually Disabled People. ICT is heralded as enabling Disabled People to “participate fully in the social and economic life of their communities” (Fichten, Asuncion, Barile, Fossey & De Simone 2000).

ICT is a significant force in terms of choice and opportunity for Disabled People. In a 2002 survey it was reported that: 54% of Disabled People saw internet access as essential to their quality of life; compared to only 6% of individuals in the general population (Knight, Heaven & Christie 2002).

Frank Bowe (1990), a leading academic in the field, writes that “[ICT] can now help the blind to ‘see’, the speech-impaired to ‘speak’ and the hearing-impaired to listen”. ICT offers the old and the young alike an opportunity to overcome social barriers to interaction and communication that can be caused by the lack of provision for impairments or life-long

limiting illness. ICT has also been identified as playing a significant role in offering severely Disabled People an increased degree of independence in everyday life (Mangan 1993). ICT gives the Disabled Person an improved quality of life through autonomy and empowerment (Andrich & Besio 2002).

#### 4 India: Background

The Republic of India is the seventh-largest country in the world with respect to its geographical area. Its terrain ranges from an elevated tableland in the south, to deserts in the west, the Himalayas Mountains in the north, and flat to rolling plains along the Ganges River.



Figure 3: Map of languages in India

[Mapsofindia website 2012]

India is a large country comprising of 28 states, nine union territories and 593 districts (Censusindia website). Figure 3 presents the map of India. Since 1947, the year of its independence, it is the world's largest democracy. An elected President is the Head of State. Executive power resides with the Prime Minister, while legislative power resides with the



Upper House (Rajya Sabha) and the Lower House (Lok Sabha). The 28 states have their own elected governments, and the nine union territories are governed by an administrator appointed by central government (except for the territories of Delhi and Puducherry). A governor for each state is nominated by the president. (The Indian Constitution 2010)

People speak diverse languages in each of these states. Also different cultural customs and practices exist in India. Figure 3 shows the different languages prevalent in India. For instance, to a minimum 29 languages and also 200+ dialects exist throughout India. This in turn shows the existing variations in culture within India. These variations in culture and languages may result in some differences in the use of information and communication technologies within different parts of India. This study selects three cities, Mumbai, Kanpur and Kolenchery, to collect customer opinions on the service. A brief overview of these cities is given in section 4.2.

#### 4.1 Linguistic diversity in India

The phrase “Unity in Diversity” describes India perfectly. It is not an exaggeration to state that India is a land of huge diversities. India’s diversity is characterized by multifarious identities of caste, religion, race, language, and ethnicity. India is home to all the world’s religions and other social differences, especially caste, language, and ethnicity. These identities cut across and intersect each other in complex ways.

India’s socio-cultural mosaic is characterized by a linguistic diversity that is extreme with over 1000 languages and dialects. There are at least 28 languages with more than a million speakers each. Hindi, spoken by more than a third of the population and concentrated mostly in north and central India, is the recognized official language of India along with English.

Besides Hindi, Indian people speak a number of language and dialects. The Constitution of India has accepted 18 national languages. Also twenty two official languages and over thousands of spoken languages are prevailing. Over hundreds of mother tongues are also there. These languages existing in India has its own history and richness. It is not possible to learn all of these languages and therefore it poses barriers to communicate with others who don’t have a common language to communicate.

Additionally more than half of the people are literate only in their mother tongue and this makes it hard for them to communicate with other state residents. India is also known for its tourist attractions ranging from northern part to southern part of India. During 2011, total Foreign Tourist Arrivals (FTA) in India was recorded as 6.29 million (World Tourism

Organization 2012). Mingling with foreigners also is very difficult because of this language barrier.

#### 4.2 Indian cities: Mumbai, Kanpur and Kolenchery

*Mumbai* is situated on the west coast of India. This city is the capital of Maharashtra state and is home to around 15 million (2011 census). Mumbai, previously known as Bombay, is a main cosmopolitan city of India (mumbainet website) with an international airport and an established public transport system. Though inhabitants of Mumbai speak Marathi, varieties of other Indian languages are also popular in Mumbai. The heart of Mumbai is considered as South Mumbai and is entirely different comparing to the suburbs.

The financial capital of India is considered as Mumbai (mumbainet website) with several multinational corporations making its foot rooted there. Henceforth this city is more open to western culture and also Indian film industry widely known as Bollywood and the top entertainment TV production units are there in this city. Consequently, this city is the starting point of the foremost cultural and fashion trends spreading throughout India.

*Kanpur, on comparing to Mumbai*, is considerably a smaller city. It has a population of 4.1 million people (Uttar Pradesh government website). Located in the state of Uttar Pradesh the language spoken in this city is Hindi (kanpurcity website; Indian government website). Though fabric and leather manufacturing business is popular in this city, development of Kanpur moves only in a snail pace compared to Mumbai. To name a few, international companies and western style restaurants are not popular in Kanpur and also transportation systems available for public are mostly three - wheelers referred as auto-rickshaws. In short, comparing to Mumbai this city has a very different landscape.

*Kolenchery* is a village in Ernakulam district situated in midland Kerala state between the Western Ghats and the coastal strip of Arabian Sea. The capital of Kerala is Trivandrum. The State is one of India's smallest States, but has one of the highest population densities. To be similar with Kanpur, Kolenchery is also in the stage of development where an IC technology like a mobile phone or tablet is new and exciting and represents being smart and advanced, in other words it represents status. In short, there is a lack of most technologies ranging from power supply to communications. Here the economy is primarily based on agriculture and animal husbanding.

## 5 Business model

### 5.1 Business model for service businesses

The business model concept is a relatively young topic (Osterwalder, Pigneur & Tucci 2005). It is often said that business models have always existed but only recently have they turn out to be of great interest for both, academics and practitioners (Sosna, Trevinyo-Rodriguez & Velamuri 2010). The term can be considered to be relatively new despite the fact that it first appeared in an academic article back in 1957 (Bellman & Clark 1957).

It was not until the late 1990s when the term rose to prominence. Since then a myriad of definitions have become available and the amount of literature is still growing. Though the term “business model” has become an inevitable part of managers’ and scholars’ vocabulary, differences in definition cause challenges and often misunderstandings about the structural nature, its components and the functions of the business model. The absence of a unified definition also causes confusion in terminology - the term “business model” is often mixed with such terms as strategy, revenue model, economic model etc. (Morris, Schindehutte & Allen 2005). Some key definitions from literature are highlighted in Table 5.

Table 5: Overview of existing business model studies

Author(s) (Year)	Business model definition	Elements mentioned in the model
Chesbrough & Rosenbloom (2000)	Framework that takes technological characteristics and potentials of the company as inputs, and converts them through customers and markets into economic outputs.	<ul style="list-style-type: none"> <li>○ Value proposition</li> <li>○ Market segment</li> <li>○ Structure of value chain</li> <li>○ Position in value network</li> <li>○ Competitive strategy</li> <li>○ Cost structure and profit potential</li> </ul>
Amit & Zott (2001)	The business model concept as depicting “the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities”.	<ul style="list-style-type: none"> <li>○ Transactions content</li> <li>○ Transactions structure</li> <li>○ Transactions governance</li> <li>○ Value creation design</li> </ul>
Magretta (2002)	Business model explains questions related to the working of an enterprise like customer, customer value, financial aspects etc.	<ul style="list-style-type: none"> <li>○ Customer definition</li> <li>○ Value to customer</li> <li>○ Economic logic</li> <li>○ Revenue logic</li> </ul>

Afuah (2004)	Business models are about making money and most firms are in business to make money	<ul style="list-style-type: none"> <li>○ Customer value</li> <li>○ Scope</li> <li>○ Pricing</li> <li>○ Revenue source</li> <li>○ Connected activities</li> <li>○ Implementation</li> <li>○ Capabilities</li> <li>○ Sustainability</li> </ul>
Osterwalder, Pigneur & Tucci (2005)	A business model is a tool that helps to express the business logic of an enterprise. It comprises of the architecture of the company by sectioning the tool to describe four elements i.e. customer value, customer interface, infrastructure management, and financial aspects.	<ul style="list-style-type: none"> <li>○ Value proposition</li> <li>○ Target customer</li> <li>○ Distribution channel</li> <li>○ Relationship</li> <li>○ Value configuration</li> <li>○ Core competency</li> <li>○ Partner network</li> <li>○ Cost structure</li> <li>○ Revenue model</li> </ul>
Johnson, Christensen & Kagermann (2008)	A business model comprises of four elements: customer value proposition, profit formula, key resources, key processes. These elements as a whole create and deliver value to the customer.	<ul style="list-style-type: none"> <li>○ Customer value proposition (incl. target customer, offering, job to be done)</li> <li>○ Profit formula (incl. revenue model, cost structure, margin model)</li> <li>○ Key resources</li> <li>○ Key processes (incl. metrics, norms &amp; rules)</li> </ul>
Storbacka & Nenonen (2009)	Business model is a configuration of interrelated capabilities. It emphasizes the governing of the content, process and management of the interaction and exchange in a value co-creation environment.	<ul style="list-style-type: none"> <li>○ Content of interaction &amp; exchange</li> <li>○ Process of interaction &amp; exchange</li> <li>○ Management of interaction &amp; exchange</li> </ul>

Even though the reviewed literature reveals several business model concepts, certain similarities could be identified among the definitions. If we look at the definitions given in Table 5 it is quite clear that *customer value creation* is the core element in these definitions though it is expressed in different words like ‘value proposition’, ‘value creation design’,

‘value to customer’ etc.. Other similar elements identified from the definitions are: firm’s value network, revenue logic, resources and capabilities of the firm and target market.

Though there is no commonly agreed definition of the business model, it is possible to find some categorizations of the existing business model literature. Osterwalder, Pigneur & Tucci (2005) classified the business model articles into three categories: (1) studies that describe the business model concept as an abstract overarching concept that can describe all real world businesses, (2) studies that describe a number of different abstract types of business models or classification schemes, and (3) studies presenting aspects of or a conceptualization of a particular real world business model. (Storbacka & Nenonen 2009a)

Among the authors listed in Table 5 Osterwalder (2004) brings a systematic view of model building. He looks into ways to create a generic tool that can manage business models in the complex environment. Thus Osterwalder (2004) proposed to use nine interdependent elements organized into four pillars in his business model.

The business model of Osterwalder (2004, 15) was later developed by Osterwalder and Pigneur (2009) into a business model canvas, which is “a strategic management tool that is a visual template resembling that of a painter’s canvas, preformatted with the nine blocks comprising of the business model. Ultimately it serves to sketch new or existing business models”. Osterwalder’s work (Osterwalder & Pigneur 2009, 14) shows that, a business model should explain an organization’s logic of creating, delivering, and capturing value. The business model developed by Osterwalder (2004) and its practical visualization (business model canvas) developed by Osterwalder & Pigneur (2009) is used in this thesis.

Osterwalder’s business model ontology provides a structure, with components and relations between the components, to describe the case organization. Additionally Osterwalder’s business model ontology is the most thorough of the business models in literature. This is the reason why Osterwalder’s business model is selected for this study.

## 5.2 Business model canvas

Alexander Osterwalder studies in his thesis (Osterwalder 2004) a way to create a generic business model and furthermore make a software-based tool that can be used in managing in complex and fast changing business environment. In his view business model describes the value company produces to its customer segments and also the structure of company and its network of partners that produce and deliver the value together in order to make profitable and sustainable revenue.

A business model canvas can be described by looking at a set of nine building blocks which are given in Table 6. The nine elements are further grouped to four categories or pillars as Osterwalder calls them *Product*, *Customer Interface*, *Infrastructure Management* and *Financial Aspects*. These pillars as well as the elements they contain are described in the following sections.

Table 6: Osterwalder's nine building blocks grouped together

Pillars	Elements
Product	Value Proposition
Customer Interface	Target Customer (Customer Segments)
	Distribution Channel
	Customer Relationships
Infrastructure Management	Value Configuration
	Capability
	Partnership
Financial Aspects	Cost structure
	Revenue Model

Pillar I consists of Value Proposition as the element which is placed at the centre of the business model. It describes on the solution intended to solve customer issues. It also shows its advantage over competitor's products. Pillar II consists of three elements. *Customer Segment* deals with target customers involved and recognizes their needs. *Distribution Channel* shows the channels used to be reach the target customers, for instance it can be through web or by means of a partner store. The third element in this group, *Customer Relationships* depicts the relationship type the company wants with its customer segments.

Similarly, Pillar III also includes three elements. First element *Resources* lists the company assets needed to fulfill the value delivery like machineries, employees etc. The second element *Key Activities* shows the activities required to fulfill the delivery process. It includes development, production, deployment etc. The third element *Partner Network* lists the network of partners needed to accomplish the aim. These partner networks can provide the service more efficiently in less time and money. Pillar IV contains two elements. The last two elements deals with financial information and concentrates more on the cost and revenue. The element *Cost Structure* lists the costs involved in the process and the next element

*Revenue Streams* shows the money flow from customers to the company in the form of transaction fee or subscription fee.

### 5.2.1 Product

The first part in the model is the product that describes “What business the company is in, the products and the value propositions offered to the market” (Osterwalder 2004, 42). Product is the company’s offering to its customers to create value. It also gives an idea of its differentiation to its competitor products. The element *value proposition* is placed in this block. (Osterwalder 2004, 49)

The *Value Proposition* comes as the first among the nine elements (Osterwalder 2004, 49), and it defines the particular offering developed as part of the business (Osterwalder & Pigneur 2009, 22). Quoting Osterwalder (2004, 43) a value proposition “is an overall view of a company’s bundle of products and services that are of value to the customer”. It describes the way a firm differentiates itself from its competitors and is the reason why customers buy from a certain firm and not from another (Osterwalder 2004, 50).

It can be a service that helps the customer to get a critical task done. The customer will value a service offering, if the offering provides a solution to a critical task for the customer. Designing such a value proposition, however, is only possible, if the company understands the customer’s problems, the product, challenges, processes and the markets. Table 1 in Appendix C lists questions that a good value proposition would address (Osterwalder & Pigneur 2009, 23).

### 5.2.2 Customer interface

The second pillar, customer interface, covers all customer related aspects. According to Osterwalder (2004, 42) customer interface is to identify “Who the company’s target customers are, how it delivers them products and services, and how it builds a strong relationships with them”. This comprises the choice of a firm’s target customers, the channels through which it gets in touch with them and the kind of relationships the company wants to establish with its customers (Osterwalder 2004, 60). It describes the company’s chosen method and the target group to deliver the value it is offering via Value Proposition.

Target Customer (Customer segments) is the second element in the model (Osterwalder 2004, 60). It describes the segment of customers the company chooses to target for its value offering. Targeted customers have certain set of criteria that are used to identify the people that belong to the selected segment. Choosing the correct criteria and through that the

correct segment is essential because this way company can better choose the best way to get maximum attraction effect for the allocated resources. Table 2 in Appendix C lists critical questions regarding the target customer. Different types of customer segments are Mass market, Niche market, Segmented, Diversified and Multi-sided platforms (or multi-sided markets) (see Appendix A).

The Distribution Channel (CH) is the third element in the model (Osterwalder 2004, 63). This element contains information about how the company reaches the targeted customers, so it lies between the target customer and value offering. Its purpose is to make it possible to deliver the right amount of right products at the right time to the right people. The limiting factors in this are costs, required investment and limitations in flexibility. Company should try to message the potential customer during all four phases of the customer buying cycle which are awareness where customer needs to be made aware of the value offering and attracting them to try the product, evaluation where company should match the customers value needs with their offering, purchase where the transaction needs to be convenient and after sales where customer is provided additional value through manuals, FAQ and other means and not forgotten. Table 3 in Appendix C lists questions used to analyze the distribution channels to reach the targeted customers. The different channel phases (Osterwalder & Pigneur 2009, 27) are Awareness, Evaluation, Purchase, Delivery and After sales.

The fourth element in the model and the last element in Customer Interface category is the Relationship, (Osterwalder 2004, 71) which defines what kind of relationship a company wants with its customers while keeping in mind that resource needs that have to be allocated to upkeep it. Current trend is to move from traditional simple transactions to more complex and long lasting relationships so the company needs to think how much it wants to invest resources in acquisitions, retention and add-on product sales for each customer. Also technological advances like Internet need to be taken into consideration in this area. Table 4 in Appendix C lists questions used to analyze the relationships needed with the customer segments. Several categories of customer relationships are Personal assistance, Dedicated personal assistance, Self-service, Automated services, Communities and Co-creation (see Appendix A) (Business model generation 2012).

### 5.2.3 Infrastructure management

The third pillar of Osterwalder business model is Infrastructure Management, which defines the how value is created part of the model (Osterwalder 2004, 79). It defines, who the company's target customers are, how it delivers them products and services, and how it builds a strong relationships with them (Osterwalder 2004, 42). It contains information about the



complex interactions between company, its strategic partners, suppliers, customers and community. In other words, this category defines the capabilities of the business model and the resources it has available. Also the information reveals who owns and provides the required resources, who is responsible in the execution of the activities and how are the activities related to each other. The elementary goal is to make possible to deliver the value proposition and maintain customer interfaces (Osterwalder 2004, 79). This comprises the *Value Configuration* of the firm, in other words the activities to create and deliver value, and, the relationship between them, the in-house *Capability*-ies and those acquired through the firm's *Partnership* network model (Osterwalder 2004, 79).

The Value Configuration (Key Activities) is the fifth element in the model and the first element in Infrastructure Management category. The Value Configuration describes the arrangement of activities and resources that are necessary to create value for the customer (Osterwalder 2004, 43). It shows all necessary actions, and the links that combine various capabilities in order to create the total value company proposed to the customer. There are three types of value configurations: chain, shop and network. Chain is set of capabilities chained back-to-back in order to sequentially transform the inputs into outputs. Shop type tries to discover what the client needs, figure a way to fulfill the need and iteratively improve the process. In Network configuration a company is not involved in the actual production, instead it acts as an intermediary between customer and the producer and the value it provides is the linking of the two parties. Osterwalder & Pigneur (2009, 37) suggests four questions to address the key activities which are listed in Table 5 in Appendix C. These activities, however, not only concern the customer value proposition, but also relate to the channels, customer relationships and revenue streams. (Osterwalder & Pigneur 2009, 36) Key Activities can be categorized as Production (Designing, developing, and delivering of the product), Problem solving (solutions to customer issues) and Platform/network related Key Activities (Osterwalder & Pigneur 2009, 37).

Capability (Key Resources) is the second element in this category and sixth overall. Osterwalder (2004, 43) defines a capability as the ability to execute a repeatable pattern of actions that is necessary in order to create value for the customer. Its description is that it is repeatable actions that use the resources to create the products and services to the market. Company uses the capabilities in order to provide the value proposition. Capabilities can be inside the company or other companies or even the customers can perform them. Critical questions used to analyze the necessary key resources needed to offer the customer value proposition is given in Table 6 of Appendix C. These resources, however, not only concern the customer value proposition, but also relate to the channels, customer relationships and revenue streams (Osterwalder & Pigneur 2009, 34). Key Resources (KR) can be categorized as Physical (includes physical assets such as manufacturing facilities, buildings, vehicles,

machines, systems, point-of-sales systems, and distribution networks), Intellectual (includes intellectual resources such as brands, proprietary knowledge, patents and copyrights, partnerships, and customer databases), Human (includes human resources) and Financial (includes financial resources and/or financial guarantees, such as cash, lines of credit, or a stock option pool) (Osterwalder & Pigneur 2009, 35; Business model generation blog 2010).

The seventh element in the model and the last element in the category is Partnership (Key Partnerships); it maps the capabilities between the various companies that are within the partner network (Osterwalder 2004, 89). Osterwalder's (2004, 89) definition is "a Partnership is a voluntarily initiated cooperative agreement formed between two or more independent companies in order to carry out a project or specific activity jointly (to create value for the customer) (Osterwalder 2004, 43) by coordinating the necessary Capability-ies, Resources and Activity-ies". Traditionally these have been joint ventures between companies but nowadays formation of strategic alliances is more common. Strategic alliances aim to create and enhance the competitive positions of its members. Alliance members can exchange and share capital, technology and assets and also co-develop their products. Alliance operations allow companies to jointly coordinate the skills and resources so each company does not have to take risks alone and face competition from the other alliance members. Questions regarding Key Partnerships (KP) are listed in Table 7 of Appendix C. Three motivations for creating partnerships are Optimization and economy of scale, Reduction of risk and uncertainty & Acquisition of particular resources and activities (Osterwalder & Pigneur 2009, 39).

#### 5.2.4 Financial aspects

The last part in Osterwalder model contains the financial aspects of business. Financial aspects identify, "What is the revenue model, the cost structure and the business model's sustainability" (Osterwalder 2004, 42). The part is the outcome of the other areas in the model. The part is composed of the *Cost Structure* and *Revenue model* of the company and it is the most transversal part because all other pillars of the model have large influence towards it. Financial aspects of the company determine the profit making logic and thus how the company is able to compete in the market.

Cost structure is the first element in this category and eighth overall. Cost structure of the company contains information about all the costs company creates in creation, marketing and delivery of the value it brings to the customers (Osterwalder 2004, 101). In other words it represents all the things company needs to operate in monetary values (Osterwalder 2004, 43). It sets pricing to all the resources, activities, assets and networking costs company needs in its operation. Author suggests that there is an important cost saving and value creation opportunity for company if it focuses on its core competences and relies on its network to

fulfill its other competence needs. Cost structure is divided to a set of accounts that are revenue, cost of goods sold, gross margin and operation expense costs. Operation expenses are split further into R&D, services and marketing and general expenses for more detailed handling. Dividing the monetary values in the cost structure this way makes it easier to manage and its documentation becomes clear. Questions on Cost structure (C\$) are listed in Table 8 of Appendix C. Two broad classes of business model Cost Structures are Cost-driven which focuses on cost minimization and Value-driven which focuses on creation of value. Value-driven business model is characterized by high degree of personalized service and premium value propositions. Characteristics of Cost Structures are Fixed costs, Variable costs, Economies of scale and Economies of scope (Osterwalder & Pigneur 2009, 41).

Last and ninth element is the Revenue Model (Revenue streams). The Revenue Model describes the way a company makes money through a variety of revenue flows (Osterwalder 2004, 43). This measure the ability to translate the value company produces to the customers into money and is composed of incoming Revenue Streams and Pricing components (Osterwalder 2004, 95). Company can have several revenue streams and each stream has its own pricing mechanism. Author states that it is increasingly important to focus on the customer group's willingness to pay because this varies between different customer groups. It is efficient for the company to charge different prices from different customers. The thesis categorizes the revenue streams to five groups based on the nature of the revenue. These groups are Selling operations where the ownership of the goods is exchanged for money. Lending operations, where goods are temporarily given to customer for a period of time. Licensing where permission to use something nonmaterial company owns is sold. Transaction-cut where company gets part of the money, that is moved in the larger transaction. The large transaction itself is handled by network of companies. And last Advertising where other company pays to have their products publicly displayed by your company.

Pricing which is the second part of the revenue model is also divided to groups depending on their characteristics. Fixed pricing is, as name suggest, element that has fixed price that is not dependant on the buyer or real time market conditions. These are usually pay-per-use, subscription based or menu style pricing schemes.

Differential pricing group differ from fixed pricing in that the price changes according to the products or customers profile, are volume dependant or are linked to customers preferences but are not based on real time market conditions. Differential pricing changes according to volume, product characteristics or product features. Profiling price according to customers, which belongs to this group, has just recently become more popular as computerized customer management systems are becoming more common.

Last pricing group is the market pricing that is based on the real-time market conditions. The mechanisms in this pricing in this group are basic bargaining, that has existed as long as business has been done. Yield management, which is commonly used in airline ticket sales for varying prices based on reservation status, Dynamic Market where pricing is determined by large amount of buyers and sellers real-time like stock market, and last auctions and reverse auctions where highest bidder, or lowest in case of reverse auction, gets the value or job. Questions on Revenue Streams (R\$) are listed in Table 9 of Appendix C. Different ways to generate Revenue Streams are Asset sale, Usage fee, Subscription fees, Licensing, Brokerage fees, Advertising and Lending/Renting/Leasing (Osterwalder & Pigneur 2009, 31-32).

The relationships between the nine components are depicted in Figure 4. A template for the business model canvas is attached to this report as Attachment 1.

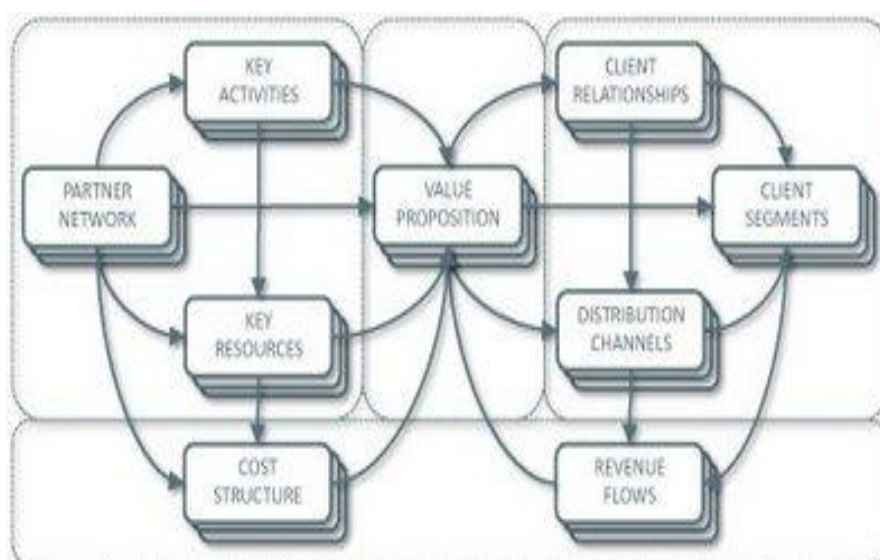


Figure 4: Osterwalder's nine building blocks and its relationships (Nonlinear Thinking website)

The right side of Osterwalder's business model (Figure 4) emphasizes value, while the left side is predominantly cost driven. Financial considerations (costs, revenues) are on the bottom and value is at the center with connections to partners and customers.

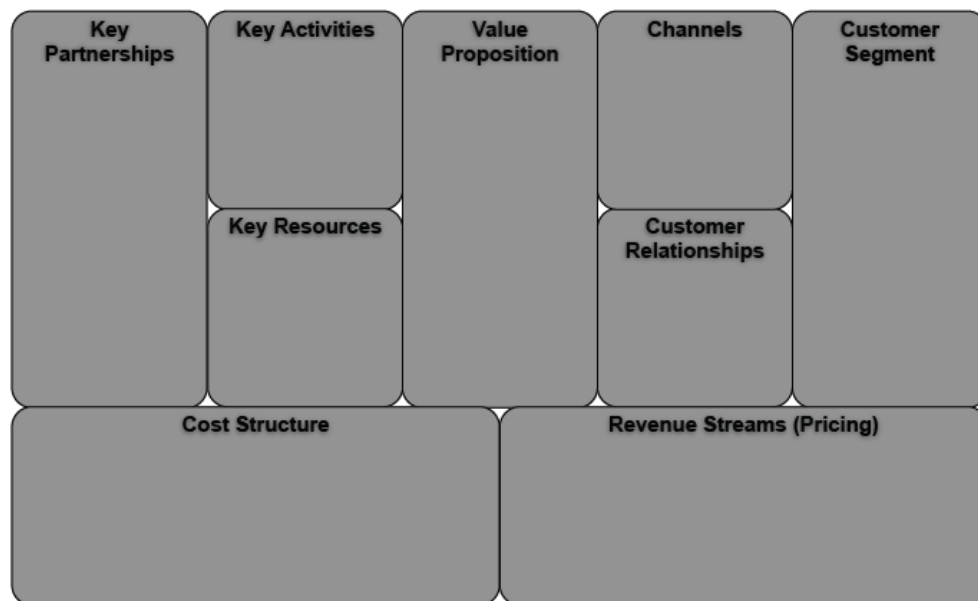


Figure 5: The Business Model Canvas

Business model design template is given in Figure 5. The most interesting feature of this canvas is that the business logic of a company can be sketched in one paper. The individual elements of the canvas are known to each and every business people. Hence the simplicity to depict the business logic on a single page is the main attraction of this model.

## 6 Methodology

This section presents the methodological approach used and gives an explanation of how this study is conducted. An explanation is given of the chosen tools, alongside of the reason for this choice. After that, the approach of getting to the solution is described, followed by a description of criteria to test the validity and reliability of this solution. The intermediate steps taken to reach this solution are explained, and finally some other details on how to find required information are mentioned.

The purpose of this thesis is to design a business model to develop ICT based services for intellectually disabled people. To be able to do this, Alexander Osterwalder's (2009) business model canvas is selected.

There are two basic research types: quantitative and qualitative. Quantitative research is numeric by nature and qualitative deals with meanings. In qualitative research the aim is to form a holistic view to the subject. Qualitative research type is inductive and is therefore commonly used to form new theories, models and concepts. Typical feature of qualitative research is that the research plan shapes as the research process goes ahead. (Hirsjärvi, Remes & Sajavaara 1997, 123-153) The research type adopted here is qualitative.

### 6.1 Design of study

As the nature of 'Business model generation' indicates the social science research methods should be applied rather than quantitative study. In this regard, this study uses qualitative research which is "an inquiry process of understanding" where the researcher develops a "complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting" (Creswell 1998, 15). The motivation for selecting qualitative research is because the qualitative research methods are designed to help researchers understand real life situations, more specifically to understand people, organizations, organizational resources, processes, relationships etc. Kaplan and Maxell (1994) argue that the goal of understanding a phenomenon from the point of view of the participants and their particular social and institutional context is largely lost when the textual data are quantified.

### 6.2 Data collection for business model designing of the case company

The business model could be created only by answering the questions prepared after analysing the most important issues. In this regard open-ended interviews would best inform the map of questions and so the qualitative research is based on open-ended interview

methods. The open-ended interview method is based on interviewing without constraints of pre-coded questions (Kent 2007, 99). To be more specific, data collection is done by conducting open-ended interviews with stakeholders during the workshops in order to understand the company and the services provided. The researcher documented and analyzed the gathered information.

The reason for choosing interviews is that it contributes to the deep description of the organization and the issues considered. Additionally, subjects like business modelling and management information are of a subjective and complex kind. This would have made it hard to choose data collection methods such as questionnaires, since it would have given interviewees the possibility to prepare in advance for the interview and also the interviewer can make sure that the answers given are exact. In addition, questions regarding this kind of subjects sometimes need to be rephrased to make the respondent understand the correct meaning of the question, which is hard to do with other data collection methods than interviews.

### 6.3 Method of execution

The task sequences that are followed in order to collect data are given in this section. Table 7 summarizes the meeting minutes with stakeholders. The guideline questionnaires were sent to the participants before the interview so that interviewees can prepare beforehand. Workshop was conducted with one of the stakeholder, Laurea University of Applied Sciences.

Workshops are teaching and learning arrangements, usually in small groups, that are structured to produce active participation in learning. Traditionally, workshops provided participants with some opportunity to practice skills and receive feedback. However, current usage is so loose that any learning event that aspires to engage the learners actively may be called a workshop. (Tiberius & Silver 2001)

In the workshop all together three person participated including the researcher. Two of them were from Laurea University of Applied Sciences. In order to get data to fill the business model canvas, open-ended interview was conducted before sketching the canvas with stakeholders. During the interview sometimes follow up questions were necessary in order to make a complex reasoning more understandable or to make the interviewee express her- or himself more clearly. While conducting the interview the Business Model Canvas of Osterwalder and Pigneur (2009) was also used in order to encourage respondents to describe their view of the organization. During the interview, the researcher took notes to record the data and filled up the canvas.

Table 7: Meeting minutes with stakeholders

First Contact Point	
When	29 October 2011
Where	Laurea University of Applied Sciences
Who	Two representatives from Laurea and Researcher
How	Workshop (questionnaire, open-ended interview)
Why	To get an initial understanding of the SymbolChat application
What	First version of business model canvas (see Appendix D - Figure 12)
Second Contact Point	
When	27 January 2012
Where	Laurea University of Applied Sciences
Who	Two representatives from Laurea and Researcher
How	Workshop (questionnaire, open-ended interview, canvas sketching) Materials Used: A very large print of a Business Canvas Poster. Ideally B0 format (1000mm × 1414mm or 39.4in × 55.7in)(see Appendix A); Tons of sticky notes (i.e. post-it® notes) of different colors; Flip chart or board markers; Blank papers and pen for note taking; Camera to capture results
Why	To get an initial draft of the business model for SymbolChat
What	Second version of business model canvas (see Appendix D - Figure 13)
Third Contact Point	
When	6 February 2012
Where	University of Tampere and Laurea University of Applied Sciences
Who	Three representatives from University of Tampere and Researcher
How	Online discussions (open-ended interview, canvas refining)
Why	To add more comments from other stakeholder, University of Tampere
What	Third version of business model canvas (see Appendix D - Figure 14)
Fourth Contact Point	
When	7 February 2012
Where	University of Tampere and Laurea University of Applied Sciences
Who	Three representatives from University of Tampere, two from Laurea and Researcher
How	Online discussions (open-ended interview, canvas refining)
Why	To make sure that no more additions or changes are needed to the business model
What	Fourth version of business model canvas (see Appendix D - Figure 15)

The workshop was conducted using a real Canvas which is big enough to cover the wall of the room. As Business Model Canvas is a hands-on tool that fosters understanding, analysis, creativity, and discussion it was printed out on a large surface. This ensures group work and group of people can sketch and discuss on the individual elements. Post-it® notes or board



markers may aid this process. Post-it® notes were used in this case because this sticky note can be added at one place and then moved or even removed.

During the workshop the researcher directly applied the Canvas with its nine building blocks to provide a basic structure for designing the business model. The model was then shared with stakeholders so that stakeholders get a baseline and future discussions can build on. The discussions happened during the workshop session helped to improvise the model step by step towards a desired to-be state. The workshop discontinued when saturation is achieved in the sense that all information is gathered and further interviewing did not contribute with much new information. The filled up canvas was then sent to University of Tampere for validation. They reviewed the canvas and several online discussions were conducted to refine the canvas.

Each discussion led the researcher to take actions to change the model. This process of distilling the model continued till the stakeholders are satisfied with the model. The final business model is thus created, based on the business model draft from the workshop and the results from the online discussions.

#### 6.4 Data analysis

The researcher had prior experience with open-ended interviewing; henceforth the interviewing and transcribing process was done by the researcher. Transcription refers to the process of reproducing spoken words, such as those from an audio-taped interview, into written text (Halcomb & Davidson 2006, 38). Since the data collected were qualitative, qualitative content analysis is used in this study to analyze interview transcripts. As said earlier, open-ended interviews were conducted during workshops and online discussions.

Content analysis is a detailed and systematic examination of the contents of a particular body of material for the purpose of identifying patterns, themes or biases. Content analysis is performed on some forms of human communication which include transcripts of conversations, newspapers, television clips, video recordings of human interactions and bulletin board entries (Leedy & Ormrod 2010, 144). The transcripts served as the primary sources of data for content analysis.

The researcher analyzed the qualitative data using Strauss's (1987) guidelines in *Qualitative Analysis for Social Scientists*. After each interview was transcribed, the transcript was read several times and analyzed into emergent conceptual categories. The focus of the analysis was on data in the form of words, emanating mainly from interviews conducted. These words require processing, which in itself is a form of analysis (Miles & Huberman 1994).

Data reduction, data display and conclusion drawing are the three steps of qualitative data analysis (Miles & Huberman 1994) which was used in this study. The reduction of data is an analysis that organizes the data and allows for final conclusions to be drawn. In this study data from the open-ended interviews, which was conducted during the workshops and online discussions, was reduced through comparing the data with the issues considered and sorting out the important data. In the second step, data display, empirical data about the organization and its services was displayed as per the business model canvas. In the third step, conclusion drawing, the collected data is used for discussing and concluding.

#### 6.5 Research quality - validity, reliability and generalizability

The objective of any research is to establish truthful and accurate findings, yet, the results of any study can only be as good as its measures and therefore it is important to evaluate the goodness of measures. Particular attention should be paid to validity, reliability and generalizability. These three factors ensure the scientific value of the research by asserting that findings are useful and appropriate.

Firstly, *validity* is a concept that measures the truthfulness of research and exists in many different forms (Bryman & Bell 2007). The three most fundamental forms of validity that is discussed in this report are construct, internal and external validity.

*Construct validity* implies that a study actually measures what it is aimed to measure (Bryman & Bell 2007). This study uses business model canvas as a measure to describe the logic of an organization. Since business models themselves can be described in many different ways, a number of actions have been taken to assure the construct validity of the study.

To begin with, the literature review is used to provide a clear definition of what is meant by a business model in this study. This was further clarified by discussing the important issues, which is used as a basis for forming the map of questions. For adding to the validity a close collaboration was also be kept with the case company during the model generation, including contact with respondents to avoid the risk of interpreting them in a wrong way. The filled business model canvas was also be presented to the case organization during the workshops and after that to make sure the facts are presented accurately which in turn ensures the efficacy of the model. Altogether, the construct validity of the study is therefore meant to be high.

*Internal validity* implies that the right people with the right competence are interviewed and that causal relations exist between the measured variables (Bryman & Bell 2007). In this study different sources and organizations staff were included to gather needed information. This is

meant to assure the internal validity, but it is a fact that statistically proven causation is hard to assess regarding business factors and such multifaceted subjects as business models.

Since the scope and limited time of the study limits the amount of possible workshops, this makes it reasonable to discuss whether the sample size gives a representative view of the opinion within the organisation. Due to the sensibility in choosing respondents to achieve a multitude of perspectives this is meant to be the case, but it cannot be excluded that a larger sample size could have lead to somewhat different results. However, during the interview process when the respondents' answers started to become saturated, indicates that no more workshops are needed to get additional insights.

*External validity* means that the research can be applied in a broader perspective in order to generalize the conclusions (Svenning 2003). Bryman and Bell (2007) means that ensuring external validity is made with a thorough description of the object and concept of study. The external validity of this study can be confirmed in an objective manner since many of the results are based on the issues considered which can be applied to similar sized company (small and medium size). It can be assumed that many of the results are valid for other organizations, and henceforth this study is enough to validate such a generalization.

*Reliability* is a concept that describes to what extent the results of a study are repeatable. The reliability is predominantly an issue related to quantitative research, since it is sometimes hard to assess in a qualitative study. Data is collected in interaction with other people in a given point of time, which makes it hard to collect identical data that do not change over time. Christensen, Andersson, Engdahl, & Haglund (2001) therefore argue that the reliability-concept is irrelevant for judging the value of a qualitative analysis. This study is mainly based on qualitative data from interviews, which thereby is meant to render low repeatability. However, since the same type of questions have been posed to many of the different respondents, the probability of other researchers making the same analysis is argued to be high if using a similar method and interview questions.

In this study, most evaluations have been done on a qualitative basis by the researcher. This leads to subjectivity in the evaluations. Furthermore, qualitative data is words rather than numbers that bring both advantages and disadvantages to the reliability of the thesis. Words are descriptive and explaining, but at the same time they could also be ambiguous and difficult to compare objectively.

*Generalizability* is a big concern for researches (Lee & Baskerville 2003). Research findings applicability to other samples is described with this term (Polit & Hungler 1991; Ryan & Bernard 2000). Generalization comprises of 'the usefulness of one set of findings in explaining

other similar situations' (Grbich 1999, 66). This term is 'central to the definition and creation of valid public knowledge' (Metcalf 2005). It is occasionally used with other terms like 'transferability' and 'external validity' (Tashakkori & Teddlie 2003). By its very nature it refers to the external validity of the research and therefore it refers whether or not the work can be applied to other research settings as well.

The study at hand was designed to offer as much generalizability as possible. The issues that are considered are aimed at finding the most important issues that should be addressed by a small and medium sized company with the help of the case company as an example. Because of this reason these findings should be capable of generalization across the entire similar sized organization operating in various fields of business.

## 7 Tailored business model issues

This section deals with the workshop or interview planning process. Building on the review of the business model literature, the workshop or interview focuses on uncovering the factors that need to be addressed to construct a business model. In this regard, the workshop or interview plan collects the relevant questions for building a model for the case company operating in service industry and filters them into a manageable set that takes into account most issues a company model may depend on.

The business model generation is not an easy task and there are multiple variables that have to be taken into account. The different variables from the literary sources are grouped into nine building block elements of the Osterwalder's model. Table 8 presents the elements of the Osterwalder's business model listed next to the variables of each individual element identified by Osterwalder and Pigneur (2009).

Table 8: Variables associated to the business model elements  
(Osterwalder & Pigneur 2009)

Pillar	Component	Variables	Sample Values
Product	Value Proposition (VP)	Elements of value	Qualitative (e.g. design, customer experience) or Quantitative (e.g. price, speed, service)
		Fulfilled customer needs	Non-exhaustive (e.g. low price, convenience, customization)
		Product types	Non-exhaustive (e.g. software, hardware)
		Degree of differentiation	Highly differentiated (multiple products to multiple destinations) / Differentiated / Specialized (specific products to specific destinations)

Customer Interface	Customer Segments (CS)	Segment	Domestic / Europe / Rest of World / Families with children / Elderly people / Working couples
		Customer groups	Geographic (e.g. region) / Socio-demographic (e.g. income) / Psychographic (e.g. service motivation) / Behavioral (e.g. habitual reaction)
	Distribution Channel (CH)	Type	Direct (e.g. sales force, website) / Indirect (e.g. through intermediaries / own stores / partner stores / wholesaler)
		Functions	Awareness / Evaluation / Purchase / Delivery / After sales
	Customer Relationships (CR)	Categories	Personal assistance / Dedicated personal assistance / Self service / Automated services / Communities / Co-creation
		Motivation	Customer retention / Customer acquisition / Up selling
Infrastructure Management	Key Activities (KA)	Categories	Production Problem solving Platform/network related Marketing and Sales process Support delivery process
		Key Resources (KR)	Categories
	Types		Tangibles, Intangibles and People-based skills (human)
	Key Partners (KP)	Categories	Strategic alliances / Competition / Joint ventures / Buyer-supplier
		Reasoning	Optimization and economies of scale, reduction of risk and uncertainty and acquisition of resources.
	Financial Aspects	Cost structure (C\$)	Characteristics
Type			Investment cost / operational cost
Revenue Streams (R\$)		Type	One-time payment / Recurring payment
		Generation	Asset sale / Usage fee / Subscription fee / Lending renting leasing / Licensing / Brokerage fee / Advertising

The components or elements of building a business model create a basis for the issues that should be discussed in the workshops or interviews to help build the business model for the case company. Among the several variables, as seen in Table 8, only one from each of the nine building block elements is selected as the main interview question. The main interview question here means that first question asked for each of the nine building blocks. The reason behind this kind of selection is that the interviewer needs a main question which can open up answers to other questions also. In this regard the question is selected by looking at the importance of the associated variables and also the ones that are more relevant to the company. This kind of selection varies with interviewer and also with the case company and there by the guideline questions also vary. The grids that are marked in blue colour are the variables leading to the primary questions and they are selected to form the sub-questions which give a clear and accurate picture of the business model. The sub-questions may contain questions related to other variables which are not considered for selecting the main questions. The reason behind this is that the interviewer may need to ascertain some answers or clarify some of the responses with respect to the main question. This is accomplished by asking some of the sub-questions formulated with the help of other variables. However, it is not mandatory to ask those sub-questions. These questions were specifically selected to cover most aspects of the business field that surround a small and medium sized company. Considering the variables from Table 8, the following guideline questions (Table 9) are formed for the workshops.

Table 9: Guideline questions  
(Business model generation 2012)

Building Blocks	Main Question	Sub-question
Value Proposition	What value is delivered to the customer?	Which customer needs are satisfied? _____ What is the actual service done? _____ What is needed to meet or exceed customer expectations? _____ What bundles of products and services are offered to each customer segment?
Customer Segments	Who is the target customer?	Is value created only for intellectually disabled people? _____ People with what degree of ID? _____ Is there any group of intellectually disabled

		people exempted from this service?
Distribution Channel	How the customer segments are reached?	<p>How to raise awareness about the company's products and services?</p> <hr/> <p>How to help customers evaluate the service?</p> <hr/> <p>How to purchase the service?</p> <hr/> <p>How the service is delivered?</p> <hr/> <p>How to provide post-purchase customer support?</p>
Customer Relationships	What kind of relation company wants with the customers?	What motivation does the company have to maintain the relationships?
Key Activities	What are the key processes needed?	Which of these activities can/should be outsourced?
Key Resources	What are the key resources needed?	What is the required skill level of employees?
Key Partners	Who are the key partners and key suppliers?	<p>Which key resources are acquired from partners?</p> <hr/> <p>Which key activities do partners perform?</p>
Cost structure	What are the most important costs inherent in the business model?	<p>Which key resources are most expensive?</p> <hr/> <p>Which key activities are most expensive?</p> <hr/> <p>How much does it cost to motivate the employees?</p>
Revenue Streams	How are customers paying?	<p>For what value are the customers really willing to pay?</p> <hr/> <p>What are the payment-terms customers agree on?</p> <hr/> <p>How many days of sales in accounts receivable?</p> <hr/> <p>What is the pricing model?</p>

These guideline questions were used as notes for the researcher to guide the workshops. The answers to these questions reveal the business model that the company follows in its operations. The researcher believes that if answers to these questions do not contradict each other then the company business model is sound and viable.

### 7.1 Customer proposition

The purpose of the company is condensed to four simple questions related to customer needs and actual service of the company. These are listed in the section for Value Proposition. It is important that an organization always remember that the heart of the business model is the customer. Three questions given for Customer Segments identify the company's target customers. The Channel is the way the organization uses to reach and communicate with its customers. The questions noted for the third building block, Distribution Channel, looks at the factors that increase a positive customer experience. The Customer Relationships range from personal assistance to automated systems, and they greatly influence the general customer experience. The questions that accompany this building block describe all the relationships that the organization establishes with the specific customer segments. Answering this set of questions will allow company to create the value proposition that takes to account the target customers, value offered to them, relationship with customers and the communication between customers and company.

### 7.2 Resourcing, core processes, partnerships and earning logic

The questions for key resources building block explains how resources are used to create and offer the value proposition, and to reach the right markets, what resources are needed to maintain relationships with customers, and eventually earn revenue. Typical examples of key resources are: facilities, vehicles, machines, distribution network, IT, logistics, infrastructure, brands, proprietary knowledge, patents and copyrights, partnerships, customer database, intellectual property, human resources and financing. The key activities reflect those activities that are required to create and offer the value proposition, reach markets, maintain customer relationships, and earn revenues. Typical questions pointed for the building block key partners describe the network of suppliers and partnerships required to make the company's business model work. Answering this set of questions will allow company to achieve the other building blocks, especially the value proposition, the channels, the customer relationships and the revenue streams.

The questions for revenue streams represent all the cash that is generated by the different customer segments. The cost structure building block describes all the costs that the



organization incurs when operating the business model. Answering this set of questions will allow company to ensure the financial aspects of the business and to know if it is possible to gather enough funds from the market and more importantly how it is going to do it.

## 8 Application of the business model to case company

This section presents the findings from the workshop, open-ended interviews and online discussions held during the early months of 2012 with the stakeholders of the case company. The collected information during the sessions characterizes how the company's business model works and how the company competes with in the industry. These discussions were based on by the ideas from the business model literature review presented in section 5.2 and the guideline questions from section 7. The findings are given here in the order of the building blocks of the business model canvas. The following sub-section analyzes the current state of the company by applying the guideline questions and business model canvas.

### 8.1 Product (Value proposition)

In this electronic era, ICT lies at the heart of most of the activities that constitutes 'social inclusion'. In order to serve the needs of a wide range of persons with communication and/or language impairments the case company concentrates in providing alternative communication, that is, communication using methods other than those which are ordinary as a substitute for the ordinary methods (alternative). As current systems are too complicated for the disabled to use the company provide support for such users to communicate with their choice of conversation partner by developing the concept of symbols as a substitution for one or more words, providing a graphical method of expression for persons with intellectual or language difficulties. This value is developed especially for illiterate or semi-illiterate people either due to learning or cognitive disabilities.

To be more specific, the case company develops an online symbol-based chatting experience by means of a simple web-based application. The application is named as SymbolChat, a software platform that supports the creation of multimodal communication applications utilizing picture-based instant messaging. Its user interface is shown in Figure 6. While the primary output modality is the symbols; text and speech outputs are also supported. By means of this tool persons with intellectual disabilities and/or a foreigner to a particular language benefits from technological advancements, especially the World Wide Web, social media and Internet-mediated communication services. Intellectually disabled people are non-technically skilled people and they may even lack writing skills. So current solution empowers them to communicate with others and thereby improve their social interaction. In the other

perspective India has hundreds of active dialects in use. Current solution takes away the language barrier and enables people who do not speak same languages to communicate.

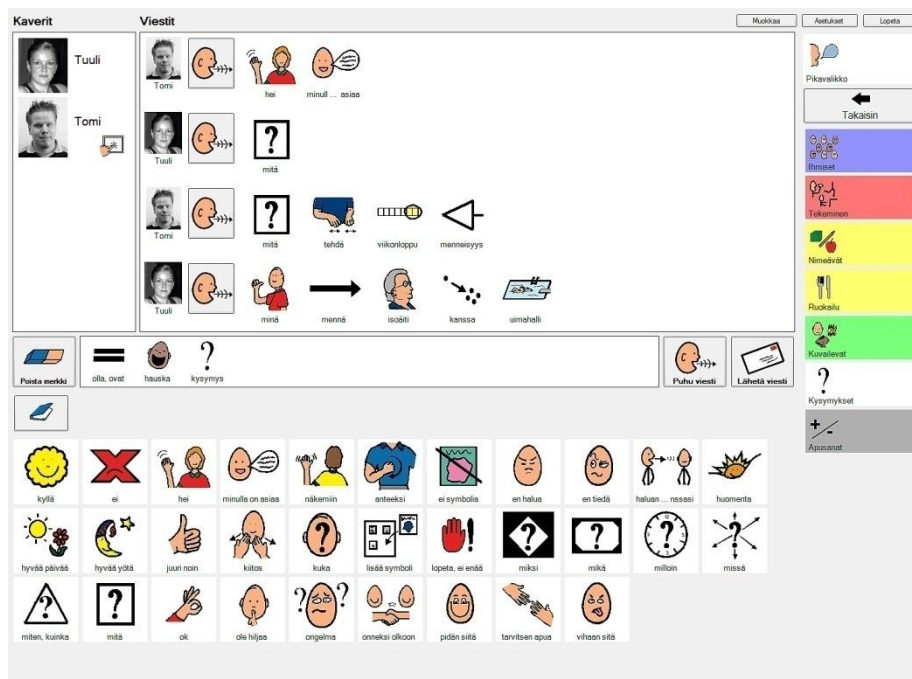


Figure 6: The user interface of SymbolChat application (Keskinen et al. 2012)

This SymbolChat application is meant to solve some of the main issues like social isolation and communication problems. It has a flexible and lightweight construction of different communication scenarios. The main strength of the system is its less experience or training required to use the service. Another value adding benefit is end users and their support personnel can customize the input and output features of the application based on their individual needs and abilities. The solution is simple and easy to use, helps to build social networks, can be used for entertainment and can have fun, only one touch operation, personal customization possibility is also available.

## 8.2 Customer interface

Customers are the heart of the organization because they are the ones who brings the need for a particular product and/or service. The element '*customer segments*' refers to the segment of customers that the company chooses to target for its value offering. The service is targeted to two countries: Finland and India. To build an effective business model, various set of customers can be segmented based on the different needs and attributes to ensure appropriate implementation of corporate strategy that meets the characteristics of selected

group of clients. *Demographic segmentation* (see Appendix A) of the case company is given below.

The marketing method adopted by the case company differs with geographical regions i.e. in Finland the company concentrates to *niche market* (see Appendix A); however in India it is *mass market* (see Appendix A). To understand this clearly, it is better to understand the difference of these two types.

A mass marketing strategy is about communicating with the largest possible audience. It is about throwing a net into the ocean and hoping to get a lot of the right fish. On the opposite end, niche marketing focuses on a small group of people that have interests which align with a particular product or service. Marketing to a niche is like fly fishing where you carefully select the lure and the location and then patiently draw in the fish you want to catch. Both methods will get you fish, but, depending on the business strategy, one might be a better choice for the business. The case company also did a market research and found out that two different strategies are needed to dig the gold mine from two different countries. The following paragraph explains how they selected this strategy and how they segmented the market.

In Finland, more than 50,000 people have been diagnosed as having intellectual disability (Kankkunen P., Jänis P. & Vehviläinen-Julkunen K. 2010). Additionally, immigrants who don't know Finnish/Swedish are also increasing in Finland day-by-day. So the need for designing better systems and services for intellectually disabled people/immigrants increases due to their desire to remain independent in their living environment. Considering this increasing demand for a right solution for them to be independent the case company found out a potential craving for this communication platform in Finland and subsequently they decided to market this tool to a niche market.

On contrary to this, Indian market cannot be kept niche for such a functionally rich communication platform. In order to mingle with foreigners India is demanding for this kind of communication tool which has the power to eradicate the existing language barrier. Henceforth, the case company planned to mass market this tool in India.

More specifically, for Finns this product is targeted to intellectually disabled people with mild and moderate degree of disability, parents or caretakers of intellectually disabled people, service providers or ICT-counselors for intellectually disabled people. Indians who could be targeted for this product can be categorized as: (1) Intellectually disabled people with mild and moderate degree of disability, People who are deaf and/or dumb: They are group that requires special needs and would benefit a lot with this service. (2) Friends, Lovers: The word

'Lover' here needs an explanation because this word is not common outside India. In India these two words are treated differently. According to traditional Indian culture friends mean friendship among same sex. However, lovers mean friendship among different sex. In effect, everyone welcomes the word friend and the word lover is treated with bad eyes. Now-a-days it is quite common to have a friend/lover speaking some foreign languages, especially in India. Thus this tool is very helpful for them to build a strong relationship. (3) Politicians: As said earlier India has a lot of states and there are a lot of political parties and members from each state leading the country. To be honest half of the party members are said to be illiterate. Many politicians have even criminal cases pending against them and serious "mafias" (the word is used in India) that are involved in smuggling, illicit drugs etc. controls politicians (Oldenburg, P. 2007). This is because of the illiteracy of politicians and also in India the ability to be elected takes precedence over ability to govern. Seattle Times, a newspaper, reported that in an election conducted during 1996 the BJP (Bharatiya Janata Party - one of the major political parties in India) slate included a 52-year-old woman who sells coconuts on the streets of Madras (an Indian state) and an actor who played the Hindu god Krishna in a popular television series (Dahlburg, J 1996). These all reveals the fact that politicians in India are not that much educated and they may even lack the knowledge of other languages other than their native language. To deal with this situation it is very useful to utilize the functionalities of this application.

In short, in Finland it serves intellectually disabled people. On the other hand in India it is used by people who want to communicate with others who don't have a common language to converse.

The third block '*distribution channel*' lists the ways to reach the customer segments. The company is reaching its customers through various channels. It varies with geographical regions. In Finland they employ partner store and interactive screen provider (current prototype of the tool is based on touch-screens as a means of inputting the symbols). The partner store Tikoteekki, the Communication and Technology Centre, promotes communication for people with complex communication needs and the use of computer among people with disabilities. Founded in 1995, Tikoteekki offers assessment and introduction of low- and high technological communication aids, methods and strategies to persons with communication difficulties and their close communication partners. The centre gathers and disseminates information on AAC (Augmentative and Alternative Communication; see Appendix A) and on related cutting-edge technological communication (AT - Assistive Technology; see Appendix A) solutions.

However in India, they employ app store or online store from where the application could be subscribed and also mobile service provider. The App Store/Online Store is a digital

application distribution platform. The service allows users to browse and download applications from the Store. Depending on the application, downloads are available either for free (have to find revenue from other sources) or at a cost. Because mobile applications are subscribed to, rather than purchased, this application can be availed to market through mobile service provider also.

The fourth segment '*customer relationships*' deals with the kind of relation company wants with the customers. In order to optimize operations and reduce risks of a business model, organizations usually cultivate buyer-supplier relationships so they can focus on their core activity. To ensure the survival and success of any business, companies must identify the type of relationship they want to create with their customer segments. The company has established and maintained four relationship systems with its customer segments. They are listed in Table 10.

Table 10: Customer relationship systems

Finns	Personal assistance: the most intimate and hands on assistance provided at the direction of a disabled person to enable independence. Caregivers assist or help in service consumption.
	Third-party assistance: Caregivers may be educated by means of training or help manuals or help links.
	Co-creation: The application could be customized as per the preference of the end-user.
Indians	Self-service: Customers can download the application to their mobile and they can use it without any help.

All of these systems are based on human interaction. The reason behind this is the case company's value propositions are based on high levels of customer satisfaction and trust. To ensure the business success it is important to establish a strong bond with company's customer segments and so the relationships shown in Table 10 need to be maintained.

### 8.3 Infrastructure management

The component '*key activities*' lists the activities to create and deliver value. The user interface of this application as shown in section 8.1 (Figure 6) has three main segments: (1) The message history view: The top left part of the application shows the messages sent or received. (2) The symbol input view: The bottom left part is dedicated for composing, previewing and sending the messages. (3) The symbol category view: This view is sectioned at

the right most part of the application and lists the available symbol categories. A list of actors is shown to the extreme left of the view. Also if the Text-to-Speech functionality is enabled then each message is read out loud. User can also replay the message depending to his/her wishes.

In order to deliver the above functionalities it is very important to develop nice software. Hence one of the main activities is software development. Also this communication tool serves as a service to intellectually disabled people or people who face linguistic problems. Hence it is very essential to develop the service and also to evaluate the service. So service development and service testing/evaluation come as the next key activity. Though these two steps are considered vital, it is not the closing stage of key activities, but just beginning.

The above three activities are considered the initial stages of the service development. Next stage is to grab the market share. For fulfilling this aim it is necessary to undertake commercialization, maintenance, marketing & sales of the product. In this regard commercialization, maintenance, marketing & sales of the product are the other key activities considered. Lingsoft provides full-service language management. Considering this, it is critical for the application to integrate with Lingsoft. Thus integration work with Lingsoft is another key activity involved.

Last, but not least, symbols are the center of attraction of this application. Moreover, it is fascinating to use approximately 2,100 symbols within the chat system. What is more with this ample amount of symbol set is to acquire the authorization to use the symbols. Accordingly, symbol licensing is the last key activity included.

The next element '*key resources*' lists the in-house capabilities to execute the value configuration. They are considered an asset to a company, which are needed in order to sustain and support the business. These resources could be human, financial, physical and intellectual. At present, the reference implementation of the customizable graphical application that allows sending short symbol-based messages in real time includes the server software. The server side software includes the speech recognition software, Text-to-Speech (TTS) conversion software (unless it is done on client) and chat server. Accordingly client side software includes the SymbolChat application by itself and the TTS conversion software as mentioned above. Client-server architecture and .NET Framework is adopted in this application platform.

Co-ordination of the communication between the client applications is done by the central messaging service that also manages interfaces to other communication services. The central messaging service is responsible for distributing the messages sent by users to their

recipients, maintaining users' activity status sessions and login information. The interaction to the system, as per the current prototype, is based on touch-screen input and symbol and text-to-speech output using speech synthesis technology, but it also supports mouse and keyboard interaction. Henceforth the application consists of Software, Hardware, Server, Symbol library and Touch-screen or normal desktop or mobile.

The component '*key partners*' lists the capabilities acquired through the firm's partnership network to execute the value configuration. The development of this interactive, innovative and functionally relevant software that are designed to both challenge and positively affect the lives and experiences of people who have intellectual disabilities is very challenging. However, experts from University of Tampere, Laurea University of Applied Sciences and Lingsoft handled the situation by taking the development tasks on their head.

To make things easier, service design experts from Laurea University of Applied Sciences and University of Tampere joined their hands in this adventure trip. With their specialist opinions and professional design of the service the marathon reached safely in the hands of the customers; leaving happy faces.

However the application demands to have some kind of a basic set of symbols to start with, though the software is fully customizable at the end. In order to select those symbols professionals from this field was essential. Henceforth AAC professionals like Rinnekoti Foundation took the role in Finland. In India this role is laid upon some linguistics and/or cultural experts. In short, key partners and suppliers are Lingsoft for software development, University of Tampere for software development and service designing, Laurea University of Applied Sciences is also for software development and service designing, Rinnekoti Foundation as symbol selection expert, E-store solution provider, Hardware suppliers.

#### 8.4 Financial aspects

The block '*cost structure*' reflects information about all the costs company creates in generation, marketing and delivery of the value it brings to the customers. Software development is not only the writing and maintaining of source code, but it may also include research, prototyping, modification, maintenance or any other activities that result in software products. So, software development is one of the cost consuming processes. The solution requires a tangible component as the user interface like a touch screen provider or mobile. Not only this, many other hardware is required for this platform to run safely. Thus hardware acquisition is another entity that consumes cost. As mentioned earlier the current application supports roughly 2000 symbols and so it is very important to have these symbols

licensed. In brief, the most important costs are for software development, hardware acquisition, licensing, advertising, marketing, sales and service delivery.

If the customers are the heart of the business, revenue streams are the arteries of the business. This financial perspective element '*revenue streams*' describes the way a company makes money through a variety of revenue flows (Osterwalder 2004, 43). The case company can generate income by levying a fixed charge for using the application. They can charge this amount as software subscription charge or software usage fee. The same can be applied for mobile download also in the form of mobile application download or application usage charge. To be brief, the revenue comes mainly as software subscription or usage fees and mobile application download or usage charge. In addition to this if more people are willing to purchase the service then prices can be adjusted accordingly. The company is also planning to provide this software as an open source or as free of cost. In this case company needs to find other revenue streams like revenue from educating services and/or training and/or support services to cope up the situation.

#### 8.5 The resulting canvas

In this sub-section the results from the individual building blocks presented in previous sub-sections are condensed in order to describe the business model of the case company. The model is then presented to get customer feedback and analyzed for identifying the improvement areas. The resulting business model painted with the help of the canvas is shown in Figure 7.



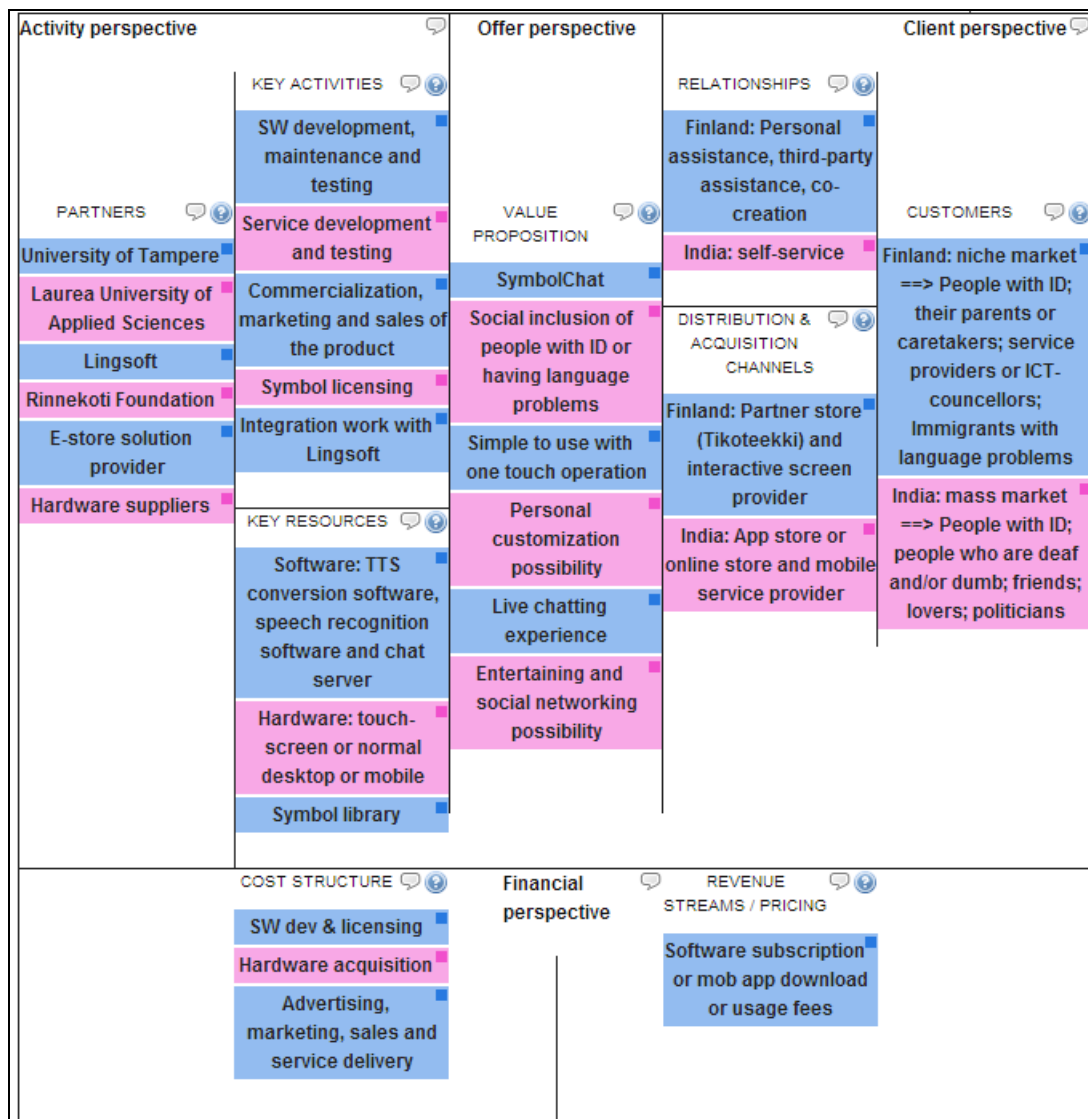


Figure 7: The Business Model Canvas of SymbolChat for case company

The sketch presented as Figure 7 was created with the help of an interesting software tool named BM|DESIGN|ER which is a prototype tool dedicated for designing/sketching business models. This was the first software tool based on the business model canvas. It is developed by Boris Fritscher as part of his master's thesis. It has close resemblance to the real world sticky note experience. Its layer feature allows us to add different colors so that it mimics the sticky note features. The model given in Figure 7 uses two different colors to distinguish the alternate layers. The blue layer is the default one and usually represents the first row/odd rows of any building block. However, the even rows are colored in pink. Elements in white background are the ones provided by the tool itself. This includes the border lines, the separation lines, the name of the building blocks, the name of different perspectives or pillars, the question mark sign to show the questions associated with the element and the

comment sign to provide annotations that can behave like to-do tasks. The author selected this tool to sketch the canvas is because of its close analogy to sticky notes on a wall.

## 9 Previous study

In this section, the results of the previous study conducted with intellectually disabled people in Finland regarding the usability and functionality of the application are presented. This section is based on two publications related to SymbolChat by Keskinen et al. (2012). The following paragraph summarizes the field study conducted as part of the SymbolChat application.

Prior to this thesis work, a customer feedback study was conducted with intellectually disabled people for this SymbolChat application in Finland. The study was conducted to collect constructive feedback from the customers and thereby to identify further development areas to the application. A period of six weeks from September to October 2010 was spent for this field study and it was conducted at the premises of Rinnekoti Foundation, a foundation that produces healthcare and social services mainly for intellectually disabled people.

The study was carried out with nine participants, aged 14 to 37 years. Out of these nine participants eight were intellectually disabled people. Three participants were minors and six were adults and they had either a mild or a moderate mental retardation. Nine members of the support personnel from the Rinnekoti Foundation also took part in the study as assistants to the participants. The participants were not having any previous experience related to the application. Four groups were formed with two to three participants in each group evaluating the application in such a way that each group is allocated one week time to use the system.

Three evaluation sessions were conducted during each week, lasting approximately 45 to 60 minutes per session. The processes carried out during the three sessions were: (1) Session 1: Application introduction (2) Session 2: Interviewing the participants using pre-structured questions, expectation questionnaire filled up by support persons and participant observation during semi-structured discussion. (3) Session 3: Participant observation and interview and subjective feedback forms collected from support persons. The field study resulted in identifying the strengths and pitfalls of the application which are discussed below. Below part also explains on how the problems can be rectified in the further versions of the application.

*Amount of Symbols in the application:* The default set of approximately 2,100 symbols poses difficulty in practical usage. The message drafting time was high because of the several categories of symbols and the lack of knowledge on the characteristics of the symbol set.

Solution for this problem was to provide a functionality to modify the symbol set according to the user preferences.

*Supports for Users' Own Symbols:* Initially users find it a little tricky to handle the application and needed assistance to use the system. However, when they become more familiar to the application then they can add completely new symbols into the existing set. Henceforth users could customize the application to minimize the level of complexity especially with symbols.

*Rehearsing Turn-taking:* Active participation was lacking among the chat users because they were focused more towards their-own messages and also they had to wait for a long time to get answers from other parties. To tackle these problem two different solutions were devised: inclusion of functionality to guide and control the flow of discussion and by making use of the message generator.

*Maintaining Users' Motivation:* In order to motivate participants to actively participate in the discussions it is essential to rehearse the learned functionalities and also to add new functionalities slowly. Additionally audio-visual indicators can be used to activate users.

## 10 Reflections from India

This section detail the work carried out as part of this study and is based on the recent interviews with Indian customers, company's second target group. The research detailed in section 9 was conducted with Finnish people and so it became essential to conduct a study in India also to get reflections on the company's SymbolChat application. The reason behind conducting a field study in India instead of conducting in Finland is based on the fact that the case company already conducted a feedback collection with Finnish people which is presented in section 9. In this respect the researcher believes that the case company is lacking comments from Indians and so decided to collect remarks from India. The main purpose of the study is to identify the improvement areas so that it will enhance the productivity of the service which in turn will increase the company's turnover. This study also identifies factors that influence the effectiveness of symbols beyond literacy and that are essential to the use of symbols as a "communicative event". In addition to this, several ways to advance the market possibilities in India are also investigated.

*Purpose of the Study:* The main objective of this study is to get end user opinion on the application. Therefore, a field study was conducted by means of open-ended interviews (explained in section 6.2), both planned and spontaneous, with target group. The question formula used when interviewing users can be found in section 10.1. During the interviews, the answers were written down by the author.

Sample and data collection: The study is conducted in the three cities of India namely, Mumbai, Kanpur and Kolenchery. These three cities help to give a clear picture of the in-country variances with respect to the usage of ICT. Researcher chose these cities for a number of reasons. Firstly, it was appropriate to do the study in these three cities as researcher has family and relatives with whom author could stay during the course of this study and who assists the researcher to identify interviewees. Secondly, these cities are familiar for the author and so living and do interviews here would be easy because author knows the cultural differences of these cities. For instance, Mumbai is known for its night life; however in Kanpur night life is not that good. In contrast to this night life in Kolenchery is almost nil. The third aspect was the dissimilarity in the urban environment of these three cities. Background information about India and a description of the three cities dissimilarity in their urban ecology and socio-cultural environment was given in section 4.

The sample consisted of 25 adults chosen randomly during June, 2012. Much of the oral information gathering consists of non-organized interviewing, and proceeds rather in a discussing manner. To recruit participants for qualitative interviews, a snowball sampling technique was used. The people chosen for these talks are basically anyone with some kind of relation or insight of the topic. The researcher personally enquired the adults regarding their willingness to participate in the study and some of the study participants helped to recruit their friends and others who wish to participate. Participants were also selected through researcher's friends and family, especially in Kanpur and Kolenchery. This kind of chain-to-chain selection process sequenced through networks can be matched to a rolling snowball. Out of these 25 adults, eight were from Mumbai, another seven from Kanpur and the rest were from Kolenchery.

The demographic characteristics of the sample are based on gender, age, education, as well as on the knowledge on ICT and related topics. Most of them were under 50 years old and included both men and women. Participants were interviewed at different times to understand their preferences and priorities while using information and communication technologies like a mobile or television. The next section describes the questionnaire used in Mumbai, Kanpur and Kolenchery.

#### 10.1 Interview questionnaire

The following questions were used in the interviews with people. In case the interviewee had some relevant knowledge or expertise, more questions on the subject were asked.

**ICT Usage**

- Do you own a mobile or any other information and communication technologies?
- Does anyone in your family have any of the above mentioned devices?
- Do you have access to a computer?

**Yes:**

- In what purpose do you use these technologies?
- How often do you use Internet and mobile or other communication devices?
- What features you like the most?
- In what ways is it good?
- In what ways is it bad?
- In what language you prefer to use?
- What you prefer to get in such a device to avoid language barrier?
- Did you any time use symbols for communication? What is your comment on this symbol based communication?

**No:**

- How do you communicate with someone speaking another language?
- Does it work well?
- In what purpose do you communicate?
- Do you want a device that avoids this language barrier?
- What you prefer to get in such a device to avoid language barrier?
- Do you have any other comments or suggestions to keep in mind while designing such a device?
- What is your view on symbol based communication?
- Do you have any previous experience on symbols and communication using symbols?
- In your view point what all you suggest while designing symbols for communication?

**10.2 Design of interview process**

The study was created in English, at first, and then was translated in Malayalam and Hindi with the help of a translator in India who was familiar with the local language of the participants. The English questionnaire used for the study in Mumbai is presented in section 10.1. The questionnaire in Hindi and Malayalam that was used for the study in Kanpur and Kolenchery respectively is presented in Appendix E and F.

The questionnaire is designed mainly to get an understanding of user's opinion of their likes and dislikes of a device or technology which they can use to avoid the language barrier. The questions in general consisted of checking the target groups experience with any ICT devices or technologies and depending on this several other questions were asked to collect an understanding of what they prefer to have in such a device. Questions related to symbols and

communication using symbols were also put forth to find out more improvement areas. In order to help the participants to get an idea of the application, they were shown the user interface of SymbolChat application in paper as given in Figure 6.

In Mumbai, open - air setting is used for the interviews like cafes, super markets and malls where the researcher could meet a prospective interviewee. In Kanpur, the interviews were done at a coaching institute and at the residence of some of the interviewees. In Kerala, the interviews were carried out at the residence of the interviewees. In Mumbai, English was the chosen language among respondents, whereas in Kanpur, everyone selected Hindi as their preferred language except for a few. However, in Kolenchery everyone wants to be interviewed in their own native language i.e. Malayalam. Interviews took more than an hour and main points were noted in diary by the author. The researcher by herself translated the data collected to English.

### 10.3 Results of interview with Indian customers

This sub-section deals with the results of the questionnaire presented in section 10.1. This sub-section presents the analysis of the data collected and is partitioned based on the main theme of the questions. Each sub-section describes how participants responded for different questions posed to them in all of the cities. In this study, the author explored a variety of variables to gain insight into the improvement areas of SymbolChat application among Indian customers.

#### 10.3.1 Familiarity of ICT among Indians

To facilitate the process of collecting feedback on SymbolChat application, it is very essential to understand the market as a whole. The reason behind this is, the researcher doesn't have any sample or prototype of the application when this interview took place and so if the market is not aware of any ICT-based services then there is no point in collecting comments because SymbolChat application is an ICT-based service and therefore visualizing such a service and commenting on it pre-requires some experiences on ICT based services. To better understand the Indians level of expertise in ICT related devices it is important to delve into their experience with ICT in their living environment. In order to fulfill this aim and to evaluate the Indian market three questions were asked with interviewees from three different regions. These questions were designed to gain an understanding regarding prior experiences on ICT based services. It was assumed that past experiences on ICT based services may have an impact on the use of SymbolChat application.

First question deals with personal ownership of any of ICT related devices. This question was asked because personal possession of any of these ICT related devices indicates that they may have very good knowledge on that particular device and so they could comment on this application under study in a better way by associating this with any other application in that ICT device. In response to the first question, seven devices familiar for the interviewees were identified and are listed in Table 11 with the percentage of people supporting the devices from the three regions.

Table 11: Response for first question

Do you own a mobile or any other information and communication technologies?			
Devices	Mumbai (%)	Kanpur (%)	Kolenchery (%)
Computer	98	91	55
Digital television	92	78	43
Mobile phone	99	89	61
Telephone	61	82	80
Radio	44	60	86
MP3 Player	93	74	41
iPad	93	68	35

The data reveals that there were region-wide differences exists regarding the usage of different ICT devices by the participants. For example, comparing with the participants in Mumbai (97%) and Kanpur (91%), a lesser percentage of respondents in Kolenchery (55%) personally own a computer. Similarly, as opposed to 99% of the participants in Mumbai and 89% of the participants in Kanpur, only 61% of the participants in Kolenchery personally own a mobile phone. Contrastingly, almost all 86% of respondents in Kolenchery personally own a radio, compared to 44% in Mumbai and 60% in Kanpur.

Overall, the numbers indicate that most of the participants in these three cities had personal ownership of some of the ICT related devices. However, a larger percentage of respondents in Mumbai and Kanpur owned latest ICT devices like an iPad for personal use as compared to those in Kolenchery. The fact that figures from Kolenchery shows the lowest for most of the latest devices and technologies may explain the technological development pace of that region.

The second question (Does anyone in your family have any of the above mentioned devices?) is meant to assure that the participants had prior experience with some of the devices. The question assumes that if some of the participants family members or relatives owned those devices then there are chances that the participant can correlate the service with the current

service associated with the device. Surprisingly, the results showed almost identical to the results of the first question. That is, family members or relatives of the participants from Mumbai and Kanpur owned devices like computer, mobile phones, iPad etc. compared to those from Kolenchery. However, reverse was the case with radio and telephones. This once more emphasizes that Kolenchery is far behind in technological developments.

The third question makes sure that participants are aware of information and communication technology, especially internet and distant communication. This question finds out participants different ways of accessing this communication facility and in turn shows their proximity for SymbolChat usage. This question presumes that if participants' accessibility to SymbolChat is near then there are high chances that they use this application generously. Table 12 shows the responses to this question from three states.

Table 12: Response for third question

Do you have access to a computer?			
Ways to access	Mumbai (%)	Kanpur (%)	Kolenchery (%)
Owned personally	98	91	55
CyberCafe	36	48	86
Neighbourhood	25	35	38
Relatives	93	76	48
Friends	89	79	47
Offices/Education institutions	95	93	59

The result given in Table 12 shows that most of the respondents in Kolenchery lack internet access at home and rarely used internet from others except from CyberCafe. On contrary to this finding respondents from Mumbai and Kanpur accessed internet from all means except CyberCafe and from Neighbourhood. On the whole, almost all of the interviewees had accessibility to computer and internet and this shows a high market probability for the SymbolChat application.

One participant from Kolenchery shared a reflection that presents a telling portrait of his past experience. He said, *"I don't know how to use computer or any of the computing systems. Here it is a bit costly to study those technologies. Moreover, I have a number of internet café's at my place who can do computer related stuff's for me. So I don't feel that it is important to learn those. However, if I need to use it independently then I definitely need some kind of assistance."* These words as well as similar comments from other participants confirm that training is needed for people in Kolenchery.



To sum up, most of the adults from Mumbai had previous experience with information and communication technologies. They by themselves owned mobile phones and their families were also quite familiar with at least mobiles, computer and internet. However, participants from Kanpur were mixed such that people who live in the suburbs of Kanpur had very few exposures to these technologies and those from towns had at least used mobiles and computer. Similarly, interviewees from Kolenchery had a little knowledge on these ICT and modern devices like mobile and computer and thereby show the importance of training for them. In general, these three questions give a “rough indication” of participants ICT capability. Mumbai can be put as having ‘Advanced’ level of capability. However, Kanpur claimed to be at ‘Intermediate’ level and Kolenchery at ‘Beginner’ level. This reveals the possibility that SymbolChat can hit Mumbai and Kanpur market though Kolenchery needs some assistance in order to bring success.

### 10.3.2 Suggestions from experienced participants

This sub-section includes opinions collected from participants who had prior experience with ICT and related devices/technologies. This sub-section is composed from responses of eight questions. As a continuation of the section 10.3.1, first question of this sub-section is the fourth question in the questionnaire. The following paragraphs analyses these eight questions.

The fourth (In what purpose do you use these technologies?) and fifth question (How often do you use Internet and mobile or other communication devices?) in the questionnaire deals with the purpose and frequency of using these devices/technologies. These questions check the SymbolChat’s market possibility among Indians. It assumes that if participants use these devices for communication purposes in a regular basis, then the chances of success for SymbolChat in Indian market is high.

On analysis of the interview results shows that respondents from Mumbai uses these devices regularly. They uses mainly computer and mobile phones as a means of information exchange and also to communicate with their friends or relatives who are far from their place of living. Kanpur also shows similar results though they uses these devices whenever need comes. On contrary participants from Kolenchery reveals that mobile phones and computer are not popular in their place and so they uses them very rarely. The network coverage in their place is so bad and internet connection speed is also very low which makes it hard to benefit from these technologies. But if some urgency comes then they avail this service at any coast. This result indicate that SymbolChat application can make its feet over Mumbai and Kanpur, but in Kolenchery it has to find some solution to tackle the network coverage issue and low internet speed problem.

Next three questions (What features you like the most?; In what ways is it good?; In what ways is it bad?) were meant to check the people preferences related to the functionality of these devices or technologies. These questions assume that if participants are satisfied with the supported functionalities then it shows their willingness and openness to accept the globalization changes. This in turn ensures whether SymbolChat needs any localization changes.

The responses tells that participants from Mumbai stresses more on its benefit especially the accessibility to appropriate and up to date information and resources, though they are aware of the detriments. They accepted the fact that careful use of these technologies can benefit mankind a lot in long run. Similarly, respondents from Kanpur also showed interest and motivation on the usage of such device, though they limit their use in fear of the pitfalls of such technologies like password phishing or information leak. On contrary, participants from Kolenchery were so threatened to use these devices because of their ignorance on such technological advances and also of their illiteracy. They had very conservative thinking which also prevents them to accept such technologies. This indicates that people from Mumbai and Kanpur doesn't need much changes to the SymbolChat application, however, it is essential to consider Keralities traditional thinking when designing symbols for this application.

Other three questions (In what language you prefer to use?, What you prefer to get in such a device to avoid language barrier?, Did you any time use symbols for communication? What is your comment on this symbol based communication?) were designed to verify the participants language preferences and their priority for symbol based communication. Shockingly, almost all participants from three regions agree that they prefer to use their own native language instead of English. Everyone was overwhelmed to have a symbol based chat application to avoid language barrier. Moreover they were anxiously waiting for this system as they consider this as an essential thing in order to communicate with foreigners. Similarly everyone said that they are expecting a simple application with no level of complexities in any of its functionalities. However participants from Kolenchery make their stern to have support/ guidance on using the system as they don't have much exposure to new technologically advanced devices.

In short, most from Mumbai agreed that they don't need any additional training on a new device or software designed to avoid language barrier unless it is too complicated to use. They are also open-minded people and so they can admit any kind of symbols and signage. People from Kanpur and Kolenchery admitted that they need guidance to acquaint with a new device as they don't have much outward exposure. Residents of Kanpur are not that much old-fashioned people and so they also accept most of the symbols. However they said their usage of such devices is very limited comparing to Mumbai.

Most of the experienced people declared that if the message is more concrete, and if the pictorial representation of the message matches to its corresponding message, then the probability of understanding that message is high. If the message is more conceptual, then the more arbitrary or abstract the image will be, causing a greater need that the relationship between the two be taught to the viewer. For example the symbol for biohazard (see Figure 8) is purely an abstraction with no association to its message and so is difficult to understand. Unless you are communicated the underlying meaning, it is just an arrangement of some shapes. So they suggested that the less abstract the concept, the easier its understanding will be.



Figure 8: Symbol for biohazard

### 10.3.3 Suggestions from inexperienced participants

The final nine questions in the questionnaire are to collect participants' opinions and suggestions on symbol based communication systems. This sub-section mainly details the participants' preferences for such a device/application. By analyzing the results of this section can provide more insight into what localization changes can be made to the application.

Almost all of the participants from Mumbai and Kanpur were having experience on mobile and computer except one or two from Kanpur. In contrast to this three-fourth of the participants from Kolenchery were not having any experience on mobile. Surprisingly, there were a few who didn't even see a mobile or computer. The reason behind this fact is that many of its adults are perhaps functionally literate but are literally illiterate. As they are technologically illiterate they made vote for technical training and help from tutors to gain knowledge on such aliens.

They all accepted the fact that in general Keralites are orthodox people except for some who live in cities. However majorities are inclined to the side of conventional people. Not to mention people from Kolenchery made their voice together that they cannot stand out from traditional beliefs and customs. They said the signs and symbols used should be aligned with their customs and beliefs. They also suggested making the proposed system in a simple way so

that illiterate people can even put their hands on such devices. Additionally they recommended using a minimum number of symbols to minimize the complexity.

As we all know many thousands of travelers are, in fact, illiterate in countries whose language they do not know and whose alphabet they may not even be able to decipher. There is, therefore, a need for graphic symbols for adaptation. As the number of tourists coming to Kerala is increasing day-by-day, most of the people from Kerala suggested that it is very important to have such devices in market so that they can help foreigners to have a nice and unforgettable stay at their place.

Researcher also got chance to interview some of the politicians in Kerala. They undoubtedly agreed that the literacy rate of politicians is very poor in Kerala and so such device will be welcomed warmly even by government so that politicians can communicate with peers from other states. They rejoiced even by hearing of such symbol based chatting application. However they also showed their concern on the so called “international” symbols and put forth many limitations on the symbols. The reason behind this limitation is that of the boundaries determined by the cultural-traditional-social denominators of gender-divide that limits the free mixing between the sexes, or among different castes or religious communities. For example, Keralities accept a symbol of a lady in the attire of a saree (see Figure 9) instead of a jeans or skirt or churidar as shown in the Figure 10.



Figure 9: Lady in saree (accepted)



Figure 10: Typical “Ladies” restroom symbol (unaccepted)

Another challenge identified in the interview with people in Kerala is the mobile network coverage. The mobile infrastructure in Kerala is not yet fully developed. About 60 per cent of the population is presently covered in the network, leaving the rest in out of coverage area. In addition the network that is standing has its weaknesses. In many places the network base stations have a long distance between them that developed country mobile phones are not

designed to support. Hence, the signal will be weak and not able to provide the full service that is expected. In worse cases, the phone might not pick up the signal at all.

## 11 Discussion and conclusion

This section concludes the thesis with a discussion of the study findings. In this section answers to the main study question and sub-questions are provided. Additionally, the areas where some improvements are essential to expand the market to India are also discussed based on the customer reactions presented in section 10.3. Furthermore, the possibilities of further research, as well as practical implications of this study are detailed.

The field study conducted in India confirms that there is definitely a future market for symbol based chatting system in India mainly to overcome the language barrier. The study claim that symbol based chat is an effective means to communicate across languages and cultures. However, care should be taken in the design and development of symbols. The results of the study revealed that there were several areas to be considered while designing a symbol based chatting system for Indians. Though there was a great degree of acceptance for such an application among Indians, a lot of challenges are also there. One such challenge is to make sure the symbols do cross the language and culture barriers, or, at the very least, convey their intended message. The study has revealed so many improvement areas for the proposed system to become a hit in India as well which is listed in the following paragraph and summarized in Table 13.

Table 13: Improvement areas

No.	Improvement area	Description
IA1	Symbol design	Visually simple High clarity, understandability and readability Uniform design Culturally accepted
IA2	Technology Illiteracy	Solve this issue by educating the masses
IA3	Assistance provided	Local training organizations are preferred Not effective to use certified trainers Freelance trainers are not popular
IA4	Signal sensitivity	Low mobile network coverage Make the application work offline also
IA5	Financial aid or price level	Lack of financial funds Make the application as cheap as possible Minimize the subscription or usage costs
IA6	Distribution channel	Include government procurement channels also

Note: IA represents improvement areas which will be used in Figure 11

*Symbol design:* Looking at the conditions in rural India, some adaptations for the symbols are desirable. Anybody should be able to read symbols because the symbols are expected to be read by anyone. There should be uniform design for the entire graphic system. Simplicity of the symbols should be maintained. Confusion with other symbol messages should be avoided. The symbol should not be particular to a specific culture. Instead, it needs to be understood by people of differing cultures from around the world. It should be cognizant of, and avoid, any cultural taboos. The educational level of the viewer should not be a factor in the symbol's understanding.

*Technology Illiteracy:* People who have never been in touch with communication technology are likely to be found in the most remote places. Not having seen any variant of telephone or experienced any type of real-time communication, using a mobile phone (or any other telephone) might appear alien. These problems might show in terms of difficulties in adjusting to communicate with an instrument instead of a face and hard times trying to interpret the symbols. The problems concerning illiteracy can be solved by educating the masses.

*Assistance provided:* It is not effective to use the certified trainers to educate the users in India because of the big market size. A certified trainer means one who have showed that he/she have met a set of standard skills/knowledge to train others in a particular field. Also freelance trainers are not as popular in India as in Finland. Freelance trainers are trainers who work by an hourly basis, rather than working on a regular salary basis for one employer. Instead, cooperation with local training organizations becomes more realistic and effective for market entry.

*Signal sensitivity:* By taking into consideration of the problem of mobile network coverage I suggest to make the application work offline also.

*Financial aid or price level:* Lack of financial funds to buy and use any of the ICT devices is most widespread impediment of ICT usage. It concerns at least 40 per cent of the population. Price minimizing may yield high market in India for this chat system. Therefore it is very important to press down the subscription or usage costs.

*Distribution channel:* Considering the temptation from political side it is wise to include government procurement channels also to the distribution channel.

The business model canvas presented in section 8.5 (Figure 7) can be modified to include the improvement suggestions presented in Table 13. This will enhance the market for SymbolChat in India. The modified business model canvas is presented in Figure 11.

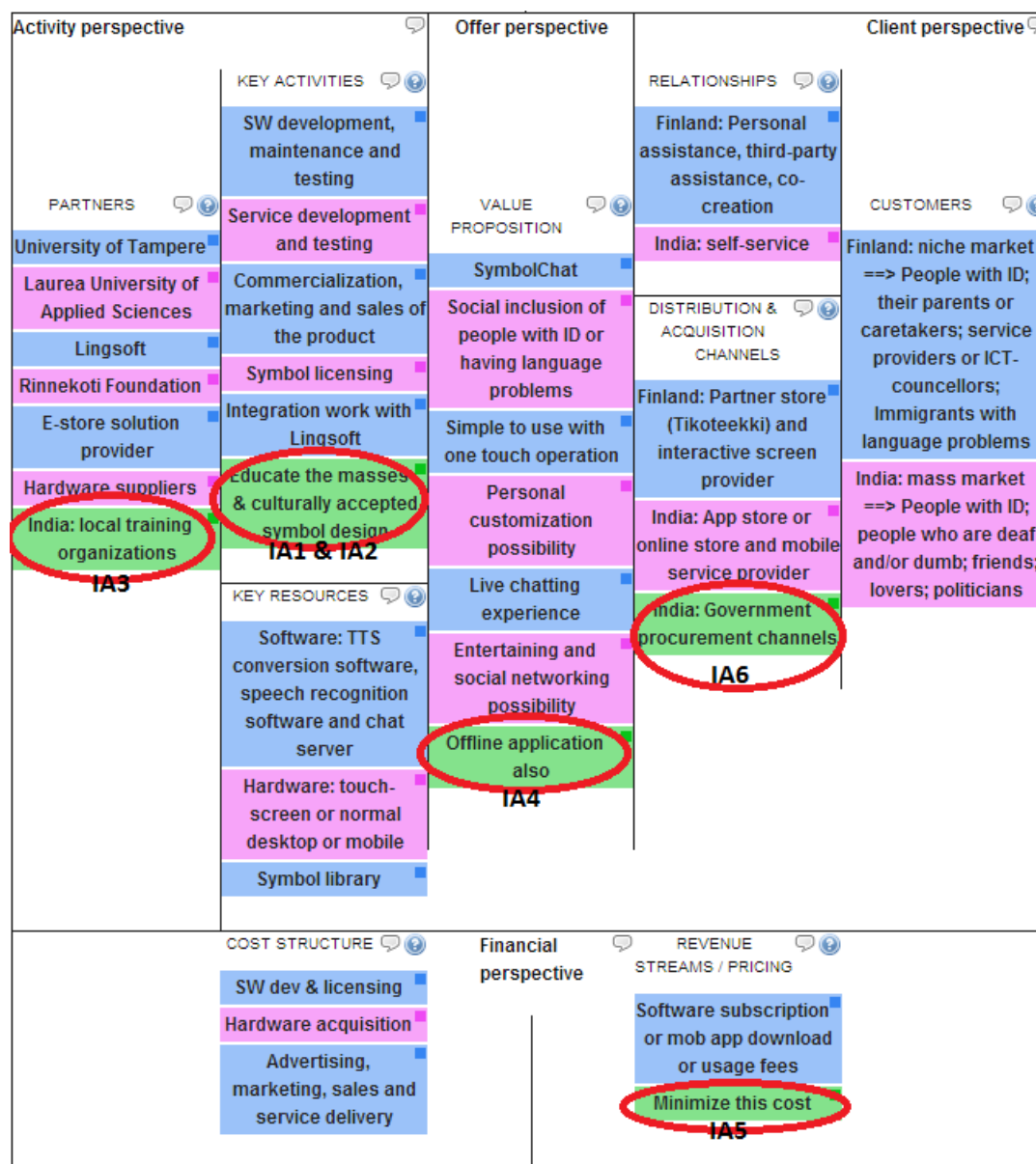


Figure 11: The improved business model canvas of SymbolChat for the case company

Note: IA represents improvement areas as given in Table 13

The sketch given in Figure 11 was also created with the help of BM|DESIGN|ER tool. Explanation of the tool is given in section 8.5. The model shown in Figure 11 uses three different colors to distinguish the layers. The blue and pink layers are the same as the old model. The green layer with a red oval is the improvement layer added to blocks. Each added layer is named with its corresponding name from Table 13. As said earlier elements in white background are the ones provided by the tool itself.

## 11.1 Answers to the questions of the thesis

Answers to questions outlined at the onset of the studies, as listed in section 1.1, are given in this sub-section. This part synthesizes the theoretical and empirical parts to answer the study's main question and sub-questions.

Sub-question 1: *What are service, service business and main characteristics of services?*

This sub-question is answered in section 2 by defining a service, its characteristics and service business. Though service literature defines service(s) in many ways, the service definition provided by Fitzsimmons & Fitzsimmons (2006, 4) is selected for this study. According to Fitzsimmons & Fitzsimmons (2006), 'a service is a time-perishable, intangible experience performed for a customer acting in the role of a co-producer'. Service business can be defined as firms that provide products that are intangible to consumers or other businesses. Despite of the various definitions for services, most of the authors have a similar voice on the four main characteristics for services which are intangibility, heterogeneity, inseparability, and perishability.

Sub-question 2: *How do you characterize ICT based services?*

This sub-question is answered in section 2.3. ICT is viewed as a general term covers any communication device or application such as radio, television, phones, computer and satellite systems. This study uses Einterz (2001) definition for ICT 'as tools that facilitate communication and the processing and transmission of information and the sharing of knowledge by electronic means'.

Sub-question 3: *How can ICT based services offer Intellectually Disabled People an increased degree of independence in their everyday life?*

This sub-question is answered in section 3. ICT offers the old and the young alike an opportunity to overcome social barriers to interaction and communication that can be caused by the lack of provision for impairments or life-long limiting illness. According to Andrich & Besio (2002) ICT gives the disabled person an improved quality of life through autonomy and empowerment.

Sub-question 4: *What are the communication barriers existing in India?*

This sub-question is answered in section 4. A wide variety of language and dialects are spoken by the Indian people. Further India has twenty two official languages and over thousands of



spoken languages. It is not possible to learn all of these languages and therefore it poses barriers to communicate with others who don't have a common language to communicate. Additionally more than half of the people are literate only in their mother tongue and this makes it hard for them to communicate with foreigners or with other state residents.

*Sub-question 5: What are business models in service and what kinds of different models exist in the literature?*

This sub-question is answered in section 5.1. According to Osterwalder, Pigneur & Tucci (2005) 'a business model is a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams.' Different models exist in the literature are listed in Table 5. Though there is no commonly agreed definition of the business model, it is possible to find some categorizations of the existing business model literature. Osterwalder, Pigneur & Tucci (2005) classified the business model articles into three categories: (1) studies that describe the business model concept as an abstract overarching concept that can describe all real world businesses, (2) studies that describe a number of different abstract types of business models or classification schemes, and (3) studies presenting aspects of or a conceptualization of a particular real world business model. (Storbacka & Nenonen 2009a)

*Sub-question 6: What is a business model canvas?*

This sub-question is answered in section 5.2. According to Osterwalder and Pigneur (2009) a business model canvas is "a strategic management tool, a visual template preformatted with the nine blocks of the business model, which allows to sketch-out new or existing business models". They mentions that a business model canvas can be described by looking at a set of nine building blocks that describes the logic of how an organization creates, delivers, and captures value. The nine building blocks namely, value proposition, target customer, distribution channel, customer relationships, value configuration, capability, partnership, cost structure and revenue model are further grouped to four categories or pillars as Osterwalder calls them product, customer interface, infrastructure management and financial aspects.

*Sub-question 7: How to design a business model for the case company?*

This sub-question is answered in sections 7 and 8. The task sequences that are followed in order to design a business model for the case company are formulating a set of questions, gather responses from stakeholders and finally design the business model with respect to the data collected from stakeholders. Qualitative methods used for this process were workshops, open-ended interviews and questionnaires. Questionnaires used for the interviews are gathered from the literary sources and are selected to represent the nine building blocks of Osterwalder's business model. The formulated set of questions was then presented to the stakeholders during workshop sessions, in the form of open-ended interviews. The notes taken during the interview were then being analysed (content analysis) and evaluated and listed in the business model canvas. This filled canvas is then sent to stakeholders for validation and changes incorporated to the canvas according to their opinions through several online discussions. The canvas renewal process continued till a saturation point has reached. The refined business model of SymbolChat is given in Figure 7.

*Sub-question 8: How to find out improvement areas for the service?*

This sub-question is answered in sections 9 and 10. In order to identify improvement areas for the service this study collected suggestions from the customers. A customer feedback (constructive feedback) study was conducted, prior to this thesis work, with intellectually disabled people for this SymbolChat application in Finland. The field study resulted in identifying the strengths and pitfalls of the application and furnished solutions to tackle the problems identified. However, open-ended interviews were conducted with Indian customers. A set of questions were prepared and asked with customers to get their opinion on the application. A picture of the user interface of SymbolChat application as shown in Figure 6 was also presented to the customers to know more on the symbol based communication. The collected opinions were content analyzed and identified a few improvement areas.

*Main question of the thesis: How to design a business model for a small & medium sized organization that offers ICT based services?*

If one can answer the above eight questions then this main question of the thesis is also answered. However, author likes to answer this question in a few sentences. Firstly, prepare a questionnaire in such a way to cover most aspects of the business field that surround a small and medium sized company. This can be accomplished by reviewing the available literary sources or in some cases the guideline questions given in Table 9 can be used with little modifications. This questions need to be answered from the stakeholders and design the intended business model. Next, you can refine the model by collecting feedback from

stakeholders. Finally, gather customer opinions on the service and identify further improvements and incorporate that also to the refined model. These steps help one to design a business model for a small & medium sized organization that offers ICT based services.

### 11.2 Managerial implications

The recommended actions for the managers of the case company would be, first, to allocate a responsible person for implementing the improvement suggestions specified in this report. By appointing a person in charge, the changes could be incorporated to the tool and could launch the product in Indian markets in a short period of time. This will remarkably hike the company's profit level.

After this, the case company can select few pilot customers to whom the services are offered. By piloting the business model itself the case company can start collecting experience of how the services are taken in by the customers and ask for customer feedback after successful cases. The business model can be further developed before starting broader marketing by doing a piloting phase for the model.

If the model services are accepted by the customers and the case company gain more satisfied customers, then the managers may also consider offering the services to other nations too.

As modelling businesses is a way to communicate business elements and structures to others, managers should use this canvas when they want to tell the story of the company. The guideline that helps to sketch the canvas might also be useful for managers if they want to design it again for some other tools or solutions.

### 11.3 Assessments of the study

The topicality of this study highlights the work done by Alexander Osterwalder and Pigneur (2009), who have tackled this research field recently and designed the concept business model canvas. Even though there is a wide range of studies concerning business models, none of these have performed the modeling as described in this thesis. Thus, this study has some new insights to the research field.

The results of the study are strictly aligned with the goal set of the beginning of the study. This goal was to design a business model for the case company so that any other similar sized organization that offers ICT based services can follow the same steps to design their business model. This goal seems to be perfectly fulfilled by following the three steps.

The first step was to understand the business model concept and to identify what are the key issues that need to be considered while business modelling. This goal was fulfilled through the theoretical section reviewed in this study. By understanding the concept of business model canvas developed by Alexander Osterwalder and Pigneur (2009), it became easier to find out the map of questions which were used in designing the canvas.

The second step was to address the issues identified by applying it to the case company. The input to this task was the set of questions identified in the first step. These guideline questions were presented to the stakeholders during workshop sessions and open-ended interviews. According to their responses a business model was designed for the case company and thereby reaching the second goal post.

The third step was to identify the improvement areas for the betterment of the company's business. This target was achieved by collecting potential user feedback by means of interviewing customers in India. Their comments were rich enough to improve the whole service in Indian market.

The main question of this study was "How to design a business model for a small & medium sized organization that offers ICT based services?". This question is addressed in this study by considering the generalization possibility of the study. By accomplishing the above three steps pave way to address the study question. That is, this study can be used as a roadmap by other similar sized organization to design a business model. Others can also use the questionnaire followed by making appropriate changes and collect and analyze data with respect to that. In this way the general study question is also answered fruitfully.

The validity and reliability assumptions discussed in section 6.5 were adhered too. The results can be strongly defended by the argument that the business model is composed based on a broad literature review, and the data collected from the case company are the best knowledge available on this. This assures that construct validity is attained. The final business model sketched in this study was presented to the stakeholders for revision and approval. This makes sure that internal validity is achieved.

Additionally the steps followed in this study can be applied to other similar sized organization, aiming to design a business model that offers ICT based services. To confirm this broader perspective of this study the researcher presented this study and its results in a conference named ServDes. The conference was conducted at Laurea University of Applied Sciences on 9<sup>th</sup> February 2012. The researcher got so many comments from the participants stressing the generalization possibility of this study. The published paper can be found out

from the ServDes website. This generalization possibility ensures that external validity is followed and overall these validations indicate that the data collected are valid and reliable.

The re-searcher herself is confident that all of the choices made, when composing the business model, are made based on the best possible information available. These factors make it fair for the researcher to genuinely recommend implementing the suggested business model and continue to further develop it in the endlessly changing economy. Overall, the researcher is satisfied with the results and even surprised to notice how the improvement suggestions can amplify company's profit.

#### 11.4 Future work

This study corroborates and based on previous research in business models and could be the starting point for future research in the ICT-based services industry. This study could be used by the case company in future as a reference for implementing appropriate solution with other tools or technologies. In addition to this, the actions undertaken in this study provides a roadmap for other similar sized organizations to develop a business model. The analysis of case company's business model might assist practitioners and academics in business modelling that best suits their specific purpose. The current model can be used as a reference model and it has the potential to guide future business model research in several ways.

Some aspects of the results stated in this thesis, however, are applicable to different service providers in ICT-based service industry and hence, it is hoped that parts of this thesis will be implemented, although, in a slightly modified context.

Nevertheless, life is composed of possibilities and unforeseen. As highlighted in the business model canvas part, customer needs are treated as the heart of a business operation. Hence, the key to success in business is to satisfy customers' by incorporating flexible strategies. So changes with respect to the customer needs urges further research for the business model revision.

Moreover, globalization is a reality and so business people should be more ambitious and farsighted to grab the market. The author recommends further researches related to the expansion of business to Finland's neighbour nations such as Sweden, Norway and Denmark. Besides, the Netherlands and even the United States of America are highly possible markets since there have been potential customers.

## 12 Summary

The service sector is a vital economic force for the prosperity of nations. The role of information technology enhances the value of ICT-based services in service business. Also ICT-based services are a boon to intellectually disabled people and linguistically impaired people.

In a nutshell, the purpose of this thesis was to design a business model for the case company that concentrates in developing ICT based services for intellectually disabled people and people having problems with certain languages. To be able to do this, Alexander Osterwalder's (2009) business model canvas was selected.

The target of the thesis was to seek out issues that have to be taken to account in business model creation. The issues that company faces to design a business model was collected from literary sources and formulated into a map of questions. With this map of questions, answers were gathered from stakeholders to design the business model for the case company.

The theoretical framework consisted of the review of the literature related to service, service business, ICT-based technologies, intellectual disability etc. A lot of definitions are reviewed to understand the true nature of services. In this study, it is proposed that service means activities undertaken for someone else. The literature mainly focuses on the service business and the growth of high-tech services over the past decades. The developments in the field of Information Technology, Mobile Technology and wide use of Internet resulted ICT based services.

The ICT-based services for intellectually disabled people and linguistically impaired people which were the center for the present study were also discussed, along with the theories that support them. The literature review revealed that there is a substantial need of ICT-based services to enrich the life of intellectually disabled people. Intellectually Disabled People can take advantage of ICT as a force for social inclusion. In addition to this, Alexander Osterwalder's business model is studied in depth to sketch a business model canvas for developing ICT-based services for intellectually disabled people and linguistically impaired people.

This study focused on composing a set of questions, gathered responses from stakeholders and designed a business model, using a qualitative approach. In order to draft the canvas there are total of 24 most relevant questions gathered from the literary sources. These questions have been selected to represent the nine building blocks of Alexander Osterwalder's business model. These questions were specifically selected to cover most aspects of the business field that surround a small or medium-sized company.

Main data collection methods used was workshops, interviews and questionnaires. The formulated set of questions was then presented in front of the stakeholders during workshop sessions, in the form of open-ended interviews. During the interview, notes were taken. The collected data were then being analysed and evaluated and listed in the business model canvas. This filled canvas is then sent to stakeholders for validation and changes incorporated to the canvas according to their opinions through several online discussions. The canvas renewal process continued till a saturation point has reached i.e. when there is no other suggestions from the stakeholders have identified. The user interface diagram given in Figure 6 of the SymbolChat application is then presented to the customers in India to collect their reflections on the communication tool. Based on the reflections from Indian customers a few improvement suggestions are put forth to the case company through this study. Briefly, the study illustrated that the business model canvas is a useful management tool to formulate the business model in a uniform manner and further this can be used to identify the improvement areas and thereby to improve the profit level of the business.

The customer reactions to the presented model indicate that the business model does have potential to be successful in the market. The reactions also reveal that well thought out service components especially with the symbols used is important part of the total value offering and the customers welcome them. Based on the interviews the customers from India are overwhelmed by the idea of symbols for overcoming the existing language barrier and symbol chat for communication. The symbols for overcoming the existing language barrier, which is the main differentiation factor of the application, seem to be important to all of the interviewees. Largest potential problem for company is possibly that people are reasonably unaware of the latest advancements in the field of ICT and related applications and they would need to get trainings to get most out of it. Another impending issue can be of the network coverage and less speed of the internet connection prevailing in India. To sum up, all the important suggestions to the case company are summarized in Table 14.

Table 14: Summary of the suggestions to the case company

No.	Suggestions to the case company
1	When expands to Indian market, some adaptations for the symbols are desirable
2	Educate the masses
3	Cooperate with local training companies, instead of freelance trainers
4	Develop an offline application
5	Set a suitable and reasonable price for the products and service
6	Put government procurement channels also as one of the distribution channel

However, the model will be applicable to the entire small and medium sized companies operating in various fields of business. They could use the map of questions identified for the case company by making minor additions or changes according to their field of business. Additionally they can follow the exact same steps followed in this study to create their business model and to validate the correctness with stakeholders and usability with customers. So generalization possibility of this study is high. In addition to this, the case company could use this model in future as well.



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## Appendix A Terminology

*Assistive technology or AT* is technology used by individuals with disabilities in order to perform functions that might otherwise be difficult or impossible. Assistive technology can include mobility devices such as walkers and wheelchairs, as well as hardware, software, and peripherals that assist people with disabilities in accessing computers or other information technologies. (AccessIT 2012)

*Agreement* is a contract between customer and supplier.

*Augmentative and Alternative Communication or AAC* means anything that can improve someone's ability to communicate (Penn State University 2000).

*Automated services* refer to more sophisticated form of customer self-service with automated processes (Osterwalder & Pigneur 2009, 29).

*Barriers to entry* Factors that obstruct or restrict entry of new firms into an industry or market (businessdictionary.com 2011)

*B0 format* (1000mm × 1414mm or 39.4in × 55.7in) is the dimension of the B series paper sizes as defined by ISO 216 (Website for paper sizes)

*Capital-intensive business* is a company that requires large investments in capital assets. (Bovee & Thill 2005, 4).

*Case company* is the company involved within the research.

*Cerebral palsy* (CP) is an umbrella term encompassing a group of non-progressive, non-contagious motor conditions that cause physical disability in human development, chiefly in the various areas of body movement.

*Co-creation* refers to co-create value with customers (Osterwalder & Pigneur 2009, 29).

*Communities* refer to maintain online user communities (Osterwalder & Pigneur 2009, 29).

*Customer service* is all interactions between a customer and a product provider at the time of sale, and thereafter. Customer service adds value to a product and builds enduring relationship. (businessdictionary.com 2011)

*Dedicated personal assistance* refers to dedicating a customer representative specifically to an individual client (Osterwalder & Pigneur 2009, 29).

Demographic segmentation: Customers have different preferences, and knowing these differences is vital to identify the target market for a business. Segmentation can be used for this to study the behavioral patterns of consumers by grouping people with similar traits. Gathering customer data such as a person's age, his or her lifestyle, employment, the average size of a family, marital status, religion and life cycle are all part of the factors involved in a demographic segment (howtodothings.com 2012).

*Diversified* refers to two unrelated customer segments with very different needs and problems (Osterwalder & Pigneur 2009, 21).

*F70-F73* The degree of ID was coded on ICD-10 criteria as F70, F71, F72, F73.

*Heterogeneity* Fundamental characteristic of services which results in variation from one service to another, or variation in the same service from day-to-day or from customer-to-customer. Heterogeneity makes it hard for a firm to standardize the quality of its services. (businessdictionary.com 2011)

*ICD-10* The International Classification of Diseases (ICD) is the standard diagnostic tool for epidemiology, health management and clinical purposes. It is used to monitor the incidence and prevalence of diseases and other health problems. ICD-10 was endorsed by the Forty-third World Health Assembly in May 1990 and came into use in WHO Member States as from 1994. (who.int 2012)

*Inseparability* Characteristic of services that makes them inseparable (1) from their means of production, and (2) from the customer's experience of them. (businessdictionary.com 2011)

*Intangibility* Fundamental characteristic of services referring to the fact that a service (since it lacks physical existence or form) cannot be seen, smelled, tasted, touched, or stored. (businessdictionary.com 2011)

An *intelligence quotient*, or *IQ*, is a score derived from one of several different standardized tests designed to assess intelligence (Health Noise 2011).

*Labor-intensive business* is a company in which labor costs are larger than capital costs (Bovee & Thill 2005, 4).

*Mass market* refers to customers with broadly similar needs and problems (Osterwalder & Pigneur 2009, 21). Also there is no specific segmentation for a company that follows the mass market element as the organization displays a wide view of potential clients (Cloud business 2012).

*Multi-sided platforms (or multi-sided markets)* refer to two or more interdependent customer segments (Osterwalder & Pigneur 2009, 21).

*Niche market* refers to customers with specific or specialized requirement (Osterwalder & Pigneur 2009, 21).

*Perishability* One of the four fundamental characteristics of a service, it refers to the fact that (in general) services cannot be produced and stockpiled (inventoried) before consumption: they exist only at the time of their production. (businessdictionary.com 2011)

*Personal assistance* means customer can communicate with a real customer representative (Osterwalder & Pigneur 2009, 29).

*Segmented* refers to customers with slightly different needs and problems (Osterwalder & Pigneur 2009, 21).

*Self-service* means no direct relationship with customers (Osterwalder & Pigneur 2009, 29).



## Appendix B Abbreviations

CH	Distribution Channel
CP	Cerebral palsy
CR	Customer Relationships
CS	Customer Segments
C\$	Cost Structure
IASSID	International Association of Scientific Study of Intellectual Disability
ICT	Information and Communication Technologies
ICD-10	International Statistical Classification of Diseases and Related Health Problems, tenth revision
ID	Intellectual Disability
IT	Information Technology
IQ	Intelligence Quotient
KA	Key Activities
KP	Key Partnerships
KR	Key Resources
MR	Mental Retardation
R\$	Revenue Streams
SD	Standard Deviations
US	United States
VP	Value Proposition
WHO	World Health Organization

## Appendix C List of questions to analyze the business model elements

Appendix\_C\_Table 1: Value proposition questions (Osterwalder &amp; Pigneur 2009, 23)

What value do we deliver to the customer?
Which one of our customers' problems are we helping to solve?
Which customer needs are we satisfying?
What bundles of products and services are we offering to each customer segment?

Appendix\_C\_Table 2: Target Customer questions (Osterwalder &amp; Pigneur 2009, 21)

For whom are we creating value?
Who are our most important customers?

Appendix\_C\_Table 3: Distribution Channel questions (Osterwalder &amp; Pigneur 2009, 27)

Through which Channels do our Customer Segments want to be reached?
How are we reaching them now?
How are our Channels integrated?
Which ones work best?
Which ones are most cost-efficient?
How are we integrating them with customer routines?

Appendix\_C\_Table 4: Customer Relationship questions (Osterwalder &amp; Pigneur 2009, 29)

What type of relationship does each of our Customer Segments expect us to establish and maintain with them?
Which ones have we established?
How costly are they?
How are they integrated with the rest of our business model?

Appendix\_C\_Table 5: Key activities (Osterwalder &amp; Pigneur 2009, 37)

What Key Activities do our Value Propositions require?
What Key Activities do our Distribution Channels require?
What Key Activities do our Customer Relationships require?
What Key Activities do our Revenue streams require?

Appendix\_C\_Table 6: Key resources questions (Osterwalder &amp; Pigneur 2009, 35)

What Key Resources do our Value Propositions require?
What Key Resources do our Distribution Channels require?

What Key Resources do our Customer Relationships require?
---

What Key Resources do our Revenue Streams require?
--

Appendix\_C\_Table 7: Key Partnerships questions (Osterwalder & Pigneur 2009, 39)

Who are our Key Partners?
---------------------------

Who are our key suppliers?
----------------------------

Which Key Resources are we acquiring from partners?
---

Which Key Activities do partners perform?
---

Appendix\_C\_Table 8: Cost structure questions (Osterwalder & Pigneur 2009, 41)

What are the most important costs inherent in our business model?
---

Which Key Resources are most expensive?
---

Which Key Activities are most expensive?
--

Appendix\_C\_Table 9: Revenue Streams questions (Osterwalder & Pigneur 2009, 31)

For what value are our customers really willing to pay?
---

For what do they currently pay?
---------------------------------

How are they currently paying?
--------------------------------

How would they prefer to pay?
-------------------------------

How much does each Revenue Stream contribute to overall revenues?
---

Appendix D Meeting minutes with stakeholders

The business model canvas sketched after each discussion is given in this section.

Meeting on 29 October 2011

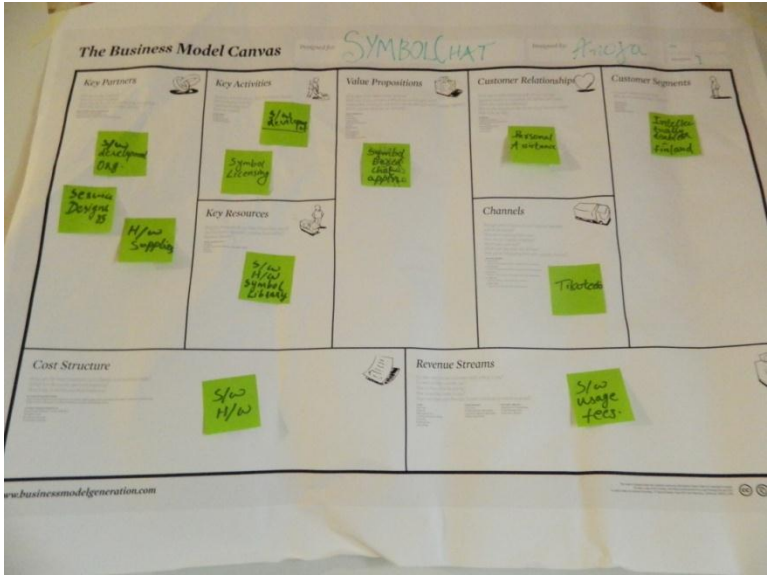


Figure 12: BMC for SymbolChat Version 1

Meeting on 27 January 2012

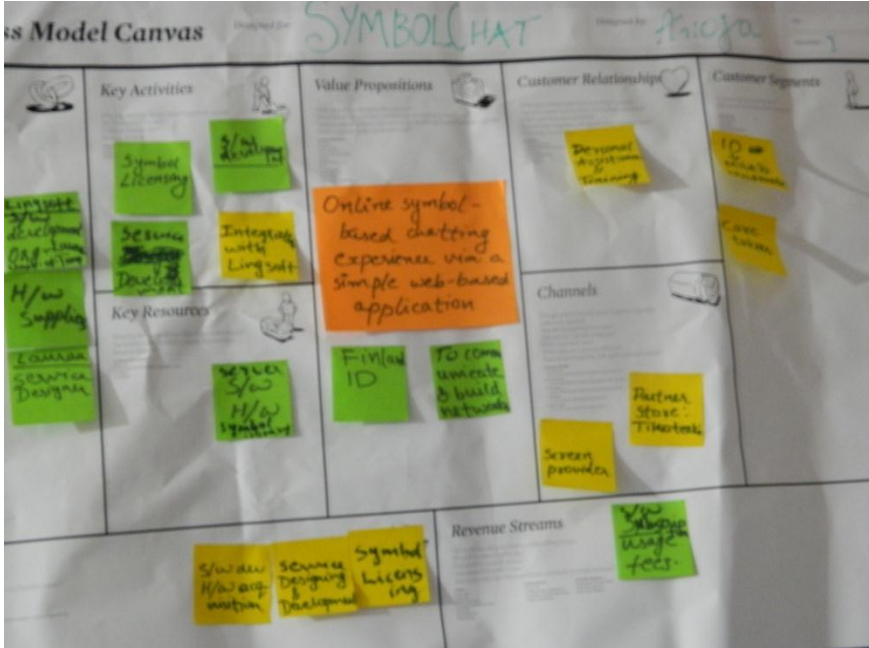


Figure 13: BMC for SymbolChat Version 2

Meeting on 6 February 2012

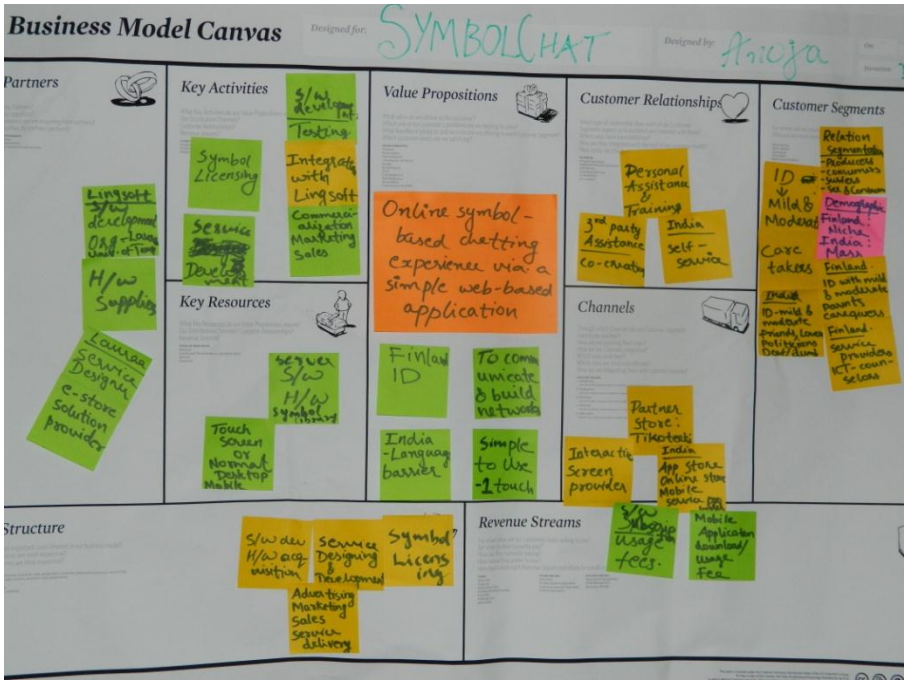


Figure 14: BMC for SymbolChat Version 3

Meeting on 7 February 2012



Figure 15: BMC for SymbolChat Version 4

## Appendix E Questions presented to the customers in Hindi

आईसीटी के उपयोग

- क्या आपके पास एक मोबाइल अथवा किसी अन्य कम्यूनीकेशन डिवाइसेज है?
- आपके परिवार में किसी को भी उपरोक्त उपकरणों के किसी भी है?
- आपको एक कंप्यूटर प्राप्य है?

हाँ, मुझे पास है।:

- क्या प्रयोजन में आप इन प्रौद्योगिकियों का उपयोग करते हैं?
- कितनी बार आप इंटरनेट और मोबाइल या अन्य कम्यूनीकेशन उपकरणों का उपयोग करते हैं?
- आपको क्या सुविधाओं या विशेषताओं सबसे अधिक पसंद है?
- क्या मायनों में यह अच्छा है?
- क्या मायनों में यह बुरा है?
- आप क्या भाषा में उपयोग करना पसंद करते हैं?
- आप इस तरह के एक उपकरण में भाषा बाधा से बचने के लिए क्या क्या विशेषताओं पसंद करते हैं?
- आप संचार के लिए किसी भी समय प्रतीकों का उपयोग करते हैं? इस प्रतीक आधारित संचार पर आपकी क्या टिप्पणी है?

नहीं, मुझे पास ये डिवाइसेज नहीं है।:

- आप किसी अन्य भाषा बोल के साथ कैसे संपर्क करूँ?
- यह अच्छी तरह से काम करता है?
- क्या प्रयोजन में आप संवाद करते हैं?
- इस भाषा बाधा टाल करने के लिए आपको एक युक्ति चाहते हैं?
- आप इस तरह के एक उपकरण में भाषा बाधा से बचने के लिए क्या क्या विशेषताओं पसंद करते हैं?
- इस तरह के एक उपकरण डिजाइन करने के लिए आपको किसी भी अन्य टिप्पणी या सुझाव है?
- प्रतीक आधारित संचार पर आपका क्या विचार है?
- आपको प्रतीकों और प्रतीकों का उपयोग संचार पर किसी भी पिछले अनुभव है?
- आपके दृष्टिकोण में संचार के लिए प्रतीकों डिजाइन करके क्या सुझाव है?

Appendix F Questions presented to the customers in Malayalam

ഐ.സി.ടി. യുടെ ഉപയോഗം

- > താങ്കളുടെ പക്കൽ മൊബൈൽ അല്ലെങ്കിൽ മറ്റേതെങ്കിലും ഐ.സി.ടി. ഉപകരണം ഉണ്ടോ?
- > താങ്കളുടെ ഉപകരണം ഉണ്ടോ?
- > താങ്കളുടെ കുടുംബത്തിൽ ആർക്കെങ്കിലും മേൽ പറഞ്ഞ ഉപകരണം ഉണ്ടോ ?
- > താങ്കൾക്ക് കമ്പ്യൂട്ടർ ഉപയോഗിക്കുവാൻ മാർഗ്ഗം ഉണ്ടോ?

ഉണ്ട്

- > താങ്കൾ എന്ത് പ്രയോജനത്തിനാണ് ഈ ശാസ്ത്ര വിദ്യകൾ ഉപയോഗിക്കുന്നത്?
- > താങ്കൾ എപ്പോൾ ആണ് ഇൻ്റർനെറ്റ് അല്ലെങ്കിൽ മൊബൈൽ അല്ലെങ്കിൽ മറ്റ് ആശയ വിനിമയ ഉപകരണങ്ങൾ ഉപയോഗിക്കുന്നത്?
- > എന്ത് സവിശേഷതയാണ് താങ്കൾക്ക് കൂടുതൽ ഇഷ്ടം?
- > എന്ത് തരത്തിൽ ആണ് ഇത് കൂടുതൽ ഉപയോഗപ്യം?
- > എന്ത് തരത്തിൽ ആണ് ഇത് ഉപയോഗ ശൂന്യം?
- > എന്ത് ഭാഷയിൽ ഉപയോഗിക്കുവാൻ ആണ് താത്പര്യം?
- > ഭാഷ പുശ്കനങ്ങൾ അതിജീവിയ്ക്കുവാൻ ഈ ഉപകരണത്തിൽ എന്ത് സജ്ജീകരണം ആണ് താങ്കൾ ആഗ്രഹിയ്ക്കുന്നത്?
- > താങ്കൾ ചിഹ്നങ്ങൾ ആശയ വിനിമയത്തിന് ഉപയോഗിച്ചിട്ടുണ്ടോ? ഈ ചിഹ്നങ്ങൾ ഉപയോഗിച്ചുള്ള ആശയ വിനിമയത്തിന് താങ്കളുടെ അഭിപ്രായം എന്താണ്?

ഇല്ല

- > മറ്റ് ഭാഷ സംസാരിയ്ക്കുന്ന വ്യക്തികളുമായി താങ്കൾ എങ്ങനെ ആശയവിനിമയം നടത്തുന്നു?
- > ഈ രീതിയിൽ താങ്കൾക്ക് പൂർണ്ണമായി ആശയവിനിമയം നടത്തുവാൻ സാധിയ്ക്കുന്നുണ്ടോ?
- > എന്ത് ആവശ്യങ്ങൾക്കാണ് താങ്കൾ ആശയവിനിമയം നടത്തുവാറുള്ളത്?
- > ഈ ഭാഷ പുശ്കനം നികത്തുവാനായി താങ്കൾക്ക് ഒരു ഉപകരണം ആവശ്യം എന്ന് തോന്നുന്നുണ്ടോ?
- > അങ്ങനെ ഒരു ഉപകരണത്തിൽ താങ്കൾ എന്ത് സവിശേഷതകൾ ആണ് പ്രതീക്ഷിയ്ക്കുന്നത്?
- > അങ്ങനെ ഒരു ഉപകരണം രൂപകല്പന ചെയ്യുന്നോൾ ശൃദ്ധിയേ്ക്കേണ്ട കാര്യങ്ങൾ?
- > ചിഹ്നങ്ങൾ ഉപയോഗിച്ചുള്ള ആശയവിനിമയത്തേക്കുറിച്ചു താങ്കളുടെ അഭിപ്രായം എന്താണ്?
- > താങ്കൾക്ക് ചിഹ്നവും അത് ഉപയോഗിച്ചുള്ള ആശയവിനിമയത്തിലും മുൻ പരിചയം ഉണ്ടോ?
- > ചിഹ്നങ്ങൾ ഉപയോഗിച്ചുള്ള ആശയ വിനിമയം രൂപകല്പന ചെയ്യുന്നതിൽ താങ്കളുടെ അഭിപ്രായം എന്താണ്?