**SCRUTINIZING BUSINESS MODELS USING PUBLICLY
AVAILABLE INFORMATION:
THE CASE OF COMMUNICATIONS ENABLED APPLICATIONS**

by

Laleh Rezaie Adl

A thesis submitted to the Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of
Master of Applied Science in Technology Innovation Management

Department of Systems and Computer Engineering

Carleton University

Ottawa, Canada, K1S 5B6

August 2011

©Copyright 2011 Laleh R. Adl

Library and Archives
Canada

Published Heritage
Branch

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque et
Archives Canada

Direction du
Patrimoine de l'édition

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file *Votre référence*
ISBN: 978-0-494-83049-9
Our file *Notre référence*
ISBN: 978-0-494-83049-9

NOTICE:

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protègent cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.

Canada

The undersigned hereby recommend to
the Faculty of Graduate Studies and Research acceptance of the thesis

**SCRUTINIZING BUSINESS MODELS USING PUBLICLY
AVAILABLE INFORMATION:
THE CASE OF COMMUNICATIONS ENABLED APPLICATIONS**

Submitted by

Laleh Rezaie Adl

In partial fulfillment of the requirement for the degree of
Master of Applied Science in Technology Innovation Management

Howard M. Schwartz, Department Chair

Tony Bailetti, Thesis Supervisor

Carleton University

August 2011

ABSTRACT

This research examines the business models of five large companies that supply communications enabled applications using (i) publicly available information and (ii) business model representations advanced by Johnson (2010) and Osterwaldner and Pigneur (2009). This research (i) generates eight propositions on distinct attributes of these companies' business models; (ii) proposes a classification of communications enabled market offers; and (iii) develops a model on how large suppliers of communications enabled applications improve and innovate their business models over time.

ACKNOWLEDGMENTS

I am deeply grateful to my parents for their boundless love, encouragement and support in pursuit of my studies and passions. Without their love, this milestone would have never been achieved.

I thank my thesis supervisor Professor Tony Bailetti for his thought provoking suggestions and guidance throughout the process of writing this thesis.

This thesis is dedicated to my grandmother, who passed away during its completion.

TABLE OF CONTENTS

ABSTRACT	III
LIST OF TABLES	VII
LIST OF FIGURES.....	VIII
LIST OF APPENDICES	XI
1 INTRODUCTION.....	1
1.1 Objectives	1
1.2 Deliverables	2
1.3 Relevance.....	2
1.4 Contributions	3
1.5 Organization.....	3
2 LITERATURE REVIEW	4
2.1 Business Model.....	4
2.2 Business model analysis constructs	7
2.3 Business model innovation	10
2.3.1 The white space frame.....	10
2.3.2 Open innovation business model.....	11
2.3.3 Platform business model	12
2.3.4 Disruptive business model.....	12
2.3.5 Multi-sided platform.....	13
2.4 Communication-enabled solutions	17
2.5 Lessons learned.....	20
3 RESEARCH METHOD	23
3.1 Unit of analysis	23
3.2 Study period.....	23
3.3 Research method.....	23
3.4 Research steps.....	27
3.4.1 Select structures to analyse business models	27
3.4.2 Select sample	30
3.4.3 Build database	30
3.4.4 Develop proposition anchored around the Four Box Model.....	31
3.4.5 Develop propositions anchored around interdependencies of the business model	31
3.4.6 Organize market offers	32
3.4.7 Analysis of BM innovation – develop the model.....	32

3.5	Representation of research method	32
4	RESULTS	34
4.1	Business model analysis	34
4.1.1	Sample	34
4.1.2	Results	34
4.1.3	Propositions	38
4.2	Analysis of interdependencies	40
4.2.1	Sample	40
4.2.2	Results	40
4.2.3	Propositions	42
4.3	Classification of communications enabled market offers	43
4.3.1	Unified Telephony and Unified Messaging	43
4.3.2	Unified Communications and CEBP	44
4.3.3	Communication and collaboration platform/Communication-enabled platform	46
4.4	Analysis of shifts in the basis of competition	49
4.4.1	Sample	49
4.4.2	Results	49
4.5	Analysis of shifts in problem solving	52
4.5.1	Sample	52
4.5.2	Results	52
4.6	Key findings.....	58
4.6.1	A model for business model innovation.....	58
4.6.2	Summary of results.....	60
5	DISCUSSION OF RESULTS	62
5.1	Insights gained while carrying out the research.....	62
5.1.1	Business model canvas.....	62
5.1.2	Johnson's White Space frame	63
5.2	Link with the literature	65
5.2.1	Analysis of business models.....	65
5.2.2	Analysis of interdependencies.....	66
5.2.3	Analysis of business model innovation	68
6	CONCLUSIONS, limitations and future research	77
6.1	Conclusions.....	77
6.2	Limitations	79
6.3	Opportunities for future research.....	79
	REFERENCES	80

LIST OF TABLES

Table 1- Research method.....	25
Table 2- Categorization of communications enabled market offers	48
Table 3- Identified Business model archetypes.....	73
Table 4- Data used for analysis of shifts in the problem solving	139

LIST OF FIGURES

Figure 1- Analysis of business models in two levels of abstractions	29
Figure 2- Research roadmap.....	33
Figure 3- A Four Box Model displaying the results of business model analysis	35
Figure 4- Anticipated growth curve in communications enablement	50
Figure 5- Solution based business models	54
Figure 6- Value adding process business models.....	55
Figure 7- Multi-sided platform business models.....	57
Figure 8- A new model for business model innovation	59
Figure 9- A business model canvas for Nortel/Avaya ACE	87
Figure 10- A business model canvas for Avaya Unified Communications	88
Figure 11- A business model canvas for Avaya Unified Messaging	89
Figure 12- A business model canvas for IBM UCC platform.....	90
Figure13- A business model canvas for IBM Lotus Sametime Converged Communications.....	91
Figure 14- A business model canvas for IBM Lotus Sametime Unified Telephony	92
Figure 15- A business model canvas for Microsoft Lync communications enabled business platform.....	93
Figure 16- A business model canvas for Microsoft Unified Communications	94
Figure 17- A business model canvas for Microsoft Unified Messaging	95

Figure 18- A business model canvas for Cisco Collaboration enabled business transformation platform.....	96
Figure 19- A business model canvas for Cisco Unified Application Integration platform	97
Figure 20- A business model canvas for Cisco Unified Communications.....	98
Figure 21- A Business Model Canvas for Cisco Unified Messaging.....	99
Figure 22- Avaya providing optimized communications to finance companies.....	104
Figure 23- Avaya retains high value customers for finance companies.....	105
Figure 24- Avaya delivers streamlined business workflows to healthcare	106
Figure 25- Avaya improves IT responsiveness for manufacturing and utility	108
Figure 26- Meridian IT Value Proposition.....	110
Figure 27- Polycom Value Proposition	112
Figure 28- Jabra Value Proposition.....	114
Figure 29- SpinVox Value Proposition	116
Figure 30- Microsoft provides agile communications for Oil and Gas industry.....	118
Figure 31- Microsoft provides high efficiency workplace for manufacturing industry..	120
Figure 32- Microsoft delivers resilient communications to government agencies	122
Figure 33- Cisco enhance communication's speed in mining and construction	124
Figure 34- Cisco delivers mobility to educational institution	125
Figure 35- Cisco provides rich collaboration for advertising industry	127
Figure 36-Avaya's Journey in Communications enablement	129

Figure 37- IBM's Journey in Communications enablement	131
Figure 38- Microsoft's Journey in Communications enablement	133
Figure 39- Cisco's Journey in Communications enablement.....	135
Figure 40- Avaya Unified Communications Platform architecture	148
Figure 41- Nortel/Avaya Agile Communications Environment	150

LIST OF APPENDICES

Appendix 1- 13 business model canvases	87
Appendix 2- 43 customer cases used for analysis of interdependencies.....	100
Appendix 3– 14 samples of analysis of interdependencies	104
Appendix 4- Analysis of shift in the basis of the competition	128
Appendix 5- White space beyond	137
Appendix 6- Description of the new model for BM innovation	140
Appendix 7- Description of CEA market offers	142
Appendix 8- Revised Business Model Canvas.....	171

1 INTRODUCTION

This research developed eight propositions that highlight the distinct elements of the business models of large suppliers of communications enabled applications (CEAs). The propositions are anchored around a model that identifies the factors leading to business model innovation and describe how companies improve their business models.

For the purpose of this research, the terms business model and communications enabled application (CEA) are defined as follows:

A business model is an illustration of how a business intends to operate and generate revenue. A business model is a representation of how a business creates and delivers value for the customers and the company (Johnson, 2010).

A CEA refers to an integrated system solution that eliminates human delay in business processes (Roese, 2007).

1.1 Objectives

The objectives of this research are to use publicly available information and business model representations advanced by Johnson (2010) and Osterwaldner and Pigneur (2009) to:

- Examine the business models of large companies that supply CEAs
- Analyze how these companies refine and innovate their business models

1.2 Deliverables

The deliverables from this thesis include:

1. Propositions that highlight the distinct aspects of business models used by large suppliers of CEAs
2. A classification of communications enabled market offers
3. A model that highlights how large suppliers of CEAs refine and innovate their business models

1.3 Relevance

This research is relevant to at least three groups: (i) top management teams and executive directors of non-profit organizations, (ii) academics, and (iii) entrepreneurs.

First, this research is relevant to top management teams and directors of non-profit organizations because it provides a visual representation and a language they can use to talk about their business models and guide action to improve them. Top management teams and directors of non-profit organizations can reduce the time required to implement changes in their organizations by using this visual representation of business models.

Second, this research is relevant to academics because it uses the business model as a unit of analysis. The use of the business model as a unit of analysis is an emerging trend in management research (Zott, Amit and Massa, 2011).

Third, entrepreneurs can benefit from this research because it allows them to visualize how large companies configure or re-configure the resources required to create and deliver new customer value.

1.4 Contributions

This research makes at least two contributions. First, it provides a process that reduces the time and effort required to describe, analyze and improve how a company makes money.

Second, it provides a model that can be used to predict the circumstances whereby a model change is required. This model offers opportunities to lower costs and associated risks of improving business models or creating new ones.

1.5 Organization

This thesis is organized into six chapters. Chapter 1 is the introduction. Chapter 2 provides the literature review and the lessons learnt from it. In Chapter 3 the research method is described. Chapter 4 shows the results of the research and Chapter 5 provides a discussion of the results. Finally, Chapter 6 provides the conclusions, limitations, and suggestions for future research.

2 LITERATURE REVIEW

This chapter is organized into five sections. Section 2.1 reviews the literature on Business Models while Section 2.2 provides a literature review on constructs of business model analysis. Section 2.3 presents a literature on business model innovation explaining the White Space frame, Open Innovation Business Models, Platform Business Models, Disruptive Business Models and Multi-sided Platforms. Section 2.4 reviews the literature on Communications-enabled solutions. The last section, Section 2.5, presents the lessons learned from the literature review.

2.1 Business Model

According to a recent article, more than one thousand articles on business models have been published since 1995 (Zott, Amit & Massa, 2011). Attention on business models has increased exponentially.

Magretta (2002) argues that whether or not its founders realize it, every organization is built on a business model. Amit and Zott (2001) argue that despite the frequent use of the term business model in the academic literature, the concept still remains poorly understood.

Research on e-business models addresses two complementary streams: taxonomies of business models and definitions of the components (Hedman & Kalling, 2001).

Timmers (1998) defines the business model as the architecture for the product, service and information flows, a description of the benefits for the business actors involved and sources of revenue. Timmer's definition does not limit the notion of a business model to e-commerce. He applies business models to that domain, using two dimensions 1) functional integration and 2) degree of innovation, ranging from simply migrating a traditional business to the Internet, to creating new ways of doing business. The result is eleven distinct Internet business models.

Tapscott, Ticoll and Lowy (2000) provide another typology of business models. They focus on the system of suppliers, distributors, commerce service providers, infrastructure providers and customers, and label this system the *business-web* or *b-web*. They differentiate business-webs along two dimensions: control (from self-control to hierarchical) and value integration (from high to low), identifying five generic b-webs. They name these *Agoras*, *Aggregations*, *Value Chains*, *Alliances* and *Distribution Networks*.

Weill and Vitale (2001) present a systematic analysis of eight atomic e-business models, each of which can be implemented as a pure e-business model or combined to create a hybrid model. Each model is analyzed according to its strategic objectives, value proposition, its sources of revenue, critical success factors and core competencies. The

authors also outline different model channels, customer segments and the Information Technology (IT) infrastructure required to implement them.

Rappa (2003) defines a business model as “the method of doing business by which a company can sustain itself”. The business model defines the way a company makes money by specifying where it is positioned in the value chain. Rappa’s taxonomy consists of nine generic forms of e-business models. These generic forms classify companies based on the nature of the value proposition or their mode of generating revenues, e.g. example, advertising, subscription or utility model.

Other definitions of business models emphasize the design of the transactions of a firm in creating value (Amit & Zott, 2001), the blend of the value stream for buyers and partners, the revenue stream, the design of the supply chain (Mahadevan, 2000), and the firm’s core logic for creating value (Linder & Cantrell, 2000). Chesbrough and Rosenblom (2002) conceptualized a business model as a construct which mediates the value creation process. It translates between the technical and the economic domains, selecting and filtering technologies and packaging them into particular configurations to be offered to the chosen target market.

Common to all of these definitions of business and e-business models is an emphasis on how a firm makes money. Porter (2001) described the emphasis in business models on

generating revenues as “a far cry from creating economic value”. In contrast, Magretta (2002) argued that the strength of a business model is that it tells a story about the business, focusing attention on how pieces of the business fit together along with the strategy describing how the company differentiates itself in dealing with the competition.

2.2 Business model analysis constructs

Gordjin, Akkermans and Vliet (2001) provided a way to better understand e-business models by focusing on value flows between several actors of the e-business model. They identify two main elements: value oriented and actor oriented.

Afuah and Tucci (2001) provide a value centered view of business model which takes into account the creation of value through several actors. They offer components of a business model that include scope over pricing and revenue source as well as connected activities and capabilities.

Amit and Zott (2001) offer a network-centered structure for business models. They conceptualize a business model as an architectural configuration of the components of transactions in creating value. Their structure depicts the ways in which transactions are enabled by a network of firms, suppliers, complementors and customers.

Petrovic, Kittl and Teksten (2001) suggest that a business model can be divided into seven sub models: value model, resource model, production, customer relationships, revenue, capital and market model. The sub systems and their relationships describe the logic of the business system for creating value that lies behind the actual processes.

Osterwalder, Lagha and Pigneur (2002) make an attempt to integrate various business model perspectives. They propose an e-business model structure with four pillars: the products and services a firm offers, the infrastructure and network of partners, customer relationship capital and the financial aspects.

Osterwaldner and Pigneur (2009) use nine building blocks to illustrate the logic of how a company makes money. Their *Business Model Canvas* consists of nine blocks, which cover four predefined main areas of a business: Customers, Offer, Infrastructure and Financial viability. The building blocks include customer segments, value proposition, channels, customer relationships, revenue streams, key resources, activities, partnerships and cost structure. They also highlight similar behaviours and characteristics as patterns to help understand the dynamics of business models.

Johnson (2010) argued that the architecture underlying all businesses consists of four interdependent elements: (i) a customer value proposition (CVP); (ii) profit formula; (iii) key resources; and (iv) key processes.

The Customer Value Proposition (CVP) identifies an important, unsatisfied customer problem or job needed to be done and then proposes a product or service combination at a given price.

The profit formula defines the way the company captures value for itself and its stakeholders in the form of profit. It distils into four variables: a revenue model, cost structure, target unit margin and resource velocity.

Key resources and key processes constitute the third and fourth elements of the model. They include critical assets; skills, activities and routines representing different ways companies fulfill the CVP and the profit formula.

Business rules, behavioural norms, and success metrics connect the elements of a business model and keep the system in proper balance. They ensure that the business can repeatedly and predictably deliver the customer value proposition and fulfill the proper formula (Johnson, 2010). The power of this simple construct lies in the interdependencies of key elements and the ability to integrate harmoniously in support of the value propositions.

2.3 Business model innovation

2.3.1 The white space frame

The top management team's ability to evolve or transform a current business model into a new business model is important. As a company matures, its efforts and capabilities become concentrated on its core space (Johnson, 2010). It improves existing products and services and creates new ones, increases efficiency by enhancing processes and refining key business rules and metrics, all to extract the most value from its core sources of growth.

Most growth opportunities companies identify are close to the company's core. They are known as *adjacencies*. These adjacent opportunities fit quite well within the existing business model. However, to exploit opportunities that lie beyond the adjacencies, a company needs to operate in a new way, one which uses a new set of resources, processes and activities.

Johnson (2010) uses the term *white space* to mean a place where there's no competition. Either because it is an entirely new market or gaps in existing markets or product lines exist.

Johnson (2010) differentiates contexts for business innovation: white space within, beyond and between. *White space within* means to take opportunities emerging from

shifts in the basis of competition or unserved jobs in existing markets. *White space beyond* refers to opportunities which require opening up new markets and *white space between* deals with industry discontinuities.

Johnson (2010) designed a three-step process for business model innovation. The process starts by uncovering jobs that real customers need to be done. The second step is to develop a blueprint for the new business model that can fulfill this job profitably and at a price customers are willing to pay. The third step is the process of implementing the new business model, not all at once but as carefully planned series of low-risk experiments in which managers test hypotheses about the model and apply lessons learned.

2.3.2 Open innovation business model

Chesbrough (2006) provides a six-stage construct for companies to assess their current business model relative to a benchmark and determine appropriate next steps to advance it to higher levels of openness. His approach to open business models focuses on an intellectual property (IP) perspective. Open business models do not examine individual IP assets by just assessing specific technologies. Chesbrough (2006) conceptualizes IP in bundles or clusters within an overall portfolio. Internal IP that is not supporting the company's open business model becomes a candidate for external licensing or an outright sale while an external IP, which complements open business models becomes a good candidate for acquisition from the outside.

2.3.3 Platform business model

Companies in every sector of the economy are evolving into platform-based competitors. Therefore, business models are shifting from being *firm-centric* to *network-centric*. On a global basis, successful business model innovations in the competitive era require a dynamic platform business model because innovations straddle multiple companies, involving the coordination of the capabilities of different companies in order to succeed (Venkatraman & Henderson, 2008).

Based on who sells to whom, Boudreau and Lakhani (2009) identify three categories of business model *integrator*, *product* and *two-sided*. In the integrator model, the platform is wedged between external innovators and customer. The company incorporates outside innovations and sells the final products to customers. External innovators in the product platform model build on top of the platform's foundation technology and sell the resulting products to customers. Lastly, in two-sided platforms external innovators and customers are free to transact with each other as long as they also affiliated with the platform's owner.

2.3.4 Disruptive business model

Frequently what makes a disruption so hard for companies to respond to is that what is being disrupted is their business model not necessarily their technology. Most of the time what gets disrupted in big companies is their margin structure that couldn't sustain the

way the company distributed its existing products or its profit expectations for sales (Johnson, 2010).

A disruptive business model that can generate attractive profits at the discount prices at the low end of the market is a valuable growth asset. When executives of incumbents move their business model up market, making higher performance products that sell at higher price points, much of the increment in pricing is added to the bottom line. It continues to add as long as the disruptor can keep moving up, competing at the margin against the higher cost disrptee. On the other hand, when the disruptor tries to take a higher cost business model down market, selling products at lower price points, almost non of the incremental revenue will be added to the bottom line. It gets absorbed into overhead. This is why established firms need to grow from within an autonomous business, with a cost structure that offers as much headroom as possible for the subsequent profitable migration up market. Moving up the trajectory into successfully higher margin tiers of the market, is something that all managers of the disruptor must do, in order to keep margins strong (Christensen, 2008).

2.3.5 Multi-sided platform

Multi-sided markets are markets where one or several platforms enable interactions between end-users, trying to get multiple sides “on board” by appropriately charging each side. Multi-sided platforms provide support for interactions among the various groups

supported. Each side needs access to the multi-sided platform to reach other groups. The platform doesn't substitute itself for any groups in these interactions (Hagiu, 2005). Pretty much any market would be multi-sided if getting all sides on board was not restrictive. For a market to be considered as multi-sided, a general set of conditions applies (Rochet & Tirole, 2003; Evans, 2003; Armstrong, 2006; Caillaud & Jullien, 2003). Multi-sided markets are ones in which the volume of transactions between end-users depends on the structure and not only on the level of fees charged by the platform. In other words, a market is multi-sided if the platform affects the volume of transactions by charging more to one side of the market and reducing the price paid by the other side, equally (Rochet & Tirole, 2004).

In recent years, the exceptional nature of multi-sided markets has gripped the attention of conceptualists with a concentration in pricing strategies. Parker and Van Alstyne (2005), Rochet and Tirole (2001, 2003, 2004), Armstrong and Wright (2007), and Jullien (2004) examine how standard pricing policies for maximizing profit should be restructured when markets are two-sided.

Rochet and Tirole (2001) study competition between platforms in two-sided markets. They examine the structure of participation fees, characterizing the structure of matching fees for monopoly settings and considering for-profit and non-for-profit undertakings. They propose a model that considers the relationships between ownership and pricing and

ignores the relationship between ownership and design. Rochet and Tirole (2003) consider platform competition generally and investigate some characteristics of payment markets. First, they provide a construct to model platform competition, which is applicable to various markets. Second, they characterize the determinants of price allocation between end-users. There may be instances where one end-user subsidizes the other. Third, they found that the seller's price increases the captive buyers and decreases when there are marquee buyers, under certain conditions. Similarly, the buyer's price moves in the opposite direction. Captive buyers prefer to use a particular platform and marquee buyers are coveted by sellers.

Caillaud and Jullien (2003) consider homogeneous populations on the two sides of the platform to examine competition with both participation and matching fees. Armstrong (2002) reviews the existing literature and analyzes examples of two-sided markets.

Platforms can increase social surplus when three necessary conditions are in play: (1) distinct groups of members exist; (2) members of at least one group wish to access other groups and (3) the platform can facilitate the access more efficiently than bi-lateral relationships between members of the groups (Evans, 2003). In other words, the benefit enjoyed by one group and its level of demand depends upon how well the platform attracts customers from other groups and the level of the demand of the other groups (Armstrong, 2006). A growing body of research has examined how platform owners can

encourage third-party complementors to contribute to a platform and to stimulate indirect network effects. For example, theory research in literature has examined platform owner decisions to open a platform (Boudreau, 2007; Eisenmann et al., 2008; Gawer & Cusumano, 2002; Gawer & Henderson, 2007; Parker & Van Alstyne, 2008; West, 2003) and vendors' strategic responses to open and closed platforms (Lee & Mendelson, 2008; Mantena et al., 2007). Empirical work has sought to measure the value of network effects to end users (Brynjolfsson & Kemerer, 1996; Gallagher & Wang, 2002; Gandal, 1995; Liu et al., 2008; Zhu & Iansiti, 2009) as well as the effects of increasing openness on competition (Boudreau, 2007).

Of particular concern is research related to strategies used by a platform owner to manage platform stakeholders such as end users and complementors (Gawer & Cusumano, 2002; Gawer & Henderson, 2007; Iansiti & Levien, 2004) focusing on the fine line that platform sponsors must walk between maximizing profits and leaving sufficient residual profit opportunities to encourage complementary innovation. One of the most important business decisions multi-sided platforms have to make is the choice of pricing structure (Hagiu, 2005). Price structure matters since the platform affects the volume of the transactions by charging more to one side and reducing the price paid by the other side by an equal amount. Therefore, the platform must have it designed properly in order to be able to bring multiple sides on board.

Platforms should take balancing actions between multiple sides along various policy dimensions not only with respect to pricing structures, but also by regulating terms of transactions between end users, screen members in non-price related ways and monitor internal and external competition. In all circumstances, profit has to be scarified by constraining one side to increase attractiveness on the other side (Evans et al., 2006). Whenever price structures are complex or inefficient, the platform makes itself attractive by encouraging competition on the other side. Competition on the other side brings prices closer to marginal cost and volume of interactions adjacent to efficient volume (Rochet & Tirole, 2004). An important characteristic of multi-sided markets is that the demand on each side vanishes if there is no demand on the others, regardless of what the price is. Therefore, participants in these markets have to figure out ways to get both sides on board (Rochet & Tirole, 2004; Hagiu, 2005). One way to do this is to attract a critical mass of users on one side of the market by giving them free services, which is an uncommon strategy especially when at the entry phase. Another way to get multiple sides on board is to invest in order to lower the cost of consumers on one side of the market. Even in some cases, companies initially take over one side of the platform to get the market going.

2.4 Communication-enabled solutions

Many enterprises nowadays are seeking to transform their business model through network convergence which enables them to drive next generation revenue growth and

sustainability. Network convergence manipulates all forms of voice, data and video across all types of network (Blackman, 1998). Accelerating such transformation is possible through effective integration of IT and telecom capabilities and truly “communication-enable” applications, workflows and processes. Unifying business applications with a wide range of network communications capabilities such as contact center, interactive voice response, instant messaging and unified communications to create communications enabled solutions brings new levels of efficiency and productivity to all types of business environments (Carbone, 2007). These solutions speed-up collaboration and business processes, improve agility and increase productivity.

CEAs make different applications communicate with each other. According to industry leaders, what differentiates CEAs from other solutions is their ability to eliminate human delays (Roese, 2007). CEAs automate communications and IT processes in order to 1) reduce or eliminate the amount of time it takes humans to react based on information received, 2) reduce costs by simplifying complex interactions, 3) increase value of the user’s experience and 4) enable new services (Bailetti, 2009).

According to a Microsoft study in 2006, one in four workers spends an average three full working days each year, trying unsuccessfully to contact people over the phone (Nortel Technical Journal, 2007). In broader spectrum, Sage researchers found that on Unified Communication Applications (UCA), projects were delayed or deadline missed about

22% of the time on a monthly basis (Nortel Technical Journal, 2007). CEAs bridge the gap between business applications and communications infrastructure, utilizing an enterprise IT model based on Service Oriented Architecture (SOA) principles to create new capabilities.

Service Oriented Architectures enable designers to build an application by invoking interfaces published by other services deployed within the SOA model (Venkatachalam et al., 2008). It provides a flexible and dynamic infrastructure for implementing integrated business solutions with both business driven and platform driven requirements. The business requirements prescribe certain component structures, interactions and reconfigurations which have to conform to interaction and configuration mechanisms provided by underlying platform (Baresi et al., 2006). Interactions amongst various services specified by means of generic interfaces between them for performing certain particular tasks (Kanaparti, 2008).

Looking for solutions beyond unification of communication and access coined as Unified Communications (UC) systems, which have been deployed for a number of years, firms started to utilize systems to directly link their business processes with different forms of communication in an integrated way (Rybczynski & Shetty, 2005). Communication Enabled Business Process (CEBP) expresses this notion, accelerating processing time as well as removing points of friction in communication (Software AG WebMethods). The

benefit of CEBP lies in the integration of structured and repetitive business processes including less upfront investment in infrastructure, predictable cost model, possibility of different service level agreement and easy to upgrade (Rake et al., 2009). However, business processes can be communication-enabled through standard solutions of UC, CEA or any other communication enabled system solutions.

A CEA is distinguished from other integrated systems or applications by process flow management and agent attributes that depend on real time networking capabilities and one or more network oriented functions such as location, presence, proximity and identity (Bailetti, 2009).

2.5 Lessons learned

The business model is emerging as a new unit of analysis (Zott, Amit & Massa) and studies that examine business models of suppliers of CEAs have not been published.

A Customer Value Proposition (CVP) is the key building block of all business models. The CVP describes how a company creates value for a given set of customers at a given price.

All key elements of a business model need to be internally consistent. If a company operates in a way that some of its key elements of a business model conflict, it will fail.

Companies find changing their business models difficult for two main reasons. First, companies tend to change their business models using the same logic they use to launch a new product line using current business models.

Business model innovation requires new models to be created, tested and updated using an iterative process. Many companies don't have the knowledge, skills or time to deal with these iterations.

A business model reflects how a company does business and it is embodied in rules, metrics, and behavioural norms the company establishes to make sure the operations and the business processes in a repeatable fashion. As the business improves at executing their business model, certain parts become rigid so the company reaches the point that it is not able to do things in different ways from the core business model. Thus, rules, norms, and metrics can make it difficult for a company to go into a new market or transform an existing market with a new model.

Opportunities for business model innovation arise whenever customers have jobs to be done that are not satisfied by the existing customer value propositions (CVP). Business model innovation does not discover new products or services; it simply redefines what and how the company fulfils the job to be done for the customers.

Designing truly communication enabled solutions requires an in depth understanding of business processes, information flows and communication types of each particular business as much as the required technology advancement.

Platforms need to make three key strategic decisions to achieve sustainability. First they need to define the scope and structure of the platform. Second they need to make pricing decisions. Third they need to make decisions that provide differentiation.

3 RESEARCH METHOD

Chapter 3 describes the research method. It is organized into five sections. Section 3.1 identifies the unit of analysis. Section 3.2 identifies the study period. Section 3.3 provides an overview of the steps used to carry out the research. Section 3.4 describes each step carried out to complete the research. Section 5 provides a diagram to illustrate the research method.

3.1 Unit of analysis

The unit of analysis is a business model used by a large telecommunications or computer company to develop and sell CEAs.

3.2 Study period

The data used in this research was gathered during the months of October and November 2010 and covered the seven year period, 1st of January, 2003 to 1st of January, 2010.

3.3 Research method

A single case study with embedded units was used to examine business models of suppliers of CEAs. Different business models in more than one environment (circumstance) were examined. Since, each environment requires a specific type of innovation (product innovation, process innovation and business model innovation), single case study with embedded units was recognized as the preferable type of case

study for the purpose of this research. This research is consistent with the “Within-Case” approach (Yin, 2003).

This research was organized into three parts:

- Propositions anchored around business models of large suppliers of CEAs
- Propositions anchored around interdependencies among the elements of the business models of large suppliers of CEAs
- A data-driven model of business model innovation relevant to CEA suppliers

Table 1 shows the research method. For each step of the method, Table 1 provides: inputs, key activities carried out and outputs.

Table 1 - Research method

	Step	Inputs	Key activities	Outputs
1	Select structures to analyse business models	Articles from the literature	Review literature Identify approaches to organize elements of a business model Select the structures for research	Set of structures to examine elements of a business model and the relationships among these elements
2	Select sample	Population of CEAs developed and sold by large telecommunications or computer companies	Define sample criteria Identify members of population that meet criteria	Sample comprised of market offers that met criteria
3	Build database	Sample of market offers Structures selected	Collect data required to populate the structures selected to examine business models Enter data into a database	Database
4	Develop propositions anchored around Four Box Model	Four box model to organize elements of business model Data on sample	Identify the number of unique business models in sample Organize data on	Propositions anchored around business models of large suppliers

			<p>elements of Business Models using BM Canvas</p> <p>Identify unique attributes of sample canvases using Four Box Business Model</p> <p>Develop four propositions that highlight those attributes</p>	of CEAs
5	Develop propositions anchored around interdependencies among elements of business model	<p>Value proposition model to organize the interdependencies among elements of a business model</p> <p>Data on sample</p>	<p>For each market offer, organize data on interdependencies among elements of a business model</p> <p>Examine the interdependencies across all market offers</p> <p>Use data to develop propositions</p>	Set 2 of propositions on business models for CEAs
6	Organize market offers	Model to organize CEA market offers	Classify CEA market offers	Classification of CEA market offers

7	Develop model for business model innovation	White space within model White space beyond model Classification of market offers	Organize data using white space within and white space beyond models Use data to develop a bottom up model	Model for business model innovation
---	---	---	---	-------------------------------------

3.4 Research steps

The following seven steps were performed to undertake this research:

3.4.1 Select structures to analyse business models

The literature was reviewed for the purpose of identifying models that can be used to visualize and organize data on business models.

The following models were considered:

1. Afuah and Tucci (2001): Business model components
2. Alt and Zimmermann (2001): Six generic elements of business models
3. Boudreau and Lakhani (2009): Platform business models
4. Chesbrough and Rosenbloom (2002): Six functions of business models
5. Hamel (2000): Business model components
6. Johnson (2010): White Space Frame
7. Johnson, Christensen and Kagermann (2008): Four Box Business Model
8. Osterwaldner (2004): Business model ontology
9. Osterwaldner and Pigneur (2009): Business Model Canvas

10. Petrovic, Kittl and Teksten (2001): Seven sub-models business models
11. Venkatraman and Henderson (2008): Four vector business models
12. Weill and Vitale (2000): Eight atomic elements of business models

The following models were selected to carry out the research:

1. Johnson's Model (2010) for growth and renewal including White Space Within, White Space Beyond and the frame for analysis of interdependencies.
2. Johnson, Christensen and Kagermann's Four Box Business Model (2008) to identify the unique characteristics of business models of the large suppliers of CEAs
3. Osterwaldner and Pigneur's Business Model Canvas (2009) for modeling the data of business models.

These three models were selected for two reasons: First, given the constraints to use public information readily available over the Internet, these models provided a suitable level of abstraction to perform the analysis and generate the deliverables of this thesis (Figure 1 shows the relationships between two levels of abstractions). Second, the three models covered all the elements or aspects of the business models and business model innovation that were included in the other models. Moreover, a strong logic was used to integrate them.

Figure 1- Analysis of business models in two levels of abstractions

3.4.2 Select sample

The population is comprised of all companies with revenue that fully or partially depends on designing, implementing and maintaining communication enabled business solutions.

A database that includes a comprehensive list of the members of the population does not exist. Thus, one was built for the purpose of this research. The Google search engine was used to identify the members of the population. The following words and phrases were entered in the Google search utility: Communications enabled solutions, Communications- enabled applications, Unified Communications, Communications enabled platforms and Communications and Collaboration platform.

Web search results were validated by examining company websites. A list of companies that relied on communications enabled applications was produced.

To be part of the sample, a company on the list had to meet the following criteria:

- Must have been operating for at least ten years
- Required data must be available on the web

3.4.3 Build database

The third step of the process entailed collecting the data required to scrutinize the business models and populate the structures identified in step 1. These data includes the

data on the key elements of business models as well as the data on cases of customers of CEAs. Data related to communication enabled market offers were also collected.

3.4.4 Develop proposition anchored around the Four Box Model

In this step, the Business Model Canvas (Osterwaldner & Pigneur, 2009) was used to organize the data for each business model in the sample. The researcher then identified what makes the resulting canvases unique and display the results in a Four Box Model (Johnson, Christensen & Kagermann, 2008). Finally, a set of propositions anchored around the business models of large suppliers of CEAs were developed. These propositions highlighted salient attributes of the business models.

3.4.5 Develop propositions anchored around interdependencies of the business model

The data on the sample was organized using the Value proposition model (Johnson, 2010) and the inter-relationships between two key elements of the business models (Customer Value Proposition and Customer Value Segment) were identified. The interdependencies across all market offers were examined and a second set of propositions was developed.

3.4.6 Organize market offers

In the sixth step, the data of market offers was organized to deliver a categorization of CEA market offers (Bailetti, 2009).

3.4.7 Analysis of BM innovation – develop the model

Using Johnson's White Space Within and White Space Beyond frame (Johnson, 2010) a model was developed to illustrate how large suppliers of CEAs improve and innovate their business models.

3.5 Representation of research method

Figure 2 provides a schematic representation of the research method used to complete this thesis. It displays the research steps which were undertaken in this research.

Figure 2- Research roadmap

4 RESULTS

This chapter consists of four sections. Section 4.1 provides the results of the analysis of the business models in the sample. The results of examining interdependencies between key elements of a business model are shown in Section 4.2 Section 4.3 provides a classification of communications enabled market offers. Section 4.4 provides the results of examining how large suppliers of CEAs manage innovation as they grow. Section 4.5 provides the results of the analysis of business model innovation and finally section 4.6 provides a summary of the results.

4.1 Business model analysis

This section is dedicated to provide the results of the analysis of business models at a high level of abstraction.

4.1.1 Sample

A total of 13 business model canvases for the 13 identified communication enabled market offers were included in the sample. Appendix 1 provides the 13 business model canvases included in the sample.

4.1.2 Results

The results of the analysis were obtained using three consecutive steps: (i) used Osterwalder (2010) to model business model components and create business model

canvases, (ii) compared the 13 canvases and (iii) identified the common attributes of business model canvases and used the Four Box Model by Johnson et al. (2008) to abstract and organize the results into a unified model.

Figure 3 provides the attributes and characteristics the researcher found to be common across all the canvases. Figure 3 attempts to illustrate how large suppliers of CEAs create and deliver value to their customers as well as themselves.

Figure 3- A Four Box Model displaying the results of business model analysis

The results suggest that the Customer Value Proposition of large suppliers of CEAs focus on reducing the costs of communications, improving productivity of communication systems and increasing the return of stakeholders' investments.

Results at the high level of abstraction suggests that the profit formulas of the companies in the sample focus on the fees for communications enabled services and that companies generate revenue both from direct sales to the customers and indirect sales through channel partners. Direct sales to the customers lowers the costs of sales, provides more control and strengthens the customer relationships while sales through channel partners brings high upfront fees, low control levels and weak customer interactions. To reduce the risk of the net profit loss as a result of a decline in sales because of the significant upfront fees, large suppliers of CEAs maintain high profit margins through direct sales to their customers. Therefore, their business models trade-offs the disadvantages of the sales through channel partners (high upfront costs) with the advantages of the direct sales (wide profit margins) to sustain the business model in the long run.

The results suggest that the key resources of large suppliers of CEAs include (i) intellectual property, (ii) partnerships, and (iii) platform infrastructure.

Intellectual property is identified as one of the key resources supporting new solutions to technical problems in the CEA domain. Intellectual property in the CEA market includes, but is not limited to, copyrights of any communications enabled contents, trademarks and service marks for every communications enabled solution, software patents and design patents for communications enabled systems and finally technology licences and open specification licences of communications enabled platforms.

Partnerships are key resources in communications enabled business models. The success of the communications enabled products and services relies on the ecosystem of business partners mostly small and medium sized enterprises with a diverse array of government agencies, non-governmental and inter-governmental organizations. The network of partners guide how to use communications enabled technologies to address social needs and help to design, deploy and sustain CEA platforms.

Communication enabled solutions run on top of platform infrastructures. The analysis of data in the sample suggests that large suppliers of CEAs have established strong communications enabled infrastructures at the center of their technology assets. A communications enabled infrastructure enables CEA companies to leverage advanced technologies to ensure superior customer relationships and operational efficiencies. The underlying communications enabled infrastructure are crucial in delivering values such as speed, productivity and ease of use since it empowers customer agents to interact quickly with their clients and to collaborate with colleagues in order to create desirable deals.

Key processes include (i) Infrastructure rationalization; (ii) Infrastructure transformation, and (iii) Application integration and business process enablement.

Infrastructure rationalization refers to all workflows, processes and activities targeted at decreasing costs via standardization. The goal is to eliminate non value added actions and achieve cost reductions along with improved customer satisfaction. Communication enabled environments rely upon standard based infrastructures.

Infrastructure transformation is comprised of activities related to infrastructure upgrades in order to support real-time, multichannel communication capabilities. It includes transformation of IP telephony, soft phone, video/telepresence, instant and messaging and presence implementation.

Application integration activities combine all the desktop, messaging and network transformation components into a seamless unified communication capability. Application integration and business process enablement incorporate activities that embrace unified communication integration, SOA based integration, business application integration and business process automation.

4.1.3 Propositions

The following four propositions were developed:

Proposition 1

CEAs developed and commercialized by large CEA suppliers offer to reduce operating costs, improve productivity and increase return on investment.

Proposition 2

The key resources in the business models of large suppliers of CEAs include: intellectual property, partnerships and platform infrastructure.

Proposition 3

The key processes in the business models of large suppliers of CEAs include: infrastructure rationalization, infrastructure transformation, application integration, and business process enablement.

Proposition 4

Fee for services is the single most important source of revenue for large suppliers of CEAs.

4.2 Analysis of interdependencies

4.2.1 Sample

The sample included 43 cases where information on job to be done, market offer and customer value segment was available for a CEA developed and sold by: Nortel/Avaya ACE, IBM Lotus Sametime platform, Microsoft Lync 2010 platform, and Cisco UC free-boundary platform.

From hundreds of customer case studies of CEA platforms, a sample of 43 cases were chosen to perform the analysis of interdependencies. The selection has been done by random in a way that the sample covers almost all categories of market offers. These cases were drawn from the publicly available customer testimonials. The testimonials provided the required data for analysis of interdependencies. Appendix 2 provides the list of the 43 customer cases used in the analysis. Appendix 3 illustrates the analysis for 14 cases out of the 43. The purpose of showing this data is to explain the intermediate stage.

4.2.2 Results

The analysis of 43 cases shows that different value segments can be provided with the same CVP. This suggests that the customer value proposition is more dependent on the job-to-be-done than the customer type who purchases the CEAs.

Results of the analysis of interdependencies shown in Appendices 2 and 3 indicate that the strength and sustainability of the customer value proposition is strongly related to the clarity and coherence of the identified job-to-be-done, the level of conformity between the job and the market offers and the price of the offerings. The value proposition is considered to be strong if the customer is a recurring customer for the CEA supplier. In other words, if the case of testimony for a customer occurs once during the period of the study, the value proposition is considered as weak. If the customer case returned in the next year(s) with the same job-to-be-done, the value proposition is considered to be strong.

Analysis of 43 cases reveals that the cases which have clearly defined jobs and good match between the jobs and market offers deliver strong customer value propositions (as they return in following years). On the other hand, three cases out of 43 (see Appendix 3) found with not well-defined jobs or with less conformity between the offerings provide weak values to customers (as they occur only once). Vague and unclear job definitions or a weak match between the jobs and the market offerings result in weak value propositions.

The lowest price market offer is not always the best solution. In some cases, the best match is the one with the higher price.

Analysis of the jobs-to-be-done segments the market by the value. Results show that large suppliers of CEAs fulfill jobs in all value segments of the CEA market.

4.2.3 Propositions

The analysis of interdependencies results in the following propositions:

Proposition 5

Customer value proposition is more a function of the job-to-be-done than the specific type of market offer.

Proposition 6

Clearly defined jobs-to-be-done and better match between the jobs-to-be-done and the market offers results in stronger and more sustainable value propositions for customers and partners.

Proposition 7

Cheapest market offers are not always the best solutions when providing a compelling value proposition to customers.

Proposition 8

The CEA market should be segmented based on the value the communications enabled solutions provides the customer. There are customers in every industry sections that are willing to pay for the value that CEAs can provide.

4.3 Classification of communications enabled market offers

In this section, a classification of CEAs is offered. The categorization was based on key values that CEAs provide to the customers (Bailetti, 2009) and the attributes and characteristics of business models.

CEA market offers were organized into three types as follows:

4.3.1 Unified Telephony and Unified Messaging

The first class of CEAs are network converged communications systems that have been delivered as closed proprietary silos of technology for each type of communications-telephony, fax, messaging, etc. This category includes Unified Telephony and Unified Messaging systems.

Unified Telephony consolidates telephony and data networks onto a single IP network. Simplicity of centralized network management, tighter security, improved system failure

recovery and enhanced phone services are supporting benefits and motivating factors for deploying unified telephony.

Unified Messaging (UM) signifies the technology that combines voicemail, email and fax into a single interface in order to provide an easy access to all of one's messages. The goal of deploying UM solutions commonly is to enhance business productivity meanwhile decreasing communication issues.

4.3.2 Unified Communications and CEBP

Second category of CEAs embodied systems of convergence with applications. This type of platform integrates real-time communication modes (such as presence, telephony, A/V conferencing, etc) with near real-time communication services (IM, email and voicemail). This class covers unified communication systems and communication enabled business processes.

Unified Communications enables faster and easier deployment of communications capabilities such as voice, video, messaging, and presence. As a result, productivity and business agility can be increased.

UC value propositions:

- Provide highly secure, reliable, scalable communications that take advantage of your LAN and WAN

- Improve employee flexibility and productivity with the full range of Cisco Unified Communications and third-party applications
- Take advantage of a wide range of Session Initiation Protocol (SIP)-based capabilities

Communication enabled business process (CEBP)¹ integrates unified communications function and communications tools into enterprise operations, business processes and applications. CEBP is the growing type of UC applications which provide much higher return as they improve an enterprise business methods in measureable, repeatable ways.

Key drivers for CEBP investments include optimizing utilization of resources, accelerate transactions, improve contact success, automate communication processes and enhance collaboration effectiveness.

¹ The term “CEBP” was coined by Gartner in 2003, summarized as “Integrating communications and collaboration with business processes offers opportunities for considerable benefits. The methods for developing these applications matured along with unified communication solutions.

4.3.3 Communication and collaboration platform/Communication-enabled platform

Communications enabled platforms represent a class of market offers where multiple modes of business communications are seamlessly integrated.

Integration (unification) of all communications applications, processes and operations inside a single platform provides benefits and capabilities that extend beyond the infrastructure to any communication device that a user may utilize. The platforms delivers communications integrated environment that works across multi vendor infrastructure providing a number of key enablers for business process acceleration. Differentiation value points of this category include the ability to reduce human delays, a bottleneck to timely completion of business processes. From the technical perspective, distinguishing point of difference is the delivery of the communications enabled services within a SOA framework.

The results of the categorization of communications enabled market offers are provided in the following table.

	Market offers	Sub market offers	
	Avaya Unified Messaging	Aura Messaging, Modular Messaging, Call Pillot, Hospitality Messaging,	
	Avaya Unified Communications	Aura Communication Manager, Aura Application Enablement, Aura Presence,	

Avaya	Avaya Unified Communications	Integrated Management, Aura Session Border Controller, Aura System Manager, Aura Communication Manager Messaging, Aura Media, Aura System Platform, Aura Collaboration Server	
	Nortel/Avaya Agile Communication Environnement	ACE Office and Web Browser Add-In, Multi-Vendor Application Integration, Hot Desking, Mobile Cost Optimizer, Corporate Portal, ACE IBM Sametime Integration, Event Response Manager, Mobile Business Applications, Message Drop and Message Blast API's, Contact Center Integration	
IBM	IBM Lotus Sametime Unified Telephony		
	IBM Lotus Sametime Converged Communications	Converged Communications for Lotus Unified Telephony, Converged Communications for SIP infrastructure, Strategy and Assessment for UC as a Service (UCaaS)	
	IBM Sametime Unified Communication and Collaboration Environment	Application Integration, Communication enabled business processes, Standard based telephony integration	
	Cisco Unified Messaging	Cisco Unity, Cisco Unity Connection, Cisco Unity Express	
	Cisco Unified	Unified Communications Applications, IP	

Cisco	Communications	Telephony, Unified Contact Center Enterprise, Unified Contact Center Express, Unified Customer Voice Portal, Unified Expert Advisor, Unified Intelligence Suite, Unified Provisioning Manager, Unified Operations Manager, Unified Service Monitor, Unified Service Statistics Manager	
	Cisco Unified Application Integration	Cisco Unified Application Server, Cisco Unified Application Designer, Cisco Media Engine	
	Collaboration enabled business transformation platform		
Microsoft	Microsoft Unified Messaging		
	Microsoft Unified Communications	Microsoft Office Communications Server (OCS), Microsoft Exchange, Microsoft Office Communicator, OCS Speech Server, Microsoft Live Communications Server, Microsoft Office	
	Communications enabled business process platform	Instant Messaging and Presence, Audio/Video and Web Conferencing, Mobility, Enterprise Voice, Group Chat	

Table 2- Categorization of communications enabled market offers

Table 2 provides a summary of the categorization of CEA market offers developed by large suppliers: Nortel/Avaya, IBM, Cisco, and Microsoft. For more details, see Appendix 8.

4.4 Analysis of shifts in the basis of competition

4.4.1 Sample

The sample includes data on business models for the four large suppliers of CEAs: Nortel/Avaya ACE, IBM Lotus Sametime platform, Microsoft Lync 2010 platform, and Cisco UC free-boundary platform.

The data includes information on the different types of business models that these companies used to respond to environmental changes over time.

4.4.2 Results

The analysis was performed using the White Space Within advanced by Johnson (2010). The frame is used to investigate how large suppliers of CEAs in the study, manage innovation to respond to shifts in the basis of the competition. Appendix 4 provides the data used to produce results provided in this section.

The results of the analysis can be summarized as follows:

Figure 4- Anticipated growth curve in communications enablement

Figure 4 illustrates a view of competition in the CEA market over time.

The results show that large suppliers of communication enabled solutions apply *product innovation* to compete on *functionality* while they were developing the first generations of their CEAs: Unified Messaging and Unified Telephony. As soon as the basis of the competition shifts to *reliability*, communication enabled solutions moved to the stage of convergence with applications – Unified Communications and Communications Enabled Business Processes (CEBP). At this stage companies utilize *process innovation* to cope

with the competition based on reliability. In the final stage the basis of the competition shifts to *Convenience*. At this stage, large suppliers of CEAs innovate their business models to satisfy new customer value propositions in a Multi-sided Environment.

The growth curve in communications enabled solutions illustrates the fact that early generation of communications enabled systems² were supporting voice and data separately and business applications were disconnected³. Later on, voice, video, and data streams converged into a single IP network known as Unified Messaging and Unified Telephony which delivered cost savings and simplified IT management. Considering this stage as the first, the basis of the competition is based of functionality where companies introduce additional features and functionalities, competing by innovating their products and services while reducing costs through greater efficiency. However, since applications remained isolated, next generation of CEAs emerged as convergence with applications which integrate conferencing, email, instant messaging, and presence into a single network called Unified Communications. In addition to cost reduction benefits that organizations achieve with UC, there is a significant effect on productivity and reliability gains. At the time of the shift to convenience, a new set of communication enabled

² Early generation of communications enabled systems (during the 1990's) were infrastructural, composed of disparate systems which Private Branch Exchange (PBX) systems were proprietary.

³ As a result of this non-integrity, early communication enabled platforms had minimal effect on the organization and were deficient in providing additional value

capabilities are required to support the new necessity for intelligent collaboration. The new generation of CEAs - Unified Communications and Collaboration (UCC) or communication enabled environments, are multi-vendor communications systems, focusing on leveraging SOA and web service to deliver communication enabled solutions and business processes across enterprise and carriers (cross-domain).

4.5 Analysis of shifts in problem solving

4.5.1 Sample

Sample of the analysis in this section are the 13 business model canvases that were created in section 4.1.

4.5.2 Results

The white space beyond frame (Johnson, 2010) was used to perform the analysis. Appendix 5 provides the abstractions used for the purpose of this analysis.

Three types of business models were identified for large suppliers of CEAs: (i) Solution based business models, (ii) Value adding process business models and (iii) Multi-sided platform business models.

I. Solution based business model

Large suppliers of CEAs adopt solution based business models⁴ in developing their Unified Messaging and Unified Telephony solutions to increase productivity and to reduce the communication issues in communications systems. Such business models provide customized unified messaging/unified telephony solutions to unique problems in messaging/telephony network infrastructures. Payments in solution based business models are in the form of fee for services. Since, the liability of the outcomes are low and the business model tends to have high margins, high overhead costs and low resource velocity. Figure 5 displays a solution based business model adopted by large suppliers of CEAs at their primary stage of problem solving. The model emphasizes that the focus of the customer value proposition is to reduce costs through providing overall unified communications enabled solutions. Key processes in this type of business models mainly includes converged networks where telephony, video and data communication services are integrated into one single network.

⁴ Solution based business models deliver value through the intuition and analytical problem solving skills of experts to diagnose the cause of complicated problems

Figure 5- Solution based business models

II. Value adding process business models

The second identified business model type are Value Adding Process (VAP) business models. After definitive diagnosis and problem solving for typical problems (increase productivity and reduce costs) in solution based business models, VAP procedures are being applied in the second stage of growth in communications enablement – Unified Communications. At this stage, problem solving approach shifts to recognition of patterns in cause and effects of the

problem and solutions are more structured. Given the increased liability⁵ and predictability, such business models make money on rendering the UC solutions. Consequently, this type of business models tend to posses lower margins, lower overhead and at the other side higher resource velocity than solution based.

Figure 6 represents a VAP business model adopted by large suppliers of CEAs at their second stage of problem solving continuum.

Figure 6- Value adding process business models

⁵ This type of business model charges for the output of the problem solving processes and is able to deliver the outcome in repeatable and controllable processes, thus, the outcomes are more liable and can be guaranteed.

III. Multi-sided platform business models

The third business model type, multi-sided platform, provides a backbone ecosystem within which all players can exchange products/services, share information and collaboratively solve problems. Large suppliers of CEAs adopt such business models at their final stage(s) of their growth in communications enablement (section 4.4). This type of business models make money through transaction fees, advertising or subscriptions depending on various levels of participations in the network. Such models make knowledge more accessible by connecting parties who have incomplete but complementary knowledge. Within such a network, the problem solving knowledge process would enhance, shifting knowledge to pattern recognition and rule based decision making quickly and in a cost effective manner.

Figure 7 displays a multi-sided platform business model adopted by large suppliers of CEAs at their final stage of problem solving. The model indicates the focus of customer value proposition on creating a multi-sided platform to connect all stakeholders to collaboratively reduce system delays. Key processes in such business models includes business process transformation and multimedia collaboration. Multimedia collaboration processes refer to all activities required to develop technologies and business processes for communication systems via audio, video, data, across person-to-person or group-to-group.

Figure 7- Multi-sided platform business models

4.6 Key findings

4.6.1 A model for business model innovation

Figure 8 is a model developed to illustrate how large suppliers of CEAs improve and innovate their business models. The model highlights the contribution of two major drivers of business model innovation: shifts in the basis of the competition on the horizontal axis and shifts in the problem solving continuum on the vertical.

The developed model applies the White Space frame (Johnson, 2010) to the public information for large suppliers of CEAs that is available over the Internet. The model attempts to position three business models types that these incumbents adopt at critical points in their growth curve. Appendix 6 describes the business model for innovation in large suppliers of CEAs.

Figure 8- A new model for business model innovation

4.6.2 Summary of results

- I. The analysis of business models provides a top level view of how large suppliers of CEAs do business. The results identify unique attributes of large suppliers of CEAs business models.
- II. The analysis of interdependencies between key elements of CEA business models complements the analysis of business model using the Four Box Model. The incremental insights it provides includes how the building blocks of the business models of large suppliers of CEAs work together. Results suggest that the better understanding of the jobs that need to be done for the customers results in creating more compelling customer value propositions.
- III. This research yields a classification of communications enabled market offers which classifies CEAs in terms of the value that they provide to get the job done for the customers.
- IV. The results of analysis of business model innovation in large suppliers of CEAs shows that opportunities for growth and renewal emerges whenever the basis of the competition shifts or the problem solving method changes. Business model

innovation occurs by the time the basis of the competition shifts to convenience or the problem solving continuum shifts to rule-based method.

5 DISCUSSION OF RESULTS

This chapter is organized into two sections. Section 5.1 discusses the results presented in chapter 4. Section 5.2 links the results of this research with the literature reviewed in Chapter 2.

5.1 Insights gained while carrying out the research

5.1.1 Business model canvas

The Business Model Canvas frame advanced by Osterwaldner and Pigneur (2009) was used to examine business models of a dozen market offers in the context of the CEA domain. The frame appears well suited to describe and understand a high-level view of the CEA business models.

Application of the frame suggests that it needs to be extended in four areas. First, before applying the canvas two building blocks need to be revised: Customer Value Proposition and Customer Segments.

Customer Value Propositions should be defined in terms of points of differences instead of list of benefits. This research suggests using the CVP definition provided by Anderson, Narus and Rossum (2006).

The customer segment building block should also be revised. Segmentation should be performed based on value delivered instead of demographic attributes of the customers.

Suggest that Customer Segments should be renamed Customer Value Segments for the purpose of clarifying the basis for segmentation.

Second, the frame needs to be extended to be able to differentiate all types of business models. In some cases, two different business models appears identical in Canvas frame.

Third, the frame works well in the case of single-side platforms. However, it can not explain how a platform delivers value to multiple sides. In essence, the Business Model canvas is limited to the examination of business models for platforms that deliver value to one side.

Fourth, the Business Model Canvas should be extended to capture information at a lower level of detail, including interdependencies.

5.1.2 Johnson's White Space frame

The model proposed in Figure 8 in Section 4.6.1 integrates two sides of the white space frame (white space within and white space beyond) to examine business model innovation in the CEA domain.

The model in Figure 8 positions three different types of business and identifies three different types of innovation which large suppliers of CEAs adopt to respond to changes in the competition at different stages of their growth.

The model can be applied to other domains to predict and illustrate the patterns of business model innovation. The behavior of the model might be slightly different when applied to different domains. However, the key attributes of the model are expected to remain unchanged.

The results from this research do not provide enough evidence to designate the innovation as the third key driver of business model innovation. The role of the innovation as the third key driver in business model innovation is not clear.

5.2 Link with the literature

5.2.1 Analysis of business models

Zott, Amit and Massa (2011) review the business model literature and conclude that the business model is emerging as a new unit of analysis and that business models emphasize a holistic approach to explain how firms do business. This research uses the business model as a unit of analysis in the CEA domain and explains how firms do business using system-level frames.

Johnson, Christensen and Kagermann (2008) advanced the Four Box Business Model framework that captures the elements of a business model, i.e., the elements that are central to creating and delivering value to customers and the firm. Application of this frame to better understand the business models of large suppliers of CEAs identified the constituent parts of CEA business models. The frame can help top managers discover what they need to do to capitalize on a new opportunity.

Johnson et al. (2008) and Johnson (2010) emphasizes that a clear customer value proposition is required to anchor a business model. For each business model attached to an identified communications enabled market offer in the sample, a compelling customer value propositions was defined.

5.2.2 Analysis of interdependencies

Johnson (2010) asserts that the jobs-to-be-done and the market offer define the customer value proposition. This research uses this assertion to develop customer value propositions.

Christensen (2003) notes that customers hire products to do jobs and that these jobs can be used to segment markets. This research attempted to segment the CEA market based on the jobs that need to be done rather than traditional demographic dimensions. Christensen (2003) believes segmenting the market along demographic or psychographic lines provides information on individual customers. However, it leads to a rush towards undifferentiated one size fits all products that perform poorly any specific jobs that customers want them to do. It also provides an applicable frame that can be used in all industries for segmentation purposes.

Johnson (2010) determined three key metrics which affects the overall value of a customer value proposition: (i) The importance of the job-to-be-done to the customers (ii) The levels of satisfaction of the customers with current solutions and (iii) How well the offerings with lower price (generally) get the jobs done relative to the alternative offerings. Although Johnson (2010) explicitly defined the metrics, it is not clear how the importance of the job can be measured. He articulates the link between the level of satisfaction and the match between the jobs and the market offers.

The propositions developed in this research are based on the analysis of the jobs-to-be-done. Proposition 5⁶ supports the influence of the first metric by identifying stronger contribution of the jobs compared to the offerings itself. The second metric is supported by proposition 6 expressing that the more clearly defined jobs-to-be-done and the better match between the jobs and the market offers results in more sustainable value propositions.

Johnson (2010) explains the effect of the third metric generally as the lower the offering's price, the greater the overall value generated for the customer. The public data that is available does not allow us to say much about this assertion in the CEA domain.. Examination of the sample price quotes suggests that the cheapest market offers are not always the best solutions when providing a compelling value proposition to customers.

This research finds evidence that there are customers for CEAs in every industry segment. Therefore, segmenting the market based on job-to-be-done is probably more helpful than segmenting the market by industry attributes.

⁶ Proposition 5: Customer value proposition is more interdependent to the job-to-be-done than the specific type of market offers.

5.2.3 Analysis of business model innovation

5.2.3.1 Analysis of shift in the basis of the competition

Moore (1991) and Christensen (1997) stated that companies differentiate their products and services on more than one level of performance. This research identifies three levels within the growth curve for large suppliers of CEAs. These three levels are: Functionality, Reliability and Convenience.

Johnson (2010) believes that opportunities within the white space often relates to predictable shifts in an industry's basis of the competition which he describes as the characteristics of the market offers for which customers are paying. Applying white space within frame, this research identifies which type of the innovation (product, process or business model innovation) are employed to move from one stage to another.

Johnson's (2010) frame of white space within indicates that once the basis of the competition shifts to convenience or cost, business model innovation comes into play. The results of analysis of the shifts in the basis of the competition in this research supports this reality with the exception that in CEA market, there is a inertia for large suppliers of CEAs to keep their business models at low cost. Changes in business models can be observed anytime the basis of competition shifts. In the CEA market, once the basis of the competition shifts to convenience, large suppliers of CEA move to compete in terms of business model innovation.

5.2.3.2 Analysis of shifts in the problem solving continuum

Moore (2005), Stabell and Fjeldstad (1998), Christensen (2009) and Johnson (2010) have developed a typology of business models. All frameworks provide basic business model types with slightly differences. Table 4 illuminates the variances in the approach, terminology and the underlying logic in categorization.

	Approach in categorization	Business Model types		Terminology	Distinction
Moore, (2005)	Based on how to respond to demands in every dimensions of Value Creation	Complex Systems Model <ul style="list-style-type: none"> - Organized around target customers as competitive focal point - Invests in a solution sales organization to build long term, trust based relationships - Supported by a layer of consulting and integration services - The delivered solution is the company's best response to customer's need - The architecture of the solution is modular with possibility of the third party collaboration - Technology Architecture which provides the infrastructure for elements to work together - Solution generates in an 	Value Operations Model <ul style="list-style-type: none"> - Uses Technology to create differentiation at scale - The goal is to spin out a differentiated set of offers in high volume and low cost - The model exploits the economy of scale through shared infrastructure - Uses a high volume, low touch distribution channels to enable customers to buy - Customers are attracted to the offer by Brand and Advertising - Systemizing transactions to high volume customers 	Organizational Models	Contrasting economic formulas.

		integrated platform - Every solution works with some Legacy Systems				
Stabell and Fjeldstad (1998)	Value Configuration analysis approach	Value Chain Model - The logic of value creation is to transform inputs into products - Primary activities include Inbound and Outbound logistics, Operations, Marketing and Service - Primary activities are pooled and sequential - Key cost drivers are Scale and Capacity Utilization - Interlinked value chains constitute the value system structure	Value Shop Model - The logic of value creation is to resolve customer problems - Primary activities include Problem-finding and acquisition, Problem solving, Choice, Execution, Control/evaluation - Primary activities are pooled, sequential and reciprocal - Reputation is the key value driver - Referred shops constitute the value system structure	Value Network Model - The logic of value creation is to link customers - Primary activities include Network promotion and contact management, Service provisioning, infrastructure operation - Primary activities are pooled and reciprocal - Scale and Capacity Utilization are key cost drivers are - Layered and interconnected networks constitute the value system structure	Value Configuration Model	Value Creation Logic and logic of coordination

Christensen (2009)	Models of disruption	Solution shops <ul style="list-style-type: none"> - Models to solve unstructured problems - Payments in the form of fee for services - No guarantee on total costs and ultimate outcomes 	Value-Adding Process <ul style="list-style-type: none"> - Transform incomplete inputs to complete outputs through a definitive diagnosis - Overhead costs drops significantly - Fees for outputs - Results are guaranteed as the outcomes are embedded in repeatable processes 	Facilitated networks <ul style="list-style-type: none"> - The model where people exchange things and learn from each other 	Disruptive Business Models	Disruptive business models
Johnson (2010)	Problem solving methods	Solution shops <ul style="list-style-type: none"> - Models to solve unstructured problems through intuition and analytical skills 	Value-Adding Process <ul style="list-style-type: none"> - Provide scaled products and services - Pattern recognition problem solving 	Facilitated networks <ul style="list-style-type: none"> - Connect people in a system where they can share, buy and sell goods and information with other participants 	Business models	Business model types

		<ul style="list-style-type: none"> - Payments in the form of fee for services - No guarantee on total costs and ultimate outcomes - Results of problem solving depends on many factors beyond the correctness of the diagnosis 	<ul style="list-style-type: none"> - Lower overhead costs and lower margins - Revenue model is based on charging fees for outcomes - Increased liability and predictability due to guaranteed results 	<ul style="list-style-type: none"> - Revenue model is subscription and advertising based - Key processes and activities includes the size and composition of the customers and the IT system which enables connectivity 		
--	--	---	--	---	--	--

Table 3- Identified Business model archetypes

Moore (2005) identified two different types of models based on how each model respond to demands through the seven⁷ phases of the value chain. The two organization models: Complex systems model and Volume operations model are distinct in their contrasting economic formulas. Although the framework clearly identified the key elements of the models, the key building blocks in two models are rather different which makes understanding the structure of the models difficult.

Stabell and Fjeldstad (1998) has identified three value configuration models of Value Chain, Value Shop and Value Network based on the value creation logic. Primary technology, Primary and secondary activity categories, Main interactivity relationship logic, activity interdependencies, cost and value drivers and business value system structure constitute the distinctive elements between models. Although the three models are the principal reference point, the focus is to translate a value configuration analysis to a competitive strategy, rather than identifying different business model archetypes. The framework also lacks of differentiation in competitive and costs, value drivers and secondary activity categories.

Christensen (2009) identified three different business model in healthcare industry by observing how care centers can disrupt their underlying technologies, processes and

⁷ The seven phases of the classic value chain are Research, Design, Source, Manufacture, Market, Sell and Service

ultimately business models: Solution shops, Value adding processes and Facilitated networks. The first criticism with Christensen's (2009) is the limitation of the sample to healthcare industry. secondly, although he illustrated the mechanism of operation of the first two business models explicitly, it's not clear how facilitated network model operates. And finally, the fact that the structure of the models are not explained in his framework.

Johnson (2010) determined three types of business models similar to Christensen, with different distinction in his classification. His approach in categorization initiates a construct for business model innovation based on the problem solving methodology. The only restriction is the structure of the facilitated network business model which is not explained, although the mechanism of the operation of the model has been discussed.

This research uses Johnson's basis of the categorization – problem solving approach – to identify three types of business models in large suppliers of CEAs: Solution-based, Value added processes and Multi-sided platform business models. The results show minor changes in the attributes of the solution shops and value added processes models identified by Johnson (2010), as a results of the influence of the CEA domain on characteristics of the business models. Facilitated network business model has been upgraded with the concept of multi-sided platforms to remove the limitations of the approach in demonstrating the third type of the business models. The results of this research also determines the location of the identified business models on the CEA

growth curve which adds more power to the framework when applying to different domains, as it can uncover more details of how the business model provides value for the customers and the company itself.

6 CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

This chapter is organized into three sections. Section 6.1 provides the conclusions of the research. Section 6.2 identifies the limitations of the research. Section 6.3 provides recommendations for future research.

6.1 Conclusions

This research examined how five large companies that develop communications enabled solutions generate revenue from CEAs. Previous studies in different domains have identified different ways companies do business analyzing market offers. This is the first study on CEAs that explores how companies do business by analyzing key elements of a business model.

The first conclusion is that the analysis of business models requires an understanding of two aspects: what are the key elements of a business model and how its key elements work together to deliver value for customers.

The second conclusion is that a better vocabulary for business models is needed. A better vocabulary can accelerate decisions about how to do business in the CEA domain and how to innovate the current ways used to do business. In this thesis we used conceptual representations of business models that focused on key building blocks and their inter-

relationships. We conclude that use of a generic frame for business models requires modification by people who are very familiar with the domain.

The third conclusion is that two features make business models of large suppliers of CEA distinctive. First, value propositions that highlight cost reductions, enhanced productivity and increased ROI with a revenue model based on charging fees for communications enabled services and key resources and processes involving intellectual properties and platform partnerships.

The second distinctive feature of CEA business models is the fact that large suppliers of CEAs follow a pattern in their transformational growth and renewal. The pattern suggests that: (i) Large suppliers of CEAs improve their business models every time the basis of competition changes (from functionality to reliability) or the problem solving method shifts (from unstructured problem solving to pattern recognition); (ii) Large suppliers of CEAs innovate their business model once the basis for competition shifts from reliability to convenience or the problem solving method shifts from pattern recognition to rule based decision making; and (iii) To generate revenue from the next generation of CEAs, large suppliers of CEAs innovate their business models to multi-sided platform business models: an ecosystem aiming at removing process friction through minimizing human and system latencies, contributing to lean business workflows.

6.2 Limitations

The research has at least two limitations:

The first limitation of this research is that it uses secondary sources of data. The research is not based on in depth interviews with representatives of sample companies which is due to time and resource constraints

The second limitation is lack of knowledge in communications enablement domain since the era is new. Very few studies and literatures are available in this context which makes it hard to perform a research upon.

6.3 Opportunities for future research

The following suggestions are made for future research:

- Examine the business models in CEA start-ups. For this purpose, it is required to collect data from the primary sources (e.g. interview with founders and top managers) and to use analysis tools that can determine how key elements of the business models interact with each other to provide value. Business Dynamics can provide the required tools and methodologies to determine the what causes what and in what circumstances in a system of business model elements.
- Explore how multi-sided approach changes the way CEA companies can do business. The multi-sided approach (view) of CEA platform opens up new ways of creating wealth and generating revenue in today's economy structures. How CEA companies adopt and deploy such business models?

REFERENCES

- Afuah, A. & Tucci, C. 2001. *Internet business models and strategies*. Boston: McGraw Hill.
- Amit, R. & Zott, C. 2001. Value creation in e-business. *Strategic Management Journal*, 22(6/7): 493-520.
- Anthony, S.D., Erying, M. & Gibson, L. 2006. Mapping your innovation strategy. *Harvard Business Review*, 84(5): 104-113.
- Armstrong, M. 2002. Competition in two-sided markets. Mimeo, University College London. Revised 2004.
- Armstrong, M. 2006. Competition in two sided markets. *RAND Journal of Economics*, 37(3): 668-691.
- Armstrong, M., Wright, J. 2007. Two sided markets, competitive bottlenecks and exclusive contracts. *Economic Theory*, 32: 353-380.
- Anderson, J.C., Narus, J.A. & Rossum, W.V. 2006. Customer value propositions in business Markets. *Harvard Business Review*, 84(3):90-99.
- Bailetti, A.J. 2009. TTMG 5001: Profile for Communications Enabled Applications in Canada's Capital Region. Course notes, Technology Innovation Management (TIM) program. Carleton University
- Bailetti, A.J. 2010. TTMG 5003: TIM program lecture notes. Carleton University.
- Baresi, L., Heckel, R., Thone, S., & Varro, D. 2006. Style based modeling and refinement of service oriented architectures. *Software and System Modeling*, 5(2): 187-207.

Blackman, C. (1998). Convergence between telecommunications and other media: How should regulation adapt? *Telecommunications Policy*, 22(3): 163-170.

Boudreau, K. 2007. *Does opening a platform stimulate innovation? The effect on systematic and modular innovations*. SSRN 913402.

Brynjolfsson, E. & Kemerer, C.F. 1996. Network externalities in microcomputer software: An econometric analysis of the spreadsheet market. *Management Science*, 42(12): 1627-1647.

Boudreau, K. J. & Lakhani, K. R. 2009. How to manage outside innovation. *MIT Sloan Management Review*, 50(4): 69-76.

Caillaud, B. & Jullien, B. 2003. Chicken and egg: Competition among intermediation service providers. *RAND Journal of Economics*, 34(2): 309-328.

Chesbrough, H.W. 2006. *Open business models: How to thrive in the innovation landscape*. Boston: Harvard Business School Press.

Chesbrough, H. W. & German, A. R. 2009. How open innovation can help you cope in lean times. *Harvard Business Review*, 87(12): 68-76.

Chesbrough, H. & Rosenbloom, R.S. 2002. The role of business model in capturing value from innovation: Evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change*, 11(3): 529-555.

Christensen, C.M. & Raynor, M.E. 2003. *The innovator's solution: Creating and sustaining successful growth*. Boston: Harvard Business School Press.

- Eisenmann, T.R., Parker, G. & Van Alstyne, M.W. 2008. *Opening platforms: How when and why?* SSRN 1264012.
- Evans, D. 2003. The antitrust economics of multi-sided platform markets. *Yale Journal of Regulation* 20: 325–382.
- Evans, D.S., Hagiu, A., & Schmalensee, R. 2006. *Invisible engines: How software platforms drive innovation and transform industries*. The MIT Press.
- Evans, D.S. & Schmalensee, R. 2007. *Catalyst code: The strategies behind the world's most dynamic companies*. Boston: Harvard Business School Press.
- Gallaughier, J.M. & Wang, Y.M. 2002. Understanding network effects in software markets: Evidence from web server pricing. *MIS Quarterly*, 26(4): 303-327.
- Gandal, N. 1995. Competing compatibility standards and network externalities in the PC software market. *Review of Economics and Statistics*, 77(4): 599-608.
- Gawer, A., & Cusumano, M.A. 2002. *Platform Leadership: How Intel, Microsoft and Cisco drive industry innovation*. Boston: Harvard Business School Press.
- Gawer, A. & Henderson, R. 2007. Platform owner entry and innovation in complementary markets: evidence from Intel. *Journal of Economics and Management Strategy*, 16(1): 1-34.
- Gordijn, J., Akkermans, J. & Vliet, J. V. 2001. Designing and evaluating e-business models. *IEEE Intelligent Systems*, 16(4): 11-17.

- Hedman, J. & Kalling, T. 2001. *The business model: A mean to understand the business context of information and communication technology*. Institute of Economic Research, School of Economics and Management, Lund Universitet, Lund, Sweden.
- Iansiti, M. & Levien, R. 2004. *The keystone advantage: What the new dynamics of business ecosystems mean for strategy, innovation, and sustainability*. Boston: Harvard Business School Press.
- Johnson, Mark W., Christensen, Clayton M. & Kagermann, Henning. 2008. *Reinventing your Business Model*. *Harvard Business Review*, 86(12): 50-59.
- Johnson, M. W. 2010. *Seizing the white space: Business model innovation for growth and renewal*. Boston: Harvard Business School Press.
- Jullien, B. 2004. Two-sided markets and electronic intermediaries. *CESifo Economic Studies*, 51(2-3): 233-260.
- Kanaparti, S. 2008. A distributer SOA model for unified communication services. IEEE International Conference on Web Services.
- Lee, D., Mendelson, H. 2008. Divide and conquer: Competing with free technology under network effects. *Production and Operations Management*, 17(1): 12-28.
- Linder, J. & Cantrell, S. 2000. *Changing business models: Surveying the Landscape*. Accenture Institute for Strategic Change.
- Liu, C.Z., Kemerer, C.F., Slaughter, S., & Smith, M.D. 2008. *Standards competition in the presence of digital conversion technology: An empirical analysis of the flash memory card market*. SSRN 1021352.

- Magretta, J. 2002. Why business models matter. *Harvard Business Review*, 80(5): 86-92.
- Mahadevan, B. 2000. Business models for Internet-based e-commerce: An anatomy. *California Management Review*, 42(4): 55-61.
- Mantena, R., Sankaranarayanan, R, & Viswanathan, R. 2007. *Exclusive licensing in complementary network industries*. SSRN 979330.
- Nortel Technical Journal. 2007. The future made simple. May.
http://www.nortel.com/corporate/news/collateral/future_made_simple_issue_may2007.pdf
 f. Accessed January 2010.
- Osterwalder, A., Ben Lagha, S., & Pigneur, Y. 2002. An Ontology for e-business models. *European Journal of Operational Research*. Proc. of the 15th e-commerce conference. Bled, Slovenia.
- Osterwalder, A. & Pigneur, Y. 2009. *Business model generation: A handbook for visionaries, game changers and challengers*. Hoboken, NJ: John Wiley & Sons, Inc.
- Parker, G. & Van Alstyne, M.W. 2005. Two sided network effects: A theory of information product design. *Management Science*, 51(10): 1494-1504.
- Parker, G. & Van Alstyne, M.W. 2008. *Innovation, openness, and platform control*. Social Science Research Network. SSRN 1079712.
- Petrovic, O., Kittle, C. & Teksten, R.D. 2001. *Developing business models for e-Business*. SSRN 1658505.
- Porter, M. 2001. Strategy and the Internet. *Harvard Business Review*, 79(3): 62-78.

- Rake, J., Holschke, O., Offermann, P., & Bub, U. 2009. Communication-enabled business processes as a service. *13th International Conference on Intelligence in Next Generation Networks*. ICIN 2009.
- Rappa, M. 2003. *Managing the digital enterprise: Business models on the web*. North Caroline State University.
- Rochet, J.C. & Tirole, J. 2001. Platform Competition in Two-Sided Markets. Mimeo, IDEI.
- Rochet, J.C., Tirole, J. 2003. Platform Competition in Two-Sided Markets. *Journal of the European Economic Association*, 1: 990-1029.
- Rochet, J.C. & Tirole, J. 2004. Two-sided markets: An overview. Mimeo, IDEI University of Toulouse. January.
- Rybczynski, T., & Shetty, M. 2005. Unified communications: where the world is heading. *Financial Executive*, 21: 31-33.
- Timmers, P. 1998. Business Models for Electronic Markets. *Journal of Electronic Markets*, 8 (2): 3-8.
- Tapscott, D., Lowi, A. & Ticoll, D. 2000. *Digital capital: Harnessing the power of business webs*. Boston: Harvard Business School Press.
- Treacy, M. & Sims, J. 2004. Take command of your growth. *Harvard Business Review*, 82(4): 127-133.
- Venkatachalam, L., Dhara, K.K., Krishnaswamy, V., & Vernick, M. 2008. Communication enabled web applications: the evolution of computer telephony

integration. *Proceedings of the third international conference on communications, IEEE COMSWARE 2008*. June: 275-278.

Venkatraman, N. & Henderson, J. C. 2008. Four vectors of business model innovation: Value capture in network era. In D. Pantaleo & N. Pal (Eds.), *From Strategy to Execution*: 259-280. Berlin: Springer-Verlag.

Weill, P. & Vitale, M.R. 2001. *Place to space: Migrating to e-business models*. Boston: Harvard Business School Press.

West, J. 2003. How open is open enough? Melding proprietary and open source platform strategies. *Research Policy*, 32(7): 1259-1285.

Zhu, F. & Iansiti, M. 2009. *Entry into platform-based markets*. Marshall School of Business, USC.

Zook, C. 2007. Finding your next core business. *Harvard Business Review*. 85(4): 66-75.

Zott, C., R. Amit & L. Massa. 2011. The business model: Recent development and future research. *Journal of Management*. 37(4): 1019-1042.

Appendix 1- 13 business model canvases

Key Partners	Key Activities	Customer Value Proposition	Customer Relationship	Customer Value Segment
1. Channel partners: Avatel technologies, Relational Technologies Solutions, Verizon Business and Vision Technologies 2. Technology partners: Microsoft 3. System integrators and Service providers: Accenture, AT&T, HP, IBM, Orange Business Services and Skype 4. Consultants	Developing CE solutions Application integration Training, maintenance and support Managing partnerships	1. Improve productivity, collaboration and competitiveness 2. Reduce cost and time to market 3. Drive fast ROI and reduce development time up to 80% 4. Provide multi- vendor interoperability and richer user experience	1. Online P/S documentation 2. Self Service and Support Contact Service 3. E-notifications and RSS feeds 4. Blog, Forum and Social Media 5. Customized CRM Applications	Finance Healthcare Hospitality Manufacturing Utility
	Key Resources		Channels	
	IT and telecomm infrastructure Software application Communication systems Proprietary knowledge		1. Online marketing campaign 2. Sales force 3. Channel partners	
Cost Structure		Revenue Stream		
Cost of sales of P/S Research and Development General and administrative Cost of service		Communication solutions Global services Product support services Consulting and system integration		

Figure 9 - A business model canvas for Nortel/Avaya ACE

Key Partners 1. Channel partners: Avatel technologies, Relational Technologies Solutions, Verizon Business and Vision Technologies 2. Technology partners: Microsoft 3. System integrators and Service providers: Accenture, AT&T, HP, IBM, Orange Business Services and Skype 4. Consultants	Key Activities Developing UC solutions Application integration Maintenance and support Managing partnerships Key Resources IT and telecomm infrastructure Software applications Proprietary knowledge	Customer Value Proposition 1. Reduce the inconvenience and delays of contacting efforts 2. Increase control over workflows 3. Reduce costs and complexity of supporting many different productivity tools	Customer Relationship 1. Online P/S documentation 2. Self Service and Support Contact Service 3. Blog, Forum and Social Media 4. E-notifications and RSS feeds Channels 1. Online marketing campaign 2. Sales force 3. Channel partners	Customer Value Segment Finance Healthcare Hospitality Manufacturing Utility
Cost Structure Cost of sales of P/S Research and Development General and administrative Cost of services			Revenue Stream Communication solutions Global services Product support services Consulting and system integration	

Figure 10 - A business model canvas for Avaya Unified Communications

Key Partners 1. Channel partners: Avatel technologies, Relational Technologies Solutions, Verizon Business and Vision Technologies 2. Technology partners: Microsoft 3. System integrators and Service providers: Accenture, AT&T, HP, IBM, Orange Business Services and Skype 4. Consultants	Key Activities Developing UM solutions Application integration Managing partnerships Key Resources IT and telecomm infrastructure Software application Communication systems Proprietary knowledge	Customer Value Proposition 1. Increase productivity through a single messaging access point 2. Reduce training by providing a simple, streamlined user interface 3. enables mobile workers to remain engaged	Customer Relationship 1. Online P/S documentation 2. Self Service and Support Contact Service 3. Blogs and forums Channels 1. Online marketing campaign 2. Sales force 3. Channel partners	Customer Value Segment Finance Healthcare Hospitality Manufacturing Utility
Cost Structure Cost of sales of P/S Research and Development General and administrative Cost of services		Revenue Stream Communication solutions Global services Product support services Consulting and system integration		

Figure 11 - A business model canvas for Avaya Unified Messaging

Key Partners Technological partners: Meridian IT Inc. Polycom Inc. GN US Inc. SpinVox Limited business partners: Genesys UnifiedEdge Alliances: Avaya Cisco	Key Activities Application integration Infrastructure transformation Managing partnerships	Customer Value Proposition Scalability, security and flexibility Cost effective and security rich deployment	Customer Relationship Indirect collaboration through Lotus Sametime Wiki Direct relations through online portal and personal contacts	Customer Value Segment Education Finance Government Healthcare Insurance Retail Telecomm
	Key Resources Intellectual Properties Branding Lines of credit IT and telecomm infrastructure Software applications	Leveraging SOA and web services through Multi-vendor environment	Channels Online marketing campaign Channel partners	
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services			Revenue Stream Communication solutions Global services Product support services Consulting and system integration	

Figure 12 - A business model canvas for IBM UCC platform

Key Partners Technological partners: Meridian IT Inc. Polycom Inc. GN US Inc. SpinVox Limited business partners: Genesys UnifiedEdge Alliances: Avaya Cisco	Key Activities Application integration Infrastructure transformation Managing partnerships	Customer Value Proposition Increase employee productivity and effectiveness Increase awareness through presence enabled applications Help eliminate human latency by connecting experts to remote locations	Customer Relationship Lotus Sametime Wiki IBM Lotus portal and personal contacts Channels Online marketing campaign Channel partners	Customer Value Segment Education Finance Government Healthcare Insurance Retail Telecomm
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services			Revenue Stream Communication solutions Global services Product support services Consulting and system integration	

Figure 13 - A business model canvas for IBM Lotus Sametime Converged Communications

Key Partners Technological partners: Meridian IT Inc. Polycom Inc. GN US Inc. SpinVox Limited business partners: Genesys UnifiedEdge Alliances: Avaya Cisco	Key Activities Application integration Infrastructure transformation Managing partnerships	Customer Value Proposition Provides cost effective integrated telephony capabilities Optimize the value from existing enterprise applications	Customer Relationship IBM online portal Personal contacts	Customer Value Segment Education Finance Government Healthcare Insurance Retail Telecomm
	Key Resources Intellectual Properties Branding Lines of credit IT and telecomm infrastructure Software applications	Help speed business processes within applications	Channels Online marketing campaign Channel partners	
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services			Revenue Stream Communication solutions Global services Product support services Consulting and system integration	

Figure 14 - A business model canvas for IBM Lotus Sametime Unified Telephony

Key Partners Technology partners: Barbee Forsythe Packet360 Plantronics Business partners: World Wide technology Alliant technologies Presidio Radvision Service partners: IBM UNIS LUMIN	Key Activities Develop and Customize applications Infrastructure rationalization and transformation Manage partnerships	Customer Value Proposition Time and cost saving (capital and operational) Accelerate decision making and improve customer service High security levels to maintain continuity of voice service	Customer Relationship Cisco collaboration blog and Networking message boards Interoperability portal Live discussions	Customer Value Segment Advertising Education Energy /Materials Financial services Government Healthcare Manufacturing Retail Software development Transportation
Key Resources Intellectual property IT and telecom infrastructure Partnerships	Channels Direct marketing Indirect marketing and go to market alliances			
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services			Revenue Stream Communication solutions Global services Product support services Consulting and system integration	

Figure 15 - A business model canvas for Microsoft Lync communications enabled business platform

Key Partners Technology partners: Barbee Forsythe Packet360 Plantronics Business partners: World Wide technology Alliant technologies Presidio Radvision Service partners: IBM UNIS LUMIN	Key Activities Develop and Customize applications Infrastructure rationalization and transformation Manage partnerships Key Resources Intellectual property IT and telecom infrastructure Partnerships	Customer Value Proposition Increase overall productivity by providing a seamless workflow Simplify management and scalability Increase IT control and visibility Maximizing investments and ROI	Customer Relationship Cisco collaboration blog Networking message boards Interoperability portal Live discussions Channels Direct marketing Indirect marketing and go to market alliances	Customer Value Segment Advertising Education Energy /Materials Financial services Government Healthcare Manufacturing Retail Software development Transportation
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services		Revenue Stream Communication solutions Global services Product support services Consulting and system integration		

Figure 16 - A business model canvas for Microsoft Unified Communications

Key Partners Technology partners: Barbee Forsythe Packet360 Plantronics Business partners: World Wide technology Alliant technologies Presidio Radvision Service partners: IBM UNIS LUMIN	Key Activities Develop and Customize applications Infrastructure rationalization and transformation Manage partnerships Key Resources Intellectual property IT and telecom infrastructure Partnerships	Customer Value Proposition Increase productivity by Integration of messaging modes Reduce costs by providing communications alternatives from anywhere, any time Continuity of user voice experience across multiple devices	Customer Relationship Cisco collaboration blog and Networking message boards Interoperability portal Channels Direct marketing Indirect marketing and go to market alliances	Customer Value Segment Advertising Education Energy /Materials Financial services Government Healthcare Manufacturing Retail Software development Transportation
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services			Revenue Stream Communication solutions Global services Product support services Consulting and system integration	

Figure 17 - A business model canvas for Microsoft Unified Messaging

Key Partners Technology partners: Polycom Austra Plantronics Jabra Clearone Logitech System Integrator partners: BT Dell Dimension Data HP Orange Business Services Tieto Verizon Business	Key Activities Application integration Manage and maintain collaboration infrastructure Optimize and support service components Key Resources Financial assets Customer database Partnerships IT and Telecom infrastructure	Customer Value Proposition Eliminates employee and system delays Cost reduction Increase organizations responsiveness and agility Increase ROI	Customer Relationship Education programs, certifications and seminars Personal assistance and Support Contact Service Channels Direct and indirect marketing	Customer Value Segment High tech and Electronic manufacturing Power and Utility Healthcare IT and Telecom Media and Entertainment Government agencies Construction
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services			Revenue Stream Communication solutions Global services Product support services Consulting and system integration	

Figure 18 - A business model canvas for Cisco Collaboration enabled business transformation platform

Key Partners Technology partners: Polycom Austra Plantronics Jabra Clearone Logitech System Integrator partners: BT Dell Dimension Data HP Orange Business Services Tieto Verizon Business	Key Activities Application integration Manage and maintain collaboration infrastructure Optimize and support service components	Customer Value Proposition Improves efficiency and customer satisfaction Help eliminate communication silos that slow business processes Increase ROI by elaborating the integration of UC capabilities	Customer Relationship Education programs, certifications and seminars Personal assistance and Support Contact Service Channels Direct and indirect marketing	Customer Value Segment High tech and Electronic manufacturing Power and Utility Healthcare IT and Telecom Media and Entertainment Government agencies Construction
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services		Revenue Stream Communication solutions Global services Product support services Consulting and system integration		

Figure 19 - A business model canvas for Cisco Unified Application Integration platform

Key Partners Technology partners: Polycom Austra Plantronics Jabra Clearone Logitech System Integrator partners: BT Dell Dimension Data HP Orange Business Services Tieto Verizon Business	Key Activities Application integration Manage and maintain collaboration infrastructure Optimize and support service components	Customer Value Proposition Save costs and extend investments Maximize IT resources, simplify management and scalability Increase IT control and visibility	Customer Relationship Education programs, certifications and seminars Personal assistance and Support Contact Service	Customer Value Segment High tech and Electronic manufacturing Power and Utility Healthcare IT and Telecom Media and Entertainment Government agencies Construction
	Key Resources Financial assets Customer database Partnerships IT and Telecom infrastructure		Channels Direct and indirect marketing	
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services			Revenue Stream Communication solutions Global services Product support services Consulting and system integration	

Figure 20 - A business model canvas for Cisco Unified Communications

Key Partners Technology partners: Polycom Austra Plantronics Jabra Clearone Logitech System Integrator partners: BT Dell Dimension Data HP Orange Business Services Tieto Verizon Business	Key Activities Application integration Manage and maintain collaboration infrastructure Optimize and support service components	Customer Value Proposition Improve productivity Enhance flexibility, security and reliability	Customer Relationship Education programs, certifications and seminars Personal assistance and Support Contact Service	Customer Value Segment High tech and Electronic manufacturing Power and Utility Healthcare IT and Telecom Media and Entertainment Government agencies Construction
	Key Resources Financial assets Customer database Partnerships IT and Telecom infrastructure	Reduce costs	Channels Direct and indirect marketing	
Cost Structure Cost of sales of products and solutions Research and Development General and administrative Cost of services			Revenue Stream Communication solutions Global services Product support services Consulting and system integration	

Figure 21 - A Business Model Canvas for Cisco Unified Messaging

Appendix 2- 43 customer cases used for analysis of interdependencies

Customer Company Name	Value Segment	Customer Value Proposition	Strength of the CVP
1. CDW	IT Services	Improve customer deployment Improve user experience	Strong
2. Dow Corning	Chemical Industry	Improve innovation process Reduce overhead costs	Strong
3. Gunnebo	Professional services – security products	Improve efficiency Reduce telephony costs	Strong
4. Stoneridge	High Tech and Electronics Manufacturing	Cost efficient operations Flexible architecture	Strong
5. Medco Energi	Power and Utility Oil and Gas Industry	Improved communications Reduced hardware costs	Strong
6. Creation Technologies	High Tech and Electronics Manufacturing	Increase productivity Avoid future hardware	Strong
7. SEMARNAT	Government Agencies	Improve productivity and security compliance	Strong
8. Sporton International	High Tech and Electronics Manufacturing	Improve productivity up to 30% Reduce cost	Weak
9. NDS	Media and Entertainment	Improve productivity Reduce costs	Strong
10. Tieto	IT Services	Improved user experience Reduce total cost of ownership	Strong

11. Salford City Council	Government Agencies	Ease management Reduce costs	Strong
12. Damovo	IT Services	Simplify deployment Reduce communication costs	Strong
13. Georgia Military College	Education	Resolve student problems faster Reduce travel and training cost	Strong
14. TP Group	Telecommunication Industry	Eased management Reduce costs	Strong
15. Yapi Kredi	Financial Services	Increase efficiency Reduce costs	Strong
16. City of Vaxjo	Government Agencies	Reduce environmental footprint Reduce annual cost	Strong
17. Herrenknecht	Construction	Improve productivity Reduce cost	Strong
18. POSTeti	IT Service	Support agile work Help to reduce costs	Strong
19. Gluck and Kanja	IT Service	Flexible deployment options Help to reduce costs	Weak
20. GEA Group	Manufacturing	Improve productivity Reduce communications costs	Strong
21. Chunghwa Telecom	Telecommunication Industry	Improve communications Reduce costs	Strong
22. JJ Foods Service		Remove barriers to communications Ease configuration	Strong
23. Ogilvy and Mather	Advertising	Access tools for tele-workers Saving in conferencing costs	Strong

24. St. Saviour's School	Education	Improve learning, collaboration and productivity	Strong
25. Colin Powell Youth Leadership Center,	Education	Advance workplace collaboration Allocate costs	Strong
26. Urban Ventures Leadership Foundation	Education	Customize call handling Reduce costs	Strong
27. Cristo Rey Jesuit High School	Education	Ability to communicate remotely Improve productivity	Weak
28. Thiess	Mining and Construction	Ease of reaching tele-workers Simplify management	Strong
29. First Community Bank	Financial Services	Easier access to contact centers Saving on circuit annual costs	Strong
30. Mountain America Credit Union	Financial Services	Increase cross-sell revenues Lower agent turn-over	Strong
31. Deloitte	Financial Services	Consolidate operations Improve collaboration	Strong
32. Wycombe District Council	Government	Easier access to council services Improve customer service	Strong
33. OneOncology, Inc.	Healthcare	Simplify internal communication Excellent customer service	Strong

34. University of Miami Center on Aging	Healthcare	Video-based counseling Cost effective training	Strong
35. Biesse America	Manufacturing	Simplify conferencing Reduce repair visit costs	Strong
36. Cross Company	Manufacturing	Easier access to right person Enhance customer service	Strong
37. TBL Networks	Reseller	Double revenue in six months Develop application faster	Strong
38. E-velocity	Reseller	Differed capital investment Communicate effectively	Strong
39. Direct Visual	Reseller	Demand growth for new markets Enhance customer service	Strong
40. Seyfer Automotive	Retail	Increase productivity Improve customer service	Strong
41. Everything Tradeshows	Retail	Increase responsiveness Reduce operational expenses	Strong
42. Activision Publishing	Software Development	Simplify IT management Accelerate innovation	Strong
43. Danish Rail	Transportation	Greater agent efficiency Improve 1st time call resolution	Strong

Appendix 3– 14 samples of analysis of interdependencies

Figure 22 to Figure 35 provides 14 samples of the analysis of interdependencies between key elements of business models.

Figure 22- Avaya providing optimized communications to finance companies

The model in Figure 22 describes how Avaya delivers optimized communications to banks and finance companies. Avaya defines the job that need to be done as to deploy a consistent communications enabled system that can provide optimized system solutions independent of location to finance companies. For this purpose, a combination of three market offers of ACE platform are required: multi-vendor voice from Avaya, Cisco and IBM, along with click to call product of packaged and custom applications and Hot

Deskings. Resulting value proposition includes higher ROI as per multiple vendor identity of communications infrastructure, an hour per week increased productivity due to application integration independent of location and cost savings for mobile employees.

Figure 23- Avaya retains high value customers for finance companies

The model in Figure 23 describes how Avaya retains high value customers of banks and finance companies. Clients of finance companies require timely market updates and personalized services as well as more efficient communications with traders and advisors. For this purpose, a bundle of three market offers of ACE platform are required: A CRM

system from IT and web developer toolkit, CRM click to call integrated with Avaya voice and Message Drop and Message Blast API's. Consequently, customer relations staff would be able to record personalized messages, click to call from client lists in CRM, play messages into phone calls and send them out to customer groups. Resulting value proposition includes 5% improvement in client retention due to personalized services and one hour per day productivity increase due to click to call and drop and blast capabilities.

Figure 24—Avaya delivers streamlined business workflows to healthcare

The model in Figure 24 describes how Avaya streamline business workflows for healthcare system companies. Healthcare needs to provide access for care providers to the data from disparate clinical support system. Avaya also defined the second job that need to be done as to provide visibility to care givers. To fulfill these two jobs, a combination of two market offers of ACE platform are required: Multi-vendor voice and video system and Click to call, IM, SMS, e-mail and clinical data sharing from healthcare portal applications. Resulting value proposition includes 75% improvement in clinical workflow efficiency, 30 min per day improved productivity and higher ROI from multi-vendor applications.

Figure 25- Avaya improves IT responsiveness for manufacturing and utility

The model in Figure 25 describes how Avaya improves IT responsiveness for manufacturing and utility companies. Clients of such companies require are looking for further ways of enhancing responsiveness to critical events. For the purpose of this job, a bundle of two market offers of ACE platform are required: Event Response Manager for automated notification and conferencing from packaged and custom applications along with an IT system monitoring from a partner (NetIQ) for security and performance management. Consequently, customer relations staff would be able to record personalized messages, click to call from client lists in CRM, play messages into phone calls and send

them out to customer groups. Event Response Manager can be linked to manufacturing processes to notify the right people at the right time, transferring them onto a conference call whenever a significant event or alarm is triggered. This capability minimized manufacturing process downtime and logistical delays. A utility company can also utilize location tracking devices and proximity triggered audio messages to notify customers of impending arrivals of an employee to give the customer enough time. This functionality reduce the time and cost of repeat visits and improves customer satisfaction. Resulting value proposition includes 5% improvement in client retention due to personalized services and one hour per day productivity increase due to click to call and drop and blast capabilities.

IBM

Meridian Inc.

As a partner of IBM, Meridian IT Inc. fills the organization and technical gaps and empower organizations to make informed, knowledgeable communications enabled choices for their business. When organizations deploy communications enabled

platforms, Meridian IT Inc.'s Center of Excellence, combined with the IBM Business Partner Innovation Center, allow rapid prototyping and proof of concept testing, early identification of risks, and rapid achievement of business value.

Figure 26 – Meridian IT Value Proposition

The model in Figure 26 describes how IBM with its certified partner, Meridian IT Inc., provides dynamic presence, streamlined business process, enhanced response time and improved efficiency for the customers. Clients are looking for a compelling UC platform

to bridge the organizational and technical gaps in their companies. In order to fulfill this job, a combination of three market offers are required: IM, click to call from Meridian application integration, Voice and video from IBM Sametime to initiate telephony integration and Unified Messaging from Meridian to manage voicemail on Sametime interface. Application integration with Meridian adds presence, chat and click-to-call functionality to applications and web servers from IBM, providing IBM customers with IM support in call centers with additional communication channels. Meridian's telephony integrates with IBM Lotus Sametime, enabling users to initiate voice and video sessions from the Sametime interface with click-to-call functionality. Meridian's presence augments the status options already available in IBM Lotus Sametime with indicators that show when a user is on the phone. Unified Messaging enables users to manage voicemail directly from the IBM Lotus Sametime client.

Polycom Inc.

IBM and Polycom have teamed to deliver the Polycom Unified Collaboration Solution for IBM Lotus Sametime which integrates the power of Lotus Sametime with Polycom's voice and video collaboration solutions. Polycom Unified Collaboration for Lotus Sametime, enables users to leverage the power of IBM's desktop video client to seamlessly interoperate with standards-based tele-presence and video conferencing systems.

Figure 27– Polycom Value Proposition

The model in Figure 27 describes how IBM with it's partner, Polycom facilitates streamlined collaboration, lowers costs, enriches user experience and provides greater flexibility and investment protection. Clients are looking for a high performance workplace and the job to be done to satisfy this need, is to deploy and open, interoperable communication enabled solution. In order to fulfill this job, a combination of three market offers are required: Polycom's HD audio and video application, Polycom's multi-

point conferencing bridge and Multi-party IM and continuous presence from Polycom, all integrated with Lotus Sametime.

Polycom's audio and video endpoints and multipoint conferencing bridges integrated with Lotus Sametime enable enterprise users to seamlessly collaborate with others from their desktop and conference rooms.

Jabra

Jabra, an awarded partner of IBM, provides integrated call control with the full range of Jabra USB corded and wireless end points. Remote call control is enabled when using Jabra wireless headsets and IBM Lotus Sametime integrated with Sametime Unified Telephony.

Figure 28– Jabra Value Proposition

The model in Figure 28 explains how Jabra in cooperation with IBM can deliver high performance remote call control. A combination of the following three market offers can fulfill the job-to-be-done for customers: Jabra wireless headset and softphone within IBM Sametime Unified Communication platform, Jabra PC suite control center for management and configuration of headsets and Jabra IT development toolkit including software drivers and upgrades. The seamless integration of headset and soft phones allows users to benefit from enhanced mobility and the ability to multitask while on a

call. The wireless freedom improves work efficiency, increases productivity and provides ergonomic comfort leading to employees satisfaction. With Jabra wireless headsets users can answer and end calls up to 450ft. away from their desks. Resulting value proposition is the ability to answer calls up to 450ft. away from the desk, enhanced mobility and ability to multi-task, ergonomic comfort and increased productivity by saving 7.5 min per hour on the phone.

SpinVox Limited

SpinVox captures voice messages and converts them to text, delivering them to any destination type of SMS, email, website and social networks.

Figure 29– SpinVox Value Proposition

The model in Figure 29 describes how IBM with it's partner, SpinVox leverages and facilitates the power of voice to manage voicemail more easily. In order to fulfill this need, a set of four market offers of SpinVox integrated with IBM UCC platform is essential: SpinVox voice mail to receive voicemail as SMS and email, SpinVox Manager

to speak a text when there's no answer, SpinVox Organize to utilize customer's voice for adding new contacts, meetings and tasks and finally, SpinVox Note, to convert customer's issues from voice mail to text and route them to the optimal agent for resolution. The SpinVox Voice Message Conversion System (VMCS) combines ASR technologies, unique tools and live learning. SpinVox provides scalable, secure, fast and highly accurate, speaker independent voice conversion in multiple languages. SpinVox Voicemail alone can save each employee an average of 15 to 20 minutes each working day. Easy reply provided options facilitate the two way flow of communications resulting in a dynamic conversational flow that haven't exist before with traditional voicemail. The resulting value proposition is to deliver fast and highly accurate (up to 97%) speaker independent conversion of voice to text, accelerate workforce responsiveness by saving 15-20 min per day, 80% increase in customer satisfaction, 20% increase in agent productivity and 48% reduction in abandoned calls at call centers.

Microsoft

Figure 30- Microsoft provides agile communications for Oil and Gas industry

The model in Figure 30 describes how Microsoft provides agile communications for companies of power and utility, oil and gas industry. Clients of such companies need to improve their communications at remote locations. To satisfy this need, a bundle of five market offers are required: Presence, IM, robust conferencing and enterprise voice from MS Lync server platform, MS Hyper-V, a feature of Windows 2008, to virtualize all servers in Lync platform, Lync Management pack for system center operation to monitor and report in Lync environment, Desktop sharing and whiteboard capabilities for troubleshooting and brainstorming and Microsoft Survivable Branch Appliance (SBA) hardware package integrated with Ferrari SBA to provide redundant voice connection in case of network outage. Resulting value propositions is to improve the ability to provision new servers, extend enterprise voice for remote employees and finally reduce hardware operation and maintenance expenses.

Figure 31- Microsoft provides high efficiency workplace for manufacturing industry
The model in Figure 31 describes how Microsoft delivers high efficiency workplace for manufacturing companies. Microsoft identify the job-to-be-done as to provide teleworkers, a single interface to simplify knowledge sharing. For this purpose, a combination of six market offers are the best match to fulfill the job: Presence, IM, robust conferencing and enterprise voice from MS Lync server platform, MS HD webcams for high definition video, Lync Client for recording meetings to facilitate knowledge sharing,

integration with MS Office SharePoint 2007 to search for right experts to help with an issue, Activity Feed in Lync platform to check the latest activities for tele-workers and Rich Content Card in Lync platform for skill search and delivering more visibility. As a result of this combination, manufacturing industry can benefit from simplified experience for admin and end users, improved innovation process, reduced training costs by 20%, reduced IT and overhead costs by using video conferencing for meetings and material testing and effective knowledge sharing across geographically diverse workforces.

Figure 32- Microsoft delivers resilient communications to government agencies

The model in Figure 32 describes how Microsoft delivers resilient communications to government agencies. Government agencies require effective communication solution to be able to provide an efficient user experience. For this purpose, a bundle of the following five market offers is the best combination to fulfill this job: Presence, IM, robust conferencing and enterprise voice from MS Lync server platform, MS Hyper-V, a feature of Windows 2008, for virtualization, partnering with POSTcti for final topology

and configuration, Response Group Service in Lync to route calls in the community with a single number, Polycom CX500 IP phone specially designed phone hardware for Lync platform used for directory search and presence information and finally, Lync management pack for system center operation management for monitoring and reporting in Lync environment.

Resulting value proposition includes agile workforce and reduced overhead costs, ease management and improved user experience.

Cisco

Figure 33- Cisco enhance communication's speed in mining and construction

The model in Figure 33 describes how Cisco enhance productivity in mining and construction industry. The job-to-be-done to enhance communication in this industry is to increase the speed of communications with global partners. To satisfy this job, a bundle of market offers are required as follows: Cisco Unified Communications Manager, Cisco Unified IP phones and wireless phones, Cisco Unified IP conference station, Cisco

Unified Personal Communicator, Cisco Unified Presence to exchange information and instant messaging with partners, Cisco Unified Meeting Place, Cisco Unified Contact Center Express, Cisco Unified Connection, Cisco Unified Video Advantage. Resulting value propositions includes facilitated working with global workforce, reduced turnaround service request from 2 days to 30 minutes, reduced at least 10% of mobile costs, reduced travel and simplified management.

Figure 34- Cisco delivers mobility to educational institution

The model in Figure 34 describes how Cisco delivers mobility to educational institutions. The identified job that need to be done is to support mobile teachers and help students to succeed at school. For this purpose, a combined seven market offers of Cisco CEA platform are required: Cisco Unified Communications Manager, Cisco Unified Messaging, Cisco Unified IP phones, Cisco Unified Conference Station, Cisco Unified Personal Communicator, Cisco Unified Survivable Remote Site Telephony and Cisco Emergency Responder. Resulting value propositions are low cost of ownership, support for mobility, flexibility to support different user group and expose students to advanced workplace collaboration technology.

Figure 35- Cisco provides rich collaboration for advertising industry

The model in Figure 35 describes how Cisco delivers richer collaboration for advertising industry. Advertising companies are willing to pay for a system that can provide same communication tools in the field and in office for all staff. A combination of eight market offers of Cisco CEA platform are required: Cisco Unified Communications Manager, Cisco Unified Meeting Place, Cisco Unified IP phones and wireless phones, Cisco Unified Presence, Cisco Unified Personal Communicator, Cisco Unity Connection, Cisco Unified Video Advantage and Cisco Unified Mobility. Resulting value propositions are differentiated client service, simplified internal communications, enhanced support for mobile employees, recruitment and retention advantage and lower costs.

Appendix 4- Analysis of shift in the basis of the competition

Analysis in this section is based on Johnson's (2010) frame of business model innovation, called "White Space Within". Johnson believes that the opportunities to innovate business models often relate to shifts in the basis of competition that are predictable. Johnson (2010) defined the basis of the competition as the characteristics of market offers for which customers are willing to pay. Each shift emphasizes on a different type of innovation in the growth curve. Johnson's (2010) frame express the fact that at the early stages of market development, most of the companies generally compete on the basis of *functionality*. A while after, customers are won't be willing to pay for additional performance improvements, because the jobs related to performance and functionalities are mostly done. Therefore, the basis of competition shifts to *reliability* and process innovation becomes the main criteria for success. Companies refine their existing business models by improving processes such as manufacturing, procurement, customer relationships management and technical support services. Once most of the functionality and reliability requirements of the consumers fulfilled, the basis of the competition shifts to *customization* and *convenience*. And finally, when a competitive market offer accomplishes almost all jobs related to three aspects of competition (functionality, reliability and convenience), the market becomes commoditized and companies compete on cost. Whenever the basis of competition shifts to convenience and fully to cost, customers jobs to be done change in a principal and structural way, leading to a business model innovation.

Figures 36 to 39 illustrate the analysis of shifts in the basis of the competition applying Johnson's frame of white space within in the CEA market. The analysis demonstrates how large suppliers of CEAs manage innovation in every stage of their growth in communications enablement to respond to changes in the basis of the competition.

Avaya

Figure 36 -Avaya's Journey in Communications enablement

Description of the model in Figure 36

Avaya's entered in CEA competition with it's enterprise centric communication enabled solution called IP unified messaging portfolio providing features like call answering, voice messaging and speech capabilities. The solution offers various messaging storage functionalities: combine storage and the messaging application on the server, deploy

them separately or use the email server. At this stage, Avaya upgrades its infrastructure to combine voice and data networks into a unified messaging system that can handle the quality-of-service. In this phase, Avaya introduces additional features where the basis of the competition is on functionality.

The next stage is convergence with applications: Unified Communications, a way to bring together many modes of communications such as email, voicemail, instant messaging, video and presence to deliver a seamless experience. This stage is typically driven by the need to increase employee productivity since customers were not willing to pay for more features. Thus, the basis of the competition shifts to reliability. In the convergence with applications phase, Avaya refines its existing business model so that business processes and workflows can be modified to take advantage of unified communications applications.

The third stage is unified communications and collaboration platform. At this stage, Avaya creates innovative business models, designs different methods to integrate voice and video with collaboration tools and business processes within the platform. As the company moves forward in the stage of communications and collaboration, there are some critical technology issues. Requirements for bandwidth capacity are increasing dramatically as a result of increasing collaboration over distances, increasing use of video and increasing data sharing.

The final stage incorporates a multi-vendor communication environment. Significant changes including a growing number of collaborators from many different vendors and

partners who will be using many different networks occurs in all aspects. The platform, therefore, must allow users to work seamlessly over multiple vendor communications networks with increased capacity. Each stage in the journey to multi-vendor communications environment enhances business value and company gains capabilities that provides a compelling competitive advantage.

IBM

Figure 37- IBM's Journey in Communications enablement

Description of the model in Figure 37

IBM started its journey in communication enablement with hundreds of traditional site-based PBX's and the scope was limited to voice through public switched network

connections and voice mail. Over time, IBM began moving to standards-based systems, voice and video became data and convergence in IP telephony and VoIP emerged. At this stage of growth, IBM upgrades its infrastructure to combine voice, video and data networks into a single unified system which can handle the bandwidth, quality and availability. In this phase, IBM introduces additional functionalities, while reducing costs through greater efficiency and value added services.

The next stage is convergence with applications: Unified Communications.

UC capabilities including IM, presence, unified messaging and more, facilitates collaboration and efficiency at both the user and organizational level. Once IBM communication enabled systems become converged with applications, the basis of the competitions shifts from functionality to reliability and IBM deploy process innovation substitute to product innovation to respond to the change in the competition basis.

The final stage seized by unified communications and collaboration platform. This is the stage that IBM creates innovative business models, design comprehensive ways to integrate voice and video with collaboration tools and business processes within the platform. As IBM moves forward in final stage of communications and collaboration, various collaborators from different sides of the platform who would be using many different networks providing different value propositions bring significant changes in the structure of the business models, the rules and regulations. The platform, therefore, allows employees to work seamlessly over multiple networks with increased capacity.

Microsoft

Figure 38- Microsoft's Journey in Communications enablement

Description of the model in Figure 38

Microsoft started the journey to communication enablement with the an enterprise centric network convergence system; an integration of all different messaging functionalities including e-mail, SMS, Fax, voicemail, and video messaging into the single interface which is called Unified messaging. At this stage, Microsoft upgrades it's infrastructure to combine voice, video and data networks into a single unified messaging system introducing additional features and functionalities, engaging product innovation.

In the second stage, the company grows to convergence with applications level: Unified Communications which brings together several modes of communications such as email, voicemail, instant messaging, video and presence to deliver a seamless experience to the customers. At UC stage, Microsoft switches the innovation focus from product innovation to process innovation to enhance productivity and reliability.

The final stage includes unified communications enabled platform. At this stage, Microsoft has entered into level of competition where users seeking for communication enabled systems that are available, anywhere, anytime within the context of other applications in minimum costs. Microsoft has designed a multimedia communications and collaboration platform that is unified, is administered through a single infrastructure and is broadly interoperable to be able to respond to shift in the basis of the competition from reliability to cost. The platform integrates voice and video with collaboration tools and business processes within the platform and new information flows to provide business leadership. Such a comprehensive response to shift in the competition of CEA required a transformation in Microsoft business model, redefining all key elements of the business model, as well as key processes, rules and regulations.

Cisco

Figure 39 -Cisco's Journey in Communications enablement

Description of the model in Figure 39

The analysis shows Cisco started its communication enabled solutions with Unified Messaging which route messages and exchange subscriber within an enterprise centric hub. At this stage, Cisco promote its communication infrastructure to combine voice, video and data networks into a single unified messaging and telephony system. In this phase, Cisco utilize product innovation introducing additional features and functionalities to overcome competitors on the basis of the functionality in competition.

The next stage is convergence with applications: Unified Communications: a way to bring together many modes of communications such as email, voicemail, instant messaging, video and presence to deliver a seamless experience. At UC stage, Cisco accelerates productivity since customers are willing to pay for reliability as supposed to more functions and business processes and workflows are modified to take advantage of unified communications applications through managing process innovation.

The final stage includes two platforms: Unified Application Environment and Collaboration Enabled Business Transformation platforms. Two platforms are different from business model perspective and the underlying technology through which they deliver the service.

At this stage, Cisco, innovates comprehensive ways to integrate voice and video with collaboration tools and business processes and information flows. As the company moves toward this stage, the basis of the competition shifts from reliability to convenience and cost.

Appendix 5- White space beyond

The data used for analysis of shifts in problem solving is abstracted in the Table 4 along with the business model canvases (Appendix 1).

Company	Market Offer	Job-to-be-done	Problem solving method	Business Model structure			
				Customer value proposition	Profit Formula	Key Resources	Key Processes
Avaya	Avaya Unified Messaging	Integration of different non-real time communication services	Unstructured, intuition based problem solving	Provide UM solution to reduce costs	Fees for services High overhead costs	Expert people and knowledge of messaging communications	Converged networks
	Avaya Unified Communications	Integration of real time with non-real time communication services	Pattern-recognition and rule based decision making	Consistent unified user interface and user experience	Fees for total UC solutions Low overhead costs	UC technologies Partnerships	Integrated systems, solutions and processes
	Nortel/Avaya Agile Communication Environment	Integration of UC capabilities with business applications and processes	Cooperative problem solving in an ecosystem	Reduce human delays	Memberships Subscriptions Advertising	Multi-vendor communication systems Relationships	Business process transformation Multi-media collaboration
IBM	IBM Lotus Sametime Unified Telephony	Integration of different real time communication	Unstructured, intuition based	Provide UT solution to reduce costs	Fees for services High	Expert people and knowledge of telephony systems	Converged networks

		services			overhead costs		
	IBM Lotus Sametime Converged Communications	Integration of real time with non-real time communication services	Pattern-recognition and rule based decision making	Consistent user experience	Fees for total solutions Low overhead costs	UC technologies Partnerships	Integrated systems, solutions and processes
	IBM Sametime Unified Communication and Collaboration Environment	Integration of UC capabilities with business applications and processes	Cooperative problem solving in an ecosystem	Reduce human delays	Memberships Subscriptions Advertising	Multi-vendor communication systems Relationships	Business process transformation Multi-media collaboration
Cisco	Cisco Unified Messaging	Integration of different non-real time communication services	Unstructured, intuition based problem solving	Provide UM solution to reduce costs	Fees for services High overhead costs	Expert people and knowledge of messaging communications	Converged networks
	Cisco Unified Communications	Integration of real time with non-real time communication services	Pattern-recognition and rule based decision making	Consistent unified user interface and user experience	Fees for total UC solutions Low overhead costs	UC technologies Partnerships	Integrated systems, solutions and processes
	Cisco Unified Application Environment	Integration of UC capabilities with business applications and processes	Cooperative problem solving in an ecosystem	Reduce human delays	Memberships Subscriptions Advertising	Multi-vendor communication systems Relationships	Business process transformation Multi-media

							collaboration
	Collaboration enabled business transformation platform	Integration of UC applications with business processes and workflows	Cooperative problem solving in an ecosystem	Reduce system delays by accelerating processes	Memberships Subscriptions Advertising	Multi-vendor communication systems Relationships	Business process transformation Multi-media collaboration
Microsoft	Microsoft Unified Messaging	Unstructured, intuition based problem solving	Provide UM solution to reduce costs	Fees for services High overhead costs	Expert people and knowledge of messaging communications	Converged networks	Unstructured, intuition based problem solving
	Microsoft Unified Communications	Integration of real time with non-real time communication services	Pattern-recognition and rule based decision making	Consistent unified user interface and user experience	Fees for total UC solutions Low overhead costs	UC technologies Partnerships	Integrated systems, solutions and processes
	Communications enabled business process platform	Integration of UC capabilities with business applications and processes	Cooperative problem solving in an ecosystem	Reduce human delays	Memberships Subscriptions Advertising	Multi-vendor communication systems Relationships	Business process transformation Multi-media collaboration

Table 4 - Data used for analysis of shifts in the problem solving

Appendix 6– Description of the new model for BM innovation

The new model of business model innovation, displayed in Figure 8, argues that at their first stage of growth and renewal, large suppliers of CEAs, are developing first generation of CEAs to provide overall unified system solutions to reduce communications costs in a solution based business model. Such business model makes money by charging for service fees in a revenue model with high overhead costs, high profit margins and low resource velocity. Key processes in this type of CEA business model is focused on converged networks and key resources are experts and knowledge.

The model suggests that with any shifts in the basis of the competition or in the problem solving continuum, large suppliers of CEAs improve their business model to respond to the shift. This class of CEAs includes unified communication systems which tend to provide high volume communications enabled solutions at lower costs by utilizing pattern recognition problem solving approach in integration of applications and processes. This type of business models make money by charging fees for outcome solution in a revenue model with lower overhead costs. Such business models are based on integrated systems and solutions as key processes and communications enabled technologies and partnerships as key resources.

As shown in the model, once the basis of the competition shifts to convenience or the problem solving shifts to rule-based decision making, next generation (third generation) of CEAs tend to innovate their business models to the third type of business models – multi-sided platform business model – to connect all players in the problem solving process of reducing the system

delays. The revenue model in such business models are advertising, membership or subscription based and the model uses multimedia collaboration and business process transformation as the key processes and relationships between players and multi-vendor communications systems as key resource.

Appendix 7- Description of CEA market offers

Avaya CEAs:

a) Avaya Unified Messaging Solutions

Avaya's standards-based, IP unified messaging portfolio provides features like call answering, voice messaging, and speech capabilities and comprises four products: Avaya Aura Messaging, Avaya Modular Messaging, Avaya CallPilot, and Avaya Hospitality Messaging Server. Each product supports specific business needs and particular job-to-be-done for the users.

1. Avaya Aura Messaging

Aura Messaging provides a rich set of features including speech recognition for names, speech-to-text conversions and a voicemail toolbar for email environments. Avaya Aura Messaging offers flexible capacity scaling options through combining messaging storage and the messaging application on the servers, deploy them separately, or use the email server.

2. Avaya Modular Messaging

Modular Messaging is responsible for keeping messages accessible anytime, anywhere. It supports a wide range of devices including phones, fax machines, and PCs. The resulted flexibility can enhance employee productivity, improve customer satisfaction, lower costs, and drive more revenue.

3. Avaya CallPilot™

CallPilot provides voice/fax messaging and integrated unified messaging capabilities through the user's familiar desktop e-mail environment. It also offers Web-based unified messaging and personal mailbox management.

4. Avaya Hospitality Messaging Server

A customized messaging solution to facilitate the communication between guests and staff in small and large hospitality venues. It delivers advanced communication functionalities which can boost overall guest satisfaction as well as the operational efficiency.

b) Avaya Unified Communications solutions

Avaya Unified Communications solution brings together real-time and non-real time communications in a secure, integrated and reliable environment which provide require tools to communicate efficiently via speech, IM, video, email, voicemail, mobile and portals. The objective is to provide a seamless user experience regardless of device, network or location.

Avaya Aura constitutes the core of Avaya Unified Communications platform supporting unified communications and contact center solutions for midsize to large enterprises. It simplifies complex networks and reduces infrastructure costs by leveraging a Session Initiation Protocol (SIP) architecture and virtualization technology.

Avaya Unified Communication solution is bundle of eleven market offers in three different editions of essential, standard and advanced to offer user specific licensing. This type of

bundling the market offers not only significantly reduce the cost of implementation of Unified Communications, but also remove the risk. The first following five applications considered as the core in the platform and the rest seven are offered to support various levels of scalability and redundancy.

1. Avaya Aura Communication Manager

An open, extensible IP telephony solution which can be deployed as an IP PBX or feature server. It supports a SIP-only environment, or as an evolution server supporting both SIP and non-SIP environments. Communication Manager delivers rich voice and video call control for a wide range of servers, gateways, and analog, digital, and IP-based communication devices.

2. Avaya Aura Session Manager

Session Manager provides an easier centralized SIP trunking⁸, easier “on-net” call routing, and enhanced scalability and security. This type of architectural flexibility allows customers to significantly reduce their telecommunications and management costs, lower total cost of ownership, and increase agility by providing rapid deployment of the system to various users and locations.

⁸ A SIP trunk enables companies to replace the traditional fixed Public Switched Telephone Network (PSTN) lines with PSTN connectivity via a SIP trunking service provider on the Internet.

3. Avaya Aura Application Enablement Services

A set of enhanced telephony APIs, protocols, and web services are available to developers. Application enablement capabilities support access to call processing, media, and administrative features which are available in Communication Manager. Off-the-shelf and custom integration with hundreds of communications and business applications such as Microsoft Office Communicator and IBM Lotus Sametime, as well as a broad range of Call Center, Call Recording and Click-to-Dial applications would be possible through Application Enablement Server.

4. Avaya Aura Presence Services

This product provides a scalable, high performance presence aggregation service that collects and disseminates presence information between Avaya and other third-party endpoints. Aura presence helps to expand contact center capabilities by leveraging resources across the entire enterprise to better serve the customers.

5. Avaya Integrated Management

Integrated Management offers a comprehensive set of applications designed for simplification of system administration, provisioning, and network management. The system also assists enterprises to manage thousands of branch locations centrally and improve network uptime.

6. Avaya Aura Session Border Controller

This solution controls and delivers secure interactive communications of voice, video and multimedia sessions. Session Border Controller supports applications for Unified Communications including remote worker and agent solutions. Avaya Aura Session Border Controller is powered by Acme Packet, a market leader in session border controller solutions.

7. Avaya Aura System Manager

Aura System Manager is a common management platform based on Service Oriented Architecture (SOA) contributing to reduce system management complexity. It provides centralized management functions for provisioning and administration which lets customers expand management capabilities to include additional products, vendor applications and solutions under one management umbrella.

8. Avaya Aura Communication Manager Messaging

Integrated voice mail for Communication Manager is provided by leveraging this application. Features such as call answering and messaging capabilities that lets a user manage messages on a PC, add a voicemail component to a text message, and listen to text messages over the phone are major functions of Aura Communication Manager Messaging.

9. Avaya Aura Media Services

The Media Services software gateway helps businesses using IP or SIP phones and trunks to avoid the high cost of gateway hardware. Built on proven Voice over IP (VoIP) media gateway technology, Media Services enables the deployment of Avaya Aura in one-box.

10. Avaya Aura System Platform

System Platform delivers simplified deployment of Unified Communications and Contact Center applications by leveraging virtualization technology, pre-defined templates, common installation, licensing, and support infrastructure.

11. Avaya Aura Collaboration Server

The Avaya Aura Collaboration Server provides the core elements of Avaya Aura in a single server solution. It enables businesses with existing Avaya infrastructure to evaluate Avaya's newest SIP endpoints and applications without the need to upgrade the entire communications network. As a result, with a minimum investment, Avaya customers can conduct targeted end-user trials.

Figure 40 -Avaya Unified Communications Platform architecture

c) Agile Communication Environment (ACE)

Nortel/Avaya Agile Communication Environment is a software-based foundation that dramatically simplifies and accelerates the integration of multi-vendor communications systems with business applications. ACE enables key communication capabilities or services such as Click to Connect, location, presence and instant messaging, to be presented as services in a web-based environment. Nortel/Avaya ACE is focused on leveraging SOA and Web Services in order to deliver rich communications-enabled applications and business processes for both enterprise and carrier customers.

ACE comprises of three main market offers: High Level IT-centric Web Service Toolkits, Lower Level Developer Toolkit and Packaged and Customer Applications. Each market offer includes a bundle of various communications enabled solutions (see Figure 41).

ACE high level web service toolkits provides web service APIs that allow IT developers integrate communications with business applications up to five times faster than before.

The foundation developer toolkit includes low-level Java APIs that leverage Avaya Aura for control of the call flows across the network. Integration with multi-vendor communications platforms is easy with pre-written adapters that allow control of systems from Avaya, Cisco, Microsoft and others.

Figure 41- Nortel/Avaya Agile Communications Environment

Custom and packaged applications provide plug-and-play functionality for accelerated return on investment and includes the following 10 market offers:

1. ACE Office and Web Browser Add-In

Nortel/Avaya ACE interfaces with the PBX to set up calls, let users click to call telephone numbers from web pages. The Office Add-In enable users to call contacts from within Microsoft Outlook and click to call numbers via smart tags in Microsoft Office documents.

2. Multi-vendor application integration

ACE provides adapters that support interactions with multi-vendor communication systems such as Cisco, Microsoft, IBM, Tandberg and Polycom.

3. ACE Hot Desking

ACE Hot Desking provides a Web interface to manage their various voice and video devices. The interface can be applied to the situations where there is a need to set the call forwarding status of a worker's desk phone or to register another device as a temporary hot desk phone. Hot desking can be integrated with Nortel/Avaya or non-Avaya communications environments to facilitate flexibility.

4. ACE Mobile Cost Optimizer

This application can significantly lower costs of corporate mobile phones by integrating BlackBerry smart phones within a company's communications environment. It instructs a company's PBX environment, whether from Nortel, Avaya or another vendor, in order to use the enterprise voice network instead of the mobile network for outbound calls.

5. ACE Corporate Portal

ACE communication enabled corporate directory solution delivers a user friendly click to communicate functionality that can be embedded into any web portal. Corporate portal enable users to communicate and collaborate with others from a single interface. Users have the option

to select the appropriate channel for instant messaging, voice and video communication without the need to search among multiple directories.

6. ACE IBM Lotus Sametime Integration

ACE integrates existing multi-vendor telephony and video systems with IBM Lotus Sametime. As a result of this integration, employees can use their desk phones or preferred devices to click to call and to see telephony presence within Sametime.

7. ACE Event Response Manager

This component accelerates responsiveness to critical events and reduces business downtime. When an event occurs, Event Response Manager can automatically notify the right people and connect them in a conference call immediately.

8. Mobile Business Applications

ACE provides API's that span desktop and mobile communication enabled applications to support verticals as well as integrating business processes. These applications work together actively with multi-vendor communication systems to provide a consistent user experience.

9. ACE Message Drop and Message Blast APIs

Typically, these tools are responsible to integrate single or multi-vendor PBX systems with CRM applications to provide click-to-dial, automated recording, and notification features. These APIs

allow administrators or employees to send recorded messages to large groups, or to drop personalized messages into telephone conversations.

10. ACE Contact Center Integration

ACE can be used to build innovative customer service solutions beyond traditional boundaries of the contact centers. It can automatically notify customers when an event occurs and connect them automatically to the contact center agents. ACE also contributes to provide “Expert Anywhere” solutions so that agents could access to subject matter experts across the enterprise, solving customer’s problems more effectively in a shorter time.

IBM CEAs:

a) IBM Lotus Sametime Unified Telephony

IBM Lotus Sametime Unified Telephony software is a unified communications middleware which integrates telephony across multivendor PBX systems and provides a unified end user experience, including integrated softphones; phone and IM presence awareness; call control and rules-based call management across multiple communications systems. Through leveraging, extending and unifying existing telephony assets with real time collaboration tools, an enterprise can help users more easily collaborate, working smarter together to speed decision-making and business processes.

Lotus Sametime unified communication delivers services such as location based presence, IM, Web conferencing, VoIP, video, persistent group chat, broadcast tools and instant screen sharing.

b) IBM Lotus Sametime Converged Communications

IBM Converged Communications Services provides a portfolio of integration, deployment, consulting and management services to build unified communications that can help organizations:

- Increase productivity with innovative collaborative environments using voice, data and video
- Reduce costs by streamlining networks and network management support
- Support a mobile workforce and distributed operations
- Transform legacy call centers into multichannel contact centers for improved customer service

IBM converged communications comprised of ten main market offers⁹ each delivers a set of services, from which three specifically support Lotus Sametime infrastructure:

1. Converged communication services for Lotus Unified Telephony – helps to implement communications-enabled solutions that enable users to connect to each other regardless of the private branch exchange (PBX) they are using. IBM delivers the necessary strategy, assessment, architecture, design, integration and deployment services to help

⁹ Converged communications for: IP contact center, managed IP telephony, network convergence, real-time collaboration, managed unified messaging, desktop video communications, managed tele-presence, Lotus Sametime

leverage existing and disparate multivendor telephony systems with a single user interface. Resulting cost efficient solutions ease complexity, speed communications and lower costs in delivering end-to-end solutions in complex environments.

2. Converged communication services for SIP infrastructure - offers a full range of services to build a SIP infrastructure through which companies can significantly reduce network costs, improve business flexibility and effectively manage users while more easily enable adding new voice, video and data communications.

3. Strategy and assessment services for UC as a service – UCaaS

Help customers to understand, prioritize and manage transition to the best UC alternative match with their organization's objectives. Using vendor-neutral approach, UCaaS provides roadmap and action plans for adoption of communication enablement as a service in order to reduce costs, improve collaboration and enhance productivity.

c) IBM Sametime Unified Communication and Collaboration environment (UCC platform with CEBP)

IBM UCC platform is a combination of three main market offers, each encompasses various feature and functionalities.

1. **Application Integration:** Sametime extend it's application productivity from UC with application integration capability inside a platform. The Sametime platform provides out-

of-the-box integration with many IBM and Microsoft collaborative applications¹⁰. This gives users quick and easy access to a complete set of collaboration proficiency without having to leave their preferred tools and applications.

2. **Communication enabled business processes:** The platform equipped with open-standards-based tools to help developers embed Sametime services into business processes. A software developer kit (SDK) features Web 2.0 and Eclipse-based rich client APIs.
3. **Standard based telephony integration:** Integrated with IBM Sametime Unified Telephony software, Sametime UCC also provides telephony via a middleware layer which supports connectivity to multiple telephone systems. The software connects via SIP to SIP-compliant PBXs from multiple vendors, connecting to legacy TDM phone systems through SIP gateways. Telephony features includes integrated presence awareness, soft phones, call control and rule-based call management.

Cisco CEAs:

a) Cisco Unified Messaging solutions

¹⁰ IBM Websphere Portal, IBM Lotus Notes, IBM Lotus Quicker, IBM Lotus Connections, Microsoft Office, Outlook and Microsoft SharePoint software.

Cisco's Unified Messaging (UM) solution, provides a secure, scalable and feature rich unified messaging platform which provides access to email, voice, and fax messages from a single inbox anytime, anywhere. UM allows employees to control their communications experience, maximizing their productivity and increase customer satisfaction. It is based on industry standards and seamlessly integrates with enterprise network and communication applications.

Providing employees flexibility in how they access information to increase their productivity and responsiveness to customers, Cisco UM allows to access voice messages from email inbox, a web browser, an instant messaging client and the telephone. The architecture authorizes integration with Microsoft Exchange, IBM Lotus environment, leading to manage only one user account for box email and voice mail to leverage the existing Active Directory infrastructure. Cisco UM supports legacy PBX systems and Cisco Unified Communications for a cost effective migration to full IP telephony. Cisco unified messaging solution includes a bundle of market offers, each suitable for a specified customer value segment:

- *Cisco Unity*: Unified messaging system for enterprise customers
- *Cisco Unity Connection*: Voicemail with speech recognition for small and medium size businesses
- *Cisco Unity Express*: Cost effective voice messaging router and Interactive Voice Response (IVR) for enterprise branches and small offices.

b) Cisco Unified Communications

To address today's business complexities, Cisco Unified Communications (UC) connects people, information, and teams, to enable inclusive and effective collaborative experiences.

Cisco Unified Communications delivers a highly secure experience across any workspace through

- Facilitating team interactions, bringing together individuals, teams and virtual workgroups
- Sharing video on desktop, mobile desktop and on-demand, as easily as making a phone call
- Making mobile devices as extensions of the corporate network so tele- workers can be more productive anywhere
- Innovate across the value chain by integrating collaboration and communications into applications and business processes

Cisco UC propose values such as shortening sales and customer service cycles, reduce time-to-market and the ability to respond to market changes faster.

Cisco Unified Communications solutions has a portfolio of four main market offers: unified communications applications, IP telephony, customer contact and unified communications management suite. Each market offer, itself is a bundle of featured products and solutions:

1. Unified Communications Applications

Cisco standard based UC applications can create adaptive online workspaces that produce productivity, agility, security and competitive advantage. The portfolio of Cisco UC applications includes

- I. Cisco Unified Personal Communicator which offers users voice, video, instant messaging, conferencing and presence information through a single application.
- II. Cisco IP Communicator and Cisco Unified Video Advantage which provides rich functions of IP phones, high quality voice and video calling.
- III. Cisco Unified Presence provide rich presence status and facilitates presence enabled communications.
- IV. Cisco Unified MeetingPlace is a voice, video and web conferencing solution for medium to large organizations. Also, an on-premise voice conferencing option for WebEx web conferencing.
- V. Cisco Unified Mobile Communicator enables real time collaboration by extending unified communication services to mobile devices and smart phones.

2. IP Telephony

IP telephony provides a secure way to extend consistent voice communications to all users by transmitting voice communications over the network using open standard Internet Protocol. IP telephony solutions unify voice, video, data, and mobile applications on fixed and mobile networks which allow let employees talk with each other using almost any media, device, or

operating system. Cisco IP telephony solutions includes two types of market offers: IP phones and call processing products, each encompasses various functionalities.

3. Customer Contact

One of the important factors in building a stronger business is to create a positive customer service. Cisco customer collaboration solutions can promote customer satisfaction and loyalty by transforming customer care from traditional phone transaction to collaboration experiences that are customized to satisfy the needs of individual customers. Cisco customer collaboration solutions can help companies to build competitive advantage, accelerate time to resolution and increase revenue opportunities and is comprised of five different market offers:

- I. Cisco Unified Contact Center Enterprise delivers intelligent contact routing, call treatment, network to desktop computer telephony integration (CTI), and multi channel contact management over an IP structure.
- II. Cisco Unified Contact Center Express provides complicated call routing and contact management for mid market enterprise branch or corporate departments, both formal and informal contact centers.
- III. Cisco Unified Customer Voice Portal delivers intelligent and personalized self service over the phone, using open standards for speech recognition as standalone IVR system or integrated with contact center.

- IV. Cisco Unified Expert Advisor improves first call resolution by allowing subject matter experts anywhere in the enterprise to handle customer calls without the need for rigid tools
- V. Cisco Unified Intelligence Suite is a dashboard based reporting platform where data can be integrated from multiple sources offering an inclusive view of contact center statistics.

4. Unified Communications Management Suite

Cisco UC Management suite incorporates network management applications that are optimized for delivering a complete provisioning, monitoring and reporting. The suite is a bundle of four market offers as follows:

- I. Cisco Unified Provisioning Manager accelerates initial implementation of Cisco UC as well as reducing the complexity of operational provisioning and activation services.
- II. Cisco Unified Operations Manager performs automatic discovery for the entire UC system and provides conceptual diagnostics for rapid trouble shooting.
- III. Cisco Unified Service Monitor continuously monitor active calls supported by Cisco UC system, providing real time notification when the voice quality of a call fails.
- IV. Cisco Unified Service Statistics Manager is a web based software product that provides a variety of advanced but easy to use executive and operational reports to facilitate capacity planning and budgeting.

c) **Cisco Unified Application Environment**

Cisco Unified Application Environment (UAE) provides unique Unified Communications application platform which provides total control over IP communications required to integrate voice into business applications and processes. It combines configurable interfaces (designed to easily interface with business applications) with built-in capability to control the communication, collaboration and media services offered by Cisco UC. Cisco UAE integrates all Cisco Unified Communications APIs, and provides user-friendly toolkits to enrich business applications with network services. Cisco Unified Application Environment can play a vital role as a productivity and agility enabler in the enterprise through eliminating communication and collaboration silos that slow down business processes. With the Cisco Unified Application Environment, organizations can deliver specific software functionalities with customized solutions supporting far more elaborate integration of unified communications capabilities into a Communications-Enabled Business Process (CEBP). For instance, developers have used Cisco UAE to create customized applications that support a number of advanced IP telephony functions including mobility, recording, radio frequency identification (RFID) tagging, video conferencing and speech-enabled applications. The Cisco Unified Application Environment consists of three basic market offers:

1. **Cisco Unified Application Server:** An extensible framework that provides the runtime environment for applications and abstracts the wide variety of telephony protocols supported with Cisco Unified Communications.
2. **Cisco Unified Application Designer:** A visual integrated development environment (IDE)

crafted specifically for rapid creation of converged voice and data applications.

3. Media Engine: Supplies ready-to-use, sophisticated media processing functions such as advanced prompt processing, advanced conferencing, text-to- speech, and speech recognition for all applications using Cisco Unified Application Environment.

d) CEBT service delivery platform and partner ecosystem

Collaboration enabled business transformation (CEBT) is a business and technology approach similar to communication enabled business processes (CEBP), which aims to remove system and employee delays. Three main functionalities differentiates CEBT platform from CEBP:

1. CEBT platform delivers on demand, cloud based services by what is proposed in the industry as CEBPaaS¹¹. The CEBT service delivery platform's initial focus is responding to business events that needs on demand human intervention through a set of voice and video-enabled, multi-channel, notification services. The platform is structured on a cloud computing model providing flexibility, cost reduction and business performance optimization.
2. Extensibility is the second critical property of CEBT platform, which means the platform can incorporate services from other Cisco certified technology partners. Integration of partners constitutes a "supercloud", delivering an expanded set of on demand CEBT services. CEBT partner ecosystem incorporates Cisco certified technology partners¹²

¹¹ <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=05357084>

¹² Appian, BackFlip Software, Cast Iron/IBM, Intelepeer, Librestream, Pegasystems, PNMsoft, VocalMash, etc.

specializing in Business Process Management (BPM), Extract Transform and Load (ETL) and voice and video transport service provisioning. CEBT platform also expands notification modalities with Cisco collaboration capabilities such as video streaming on demand and video based web conferencing.

The foundation of the platform is a cluster of voice and video control, contact center, and policy/role access components which reside in the cloud for on-demand consumption and the growth of it is based on core competency and to what extent the partners are well organized for the secure, cloud based interconnect. No more details on the categorization of CEBT platform market offers are released by the time period of the data gathering for this thesis.

Microsoft CEAs:

a) Microsoft Unified Messaging

Cisco Unified Messaging (UM) combines voice messaging, fax and e-mail messaging into a single messaging infrastructure that can be accessed from many different devices. Microsoft Exchange Server is the key technology and the foundation for delivering voicemail functionality to improve productivity while helping to reduce the cost and complexity of the voicemail system. Microsoft UM rely on functionality of two main market offers: Microsoft Exchange Unified Messaging (UMservice.exe) and Microsoft Exchange Speech Engine (SpeechService.exe) and Service Control Manager as a support that monitors both services and their related processes.

The Microsoft Exchange Unified Messaging service lets voice messages be stored in an Exchange mailbox and gives users telephone access to e-mail, voice mail, calendar, and contacts.

The Microsoft Exchange Unified Messaging service performs the following functions:

- Retrieves the dial plan configuration from the Active Directory service
- Loads the configuration information for monitoring UM worker processes
- Initializes the UM Worker Process Manager and the startup of a UM worker process
- Registers SIP endpoints

Microsoft Exchange Speech Engine is an Interactive Voice Response (IVR) platform which provides speech recognition capability that is used to recognize user inputs and provide TTS capabilities. This platform controls the touchtone interface, Automatic Speech Recognition (ASR) and Text-to-Speech (TTS) engine that reads e-mail, voice mail, and calendar items and plays the menu prompts for callers.

b) Microsoft Unified Communications

Microsoft Unified Communications solutions harness the power of software to make it easier for people to communicate regardless of their location. These technologies allow companies to adapt to evolving business requirements with a secure and extensible platform which extends the different ways people communicate, including e-mail, telephone, conferencing, voice mail, and instant messaging. Microsoft UC technologies help businesses streamline and protect

communications, build a future ready foundation for communications and increase efficiency and reduce costs.

Microsoft UC is the combination of six market offers, from which the first two are the basics:

1. Microsoft Office Communications Server (OCS)

Office Communications Server combines and manages all synchronous communications including instant messaging, VoIP, presence, audio/video (A/V) conferencing, and telephony solutions that can support enterprise-level collaboration requirements in a fully integrated unified communications solution.

2. Microsoft Exchange

With Microsoft Exchange Server (latest version of 2010) organizations can achieve new levels of reliability and performance with features that simplify administration, help protect business communications, and delight users by fulfilling their demands for greater mobility.

Microsoft Exchange Server, the cornerstone of Microsoft's Unified Communications solution, is a reliable and flexible messaging platform which can lower messaging costs, increase productivity with anywhere access to business communications, and safeguard the business with protection and compliance capabilities.

3. Microsoft Office Communicator

Office Communicator provides a streamlined communications experience, offering easy connectivity for users regardless of their location and communication method. With rich

presence awareness, software-powered voice capabilities, enterprise-class instant messaging (IM), multi-party audio, video and desktop sharing, and integration with Microsoft Office applications, users can collaborate from any location. Also, with the ability to integrate with Office Communicator, all incoming calls find their routes to voice mail.

4. Microsoft OCS Speech Server

Microsoft Office Communications Speech Server is a comprehensive IVR platform for powerful speech-enabled self-service applications. The platform consists of a server with built-in speech recognition and speech synthesis software that can be used for speech-based solutions, with a comprehensive speech application toolkit. Based on the .NET platform, Speech Server applications easily integrate with various end points using ADO.NET or Web Services. Speech Server also includes a powerful business analytics tools which can provide clear insight into how enterprise solutions are performing and where the enterprises should drive process improvements.

5. Microsoft Live Communications Server

Live Communications Server 2005 is predecessor to Microsoft Office Communications Server 2007. It delivers Presence information and corporate instant-messaging through Microsoft Office Communicator 2005.

6. Microsoft Office

Microsoft Office is designed to take full advantage of Microsoft unified communications technologies. Presence technology appears throughout the Office system, from Document Workspaces inside Word, Excel and PowerPoint to team sites and My Sites on SharePoint Servers.

c) Communications enabled business process platform (CEBP)

Microsoft Lync platform is the latest type of unified communications which delivers a connected rich user experience transforming every communication into an interaction that is more collaborative, engaging and accessible. It provides a single unified but extensible platform that integrates voice communications, IM, A/V web conferencing, into more contextual offerings. Besides values such as connected user experience, unified interface and extensibility, the ability to integrate new communications tools into specific enterprise operations and business processes which ¹³ is the key differentiation of Lync platform.

Key functions of Lync server platform includes five bundles of market offers:

1. Instant Messaging and Presence

Microsoft Lync provides users real time presence information and advanced IM to assist them connect more efficiently and effectively. Through lync platform users get richer presence

¹³ the term “CEBP” was coined by Gartner in 2003, summarized as “Integrating communications and collaboration with business processes offers opportunities for considerable benefits. The methods for developing these applications matured along with unified communication solutions.

information to stay connected, get instant information with contact cards, connect instantly with IM session, connect with outside of the organization with server-to-server federation capabilities and provided with unified contact lists.

2. Audio/Video and Web Conferencing

Lync Conferencing market offer creates, moderates and join ad hoc collaboration sessions and online meetings with internal and external users. It brings a richer, single client experience to users, control conference participants activities, ease scheduling and joining conferences and ease anywhere access while maximizing the value of existing investments and reduce costs.

3. Mobility

Lync platform delivers connectivity from anywhere across PC laptops, browsers, telephones and mobile phones. Lync Mobile extends global address list (GAL) support, instant messaging, contact lists, and the ability to join scheduled conferences to mobile phones. Lync users can also transfer a call or audio conference from their PC-based Lync client to their phone or mobile phone without disrupting the conversation.

4. Enterprise Voice

Lync enterprise voice combines the telephony features of traditional PBX with rich presence, instant messaging and conferencing to improve communications and reduce costs. Key features of this market offer rather than traditional calling features are Call Coverage, Call Queuing and

Routing, Choice of Endpoints and Anywhere Access in order to support a safer workplace, maximize ROI and minimize disruption.

5. Group Chat

Microsoft Lync Group Chat allow users to have topic based, multi-party discussions that can improve communication, broaden information awareness, manage information flow and enhance monitoring capabilities.

Appendix 8- Revised Business Model Canvas

BM Canvas is the selected construct for this research to provide a model of the data required to perform the analysis of business models and business model innovation. The revised version of the Canvas used in this research consists of nine building blocks:

1- Customer Value Segments (CVS)

To better satisfy customer needs, a company segments them into distinct groups based on the value that they can get from company's market offers. Once a company makes the decision about which segments to serve and which to ignore, a business model can be designed upon strong understanding of specific job need to be done. In the revised version, segmentation is performed by the value.

2- Customer Value Proposition (CVP)

The value proposition building block describes products/services that create value for each customer segment. A focused customer value proposition is the keystone of powerful business models. First step to design a CVP, is to develop a comprehensive understanding of the various dimensions of the customer's job to be done. Next step is to verify market offers that fulfill that job in a unique way. Identified CVPs for sample companies in this research, follows these two steps and is based on Anderson et al. (2006) illustration of CVP in terms of points of parity, points of difference and resonating focus.

3- Customer relationships

This element describes different types of relationships a company establishes with customer in each value segment. The customer relationships called for by a company's business model deeply influence by the overall customer experience.

4- Channels

The channels describes how a company reaches it's customer segments and communicates with them to deliver company's value proposition. Channels play an important role in raising awareness among customers about company's product/services, helping customers to evaluate company's value proposition and provide after sales customer support.

5- Cost structure

All activities related to create and delivering value to customers under any type of business models incur costs. Such costs can be calculated relatively easy after identifying key resources, key activities and key partnerships. The cost structure is simply made of direct costs and overhead, taking into account economies of scale. Despite the natural tendency of any business to lower costs, low cost structures classify business models into two broad categories: Cost driven and value driven.

6- Revenue streams

The revenue streams represent the cash a company generates from each value segment.

For the value that each customer segment is willing to pay, the company, can generate one or more revenue streams for each CVS. Each revenue stream may have different pricing mechanisms.

7- Key resources

The key resources block indicates most important assets required to make a business model work. These resources enable companies to create a compelling value proposition to the customers, main customer relationships with value segments and earn revenues. Key resources can be physical, financial, intellectual or human related and might include the unique people, technologies, products, facilities, equipment, funding and brand required to deliver the value proposition to the customer.

8- Key activities

Every business model operates with a number of key activities which are the most important activities a company takes into action. Key activities are those recurrent, critical tasks that must be delivered in a consistent way to serve the customer value proposition and profit formula.

9- Key partnerships

The network of suppliers and partners are becoming a cornerstone of many business models. Alliances between non-competitors, strategic partnerships between competitors and

complementors, mergers and acquisitions and buyer-supplier relationships to assure reliability are most common types of partnerships.