A Study of Responsiveness and Agility for Networks of Collaborators

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Abstract

This research investigates the governance structures of collaborative networks to gain an insight into their functioning. The focus is on the factors that the collaborators view as important in their pursuit to achieve agility and responsiveness in their business models.

Due to the exploratory nature of this research with the constraints of time, a qualitative research based on the multiple case study has been undertaken to find the answers to the research questions. Towards this objective, the research investigates four cases of collaborative networks that use ICT. The semi structured interviews constitute the primary source of data collection.

The following are the main findings of this thesis, which are highlighted as follows:

1. It has concluded that effective communication is an essential requirement for the success of a CN project.

2. The thesis has validated a commonly held notion that skills and expertise in a specialised area is an essential ingredient for success in a network.

3. The thesis findings point to several factors that lead to achieving agility and responsiveness of business model for the participating organisations. Many of these factors are in conformity with earlier published work, thereby validating those.

4. The thesis has defined the factors responsible for achieving BM agility and an optimum level of responsiveness for a network of multiple (more than two) collaborators, from which the desired characteristics of an Agile and Responsive Business Model may be determined.

Business model agility was also studied across the two different structures of networks. The first of these is the unbundled structure that relates to each of the collaborators working on their units of work. The other type is the vertically integrated, which deals with more tightly coupled organisations. The case studies were used to determine the impact of different modes of governance and network configuration on partner flexibility. As a result of the data analysis during the research, five distinct themes have emerged. Some of the themes are similar to those reported in earlier studies, thus validating them.

Past studies on collaborative networks for the research areas, similar to this study are found to be scarce. Therefore this study has added to the body of knowledge for collaborative networks that aim to achieve responsiveness and agility of their business models.

In the concluding chapter, the answers to the main research questions have been provided and the contribution of this thesis is discussed. Finally the limitations of the study, with the recommendations for further research areas that this study has opened up is discussed.

Acknowledgements

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List of Abbreviations

- **TAP** – Txt A Park

- **HI** – Health Insurance

- **SIM** – SIM Project

- **BD** – Bag Drop Case

- **SME** - Small and Medium Enterprise

- **CN** – Collaborative Network

- **MPSP** – Mobile Payment Solution Provider

- **ICT** – Information and Communication Technology

- **Telco** – Telecommunications Company

- **MVP** – Most Valuable Product

- **MMS** - Multimedia Messaging Service

- **MNO** – Mobile Network Operator

- **MBSP** – Mobile Business Service Provider

- **MS** – Microsoft

- **MS.Net** – Microsoft .Net platform

- **ASP** – Active Server Pages

- **C#** - High level application development language by MS

- **SQL** – MS Structured Query Language

- **SW** - Software

- **IPP** - Infrastructure and Platform Provider

- **ICTG** - ICT Governance

- **QOE** - Quality of Experience

- **SLA** - Service Level Agreement

- **RDBMS** - Relational Database Management System

- **API** - Application Programming Interface

- **RFP** - Request For Proposal

- **CSF** - Critical Success Factor

- **BA** - Business Analyst

Attestation of Authorship

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person (except where explicitly defined in the acknowledgements), nor material which to a substantial extent has been submitted for the award of any other degree or diploma of a university or other institution of higher learning.

KAUSHIK ROY CHOWDHURY

Chapter 1

Introduction

1.1 Background

Over the last decade, there has been a very rapid development in the field of wireless broadband with fast to ultra-fast speed using fibre optics. There has also been a corresponding emergence of hardware as well as operating system software keeping pace with the evolution of the wireless and ultra-fast broadband. The development of mobile technologies have also kept pace along with the speed of development of wireless. The popularity of wireless networks has opened the doorways to the participation of mobile devices (using m-commerce) in various information and communication technology (ICT) enabled services. This fact has resulted in a huge range of mobile devices and a large number of applications deployed over a faster and progressively cheaper mobile broadband [1]. The mobile device segment, as a result, has grown very rapidly, bringing forth significant market opportunities for collaborative networks that use ICT as the means to conduct business. Consequently, an expectation for the future growth of ICT enabled services and solutions in current and developing markets that involve multiple organisations embedded in a collaborative network has surfaced. Already, many organisations are involved in implementing ICT enabled services in their daily operations to benefit from the latest developments in the field as well as to fulfil the ever increasing customer expectations. Many more organisations are planning to enter into a partnership or some form of collaboration with others to exploit ICT delivery of their products and services. These collaborative networks have the advantage of mutually sharing the benefits and learning from each other's experiences in just about any facet of the service on which they collaborate.

The purpose of this research is twofold:

1. To evaluate governance structures of collaborative networks (a network of collaborators; here forth coined as CN) for achieving an optimal level of responsiveness of their business models. The need for doing so arises out of the objective of achieving synergy from the activities of various stakeholders. Consequently, the network generates sustainable business propositions that make all the network partners and customers remain interested and engaged over an extended period in the CN products or services.

2. Study and analyse the effects of level of vertical integration vs. unbundling in CN's for achieving the business model agility.

Technology governance is the key to driving effective IT management processes that can position the organisation to better exploit the business potential of IT. Typically governance has so far been restricted mainly to a single organisation [2]. To date, little research has investigated technology governance in practice within a collaborative network that involves more than two organisations through the utilisation of IT [3, 4]. It is an important aspect as many organisations are moving into collaboration due to a competitive and turbulent business environment. In the 20th century, technology governance was largely about standards and centralised management. With the arrival of the new millennium, things began to change, first from centralised to federated technology governance models, then to "participatory" models. Commoditisation, consumerisation, and alternative technology delivery models changed the way governance is defined and managed in many, though not all, companies. For many of them, the number of technology stakeholders has increased as the importance of technology has expanded to include at least three categories of governance: operational, strategic, and emerging technology. For many companies, the governance mission is evolving toward a shared, participatory model that recognises the roles of all internal and external stakeholders, especially as companies acquire, deploy, and support technology through the "cloud" and supply chains globalise and integrate [5]. As such, the first objective of this study is to enhance our understanding of IT governance in a collaborative network. A business model [1] is described as a blueprint of the way a business creates and captures value from its services, products, or innovations. The concept also defines how a firm interacts and transacts with customers, partners, and suppliers. A business model converts technological characteristics and potentials to economic outputs [1], thus directing technology investments towards profitable and sustainable economic value creation. A business model is a method by which a firm builds and uses its resources to offer a better value to the customers than its competitors, and in so doing makes money.

A critical part of the business model analysis is the determination of the sources of revenue. A business model can be described by answering a few simple questions such as [1]: Who is the customer? What does s/he value? Moreover, how can money be made out of business? Fundamentally a self-sustaining or viable business model can be one that maximises the value proposition [1, 6] among customers at an appropriate cost. The maximisation of value proposition increases the willingness among customers to pay, which generates the profit to keep the business sustainable. Since there are stakeholders, there needs to be a more efficient strategy for building business models that can achieve synergy with regards to the services and responsibilities, thus generating business propositions that sustain the relationship. In the present era of competitiveness and cutting edge technology, the viability of organisations depends on the flexibility of their business models to respond to external changes in the environment. However, complexity arises out of the multiplicity of organisations with their diverse abilities all enmeshed into a network. This complexity makes it difficult for them to respond quickly to environmental changes. There lies the importance of governance of such a structure which will give the business model the ability to respond swiftly and positively.

1.2 Motivation

One of the motivations for this research is to investigate the way collaborators in a value chain act together for achieving a successful business model using advances in ICT as well as mobile technologies. The research then goes one step further to study and explore the various governance structures adhered to by the network that makes its business model responsive. A highly influencing and motivating factor was to explore and investigate causes that lead to the success in business through collaborative efforts of a network of partners, their co-existence, profiting from each other and the experience gained from the business. This motivation gradually evolved over time when a similar but smaller scale Txt A Park project of the City Council to study the revenue model and commercial feasibility factors [7] was carried out. In that research project, as a result of the data analysis, a common pattern seemed to emerge that indicates the ingredients of success for such a collaborative venture.

The huge gaps in the knowledge and understanding of governance of an ICT enabled service of a collaborative network with a large number (more than two)

of collaborators [3, 4] is a significant motivating factor. The effort towards this area of research will at least partially satisfy the intellectual curiosity to get some insight into aspects of ICT enabled service governance. The studies in this area is an ongoing and ever growing process due to emerging technology developments in service delivery, information management and security.

It is believed that the success factors necessary for a CN business model are in some way related to how a network of collaborators is governed. This study will also attempt to address or at least lead the way to future research to investigate this relationship between success and type of governance of a collaborative network.

For goal-directed organisational networks with a distinct identity, some form of governance is necessary to ensure that participants engage in collective and mutually supportive action. The governance ensures that network resources are acquired and utilised efficiently and also conflicts are resolved between the CN partners amicably. Although all networks comprise a range of interactions among participants, a focus on governance involves the use of institutions and structures of authority and collaboration to allocate resources and to coordinate and control joint action across the network as a whole [8].

The research may help organisations understand the ingredients of starting and sustaining similar ICT enabled business ventures and the factors that may influence long term engagement among the members of the value chain. The present research will be useful to fill the gap between existing evidence available on the effect of various types of ICT governance on the business models of a network of collaborators, and the demand to find an efficient structure. The research encompasses relevant cases some of which have stood the test of time and opens up opportunities for further research [7].

The participating collaborators stand to benefit from this research by way of gaining an insight into relevant elements of an effective ICT governance strategy within a collaborative network (of more than two organisations) as they will receive a summary of the findings of this research. The little understood factor of the level of vertical integration vs. unbundling in collaborative networks is investigated and analysed, bringing out the desired combination of the two models for making a business model agile. All collaborative network organisations stand to benefit from this research as it will attempt to explain two of the biggest challenges faced in the governance of such an ICT enabled service. These challenges are:

1. The ways to govern a CN to achieve an optimum level of responsiveness.

2. To achieve the right combination of integration vs. unbundling for business model agility for an ICT service.

1.3 A well-established collaborative network Using ICT for parking reservation

An example of an ICT enabled service used by a collaborative network is shown in Figure 1.1. The Txt a Park (TAP) solution of TAP-A is a good example of
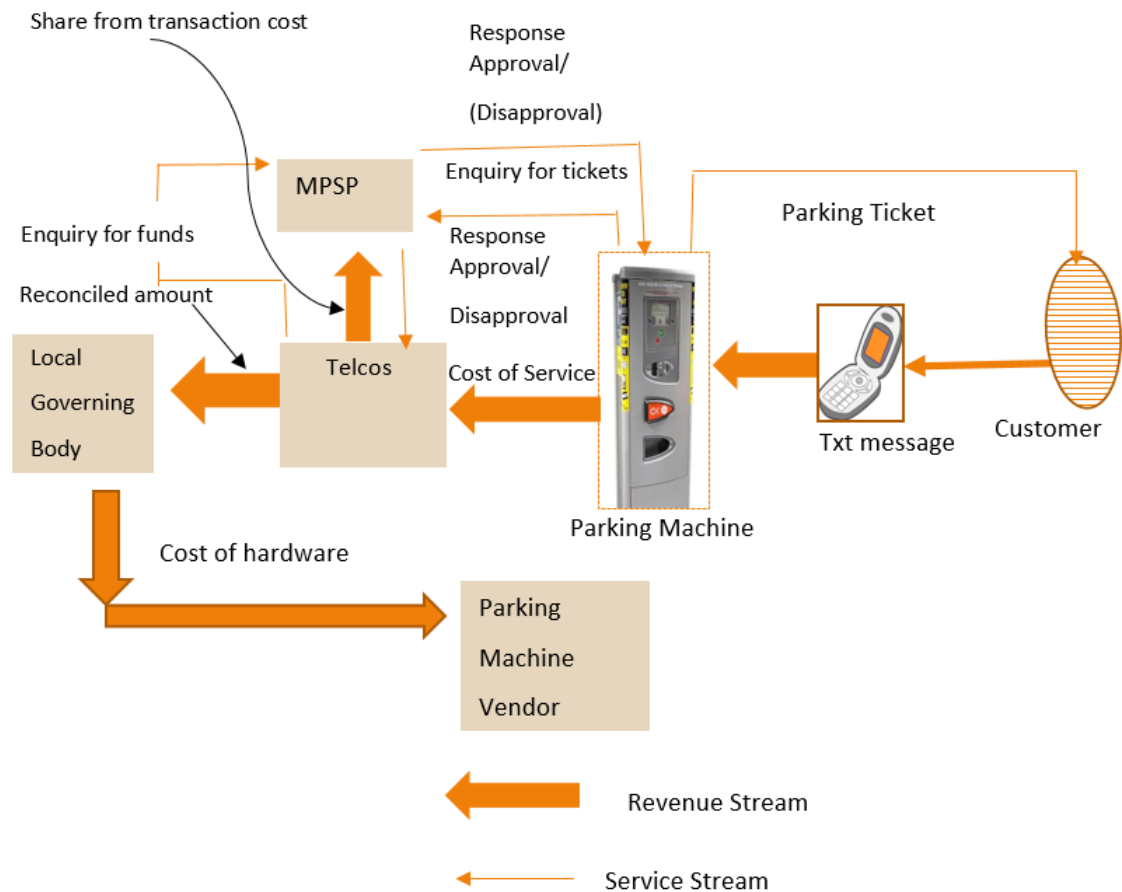
FIGURE 1.1: Schematic representation of TXT A PARK service showing the service and revenue streams

a case that fits the criteria. This service has been in existence since 2004 and is a typical example of how collaborative networks that use an ICT enabled service using mobile technology can work for a shared goal and achieve success. The TAP

system works as follows: The customers presses Txt A Park at the vending machine and sends an SMS on his mobile with the parking machine number with a short code corresponding to the time in hours they need to park to a designated number printed on the machine. The enquiry for tickets is sent to the mobile payment solution provider (TAP-C), who also request and receive information on customer funds from the telecommunication carriers TAP-B. Based on the availability of funds or other technical reasons, they approve/disapprove as response and accordingly the parking ticket is either printed on the parking machines or reason for non-delivery is displayed on it. An SMS is also delivered on the customer mobile. There are four key collaborators in this value chain, namely:

1. Telecommunication companies (TAP-B, TAP-C).

2. Local governing body (TAP-D).

3. Mobile Payment Solution Provider (TAP-A).

4. Parking machine vendor and maintenance provider (TAP-E).

This research is intended to further the investigation into the viable business model proposed by Sharma and Gutiérrez [1], and also to enhance the scope to any suitable ICT enabled service by a network of collaborators (not restricted to mobile commerce). The means to achieve this is through the study of governance of such networks to get a suitable insight into the agility and responsiveness of their business models. This study may prove to be of further interest since the new cloud-based, technology delivery models and proliferation of "consumerised" devices have completely changed the governance equation [5].

In a network of collaborators, contrary to traditional value chains, some organisations will be co-operating to create a value network in which each collaborator contributes its skills and resources as per the demand. Collaborative network business models are very different and much more complex than strategic alliance in other IT sectors like communications.

1.4 Thesis Organisation

This thesis consists of seven chapters as follows:

1. Introduction.

2. Literature Review.

3. Research Objectives, Methodology and Design.

4. Case Studies.

5. Cross-Case Analysis of Themes.

6. Cross-Case Analysis of Sub Questions.

7. Discussion and Conclusion.

The Chapter 1 introduces the research topic and the main research objectives. It serves as an insight into the gaps in research in this area, a part of which this project aims to address. This chapter covers the motivation for the research and concludes with an example that has been included as one of the cases which have been treated in the section on case studies.

The Chapter 2 covers a detailed review and analysis of the existing academic literature that has been consulted in the process of gathering an in depth knowledge on the research topic. The review has provided the necessary foundation to design the research methodology and has also provided some groundwork to form the interview questions. These interview questions were used in the data collection stage. They are the same as the research sub-questions for this study and can be used interchangeably. The literature review was based as detailed by [9], who suggest that it should address the following issues:

- What research has been carried out that is relevant to the present study?

- What were the main conclusions to be drawn from previous research?

- What were the methods employed by previous studies?

- How (conclusions and methods) are previous studies similar?

- How (conclusions and methods) are previous studies different?

- Where are there gaps in knowledge?

This chapter is concerned with selecting the most appropriate sources of literature and discussing them in a manner that demonstrates the importance of the researcher's own findings.

The Chapter 3 is dedicated to the research methodology and design. The research questions to be answered by the case studies are reflected in the research design. The chapter represents a practical plan [10] for the methods to be used, incorporating areas such as data collection and analysis - which is drawn in accordance with the decisions that have been taken about methodology (e.g. to use a case study based qualitative approach). This chapter provides the research sub-questions based on the main questions. These sub-questions have been used as interview questions and designed for ease of data collection, correlation and analysis. The sub-questions put together are aimed to address the bigger research questions. The chapter also highlights the steps in the research process.

The Chapter 4 discusses all the four cases in the multiple case; case study approach. It is an exhaustive chapter that deals with the cases that were interviewed during the data collection stage, and it offers the reader a practical insight into them. This chapter presents an organisational overview of the major stakeholder and other partners in the network. It is also intended to enlighten the readers about the functional aspects of these organisations and delves into detail to describe various processes. The research findings and the conclusion drawn from the cross-case analysis are based on the responses gathered from these cases.

The Chapter 5 builds on the cross-case analysis of the thematic data. Themes have emerged as a result of pass one and pass two of the data analysis stage, using the open coding method [10] of qualitative research. Five themes have thus emerged which have been subjected to cross-case analysis. The chapter deals with the mechanism of emergence of the themes and codes. Throughout the chapter, comparison of cases have been carried out to find matching patterns across cases that may prove a point conclusively, and in doing so, produce new insights into the area. Summarised results of the analysis are also presented in a tabular form, that is intended to provide a quick reference to the thematic analysis.

The Chapter 6 is dedicated to the cross-case analysis of sub-questions of the two research questions, Q1 and Q2. This chapter lays the foundation for finding the answers to the main research questions. The summary of cross-case analysis for each of the sub-questions is believed to present the reader with a quick overview of the responses. They help in promptly identifying lack of adequate data or evidence from cases. In doing so, they help in figuring out if any point is inconclusive, and subject to further research.

The data collected from the sub-questions were placed in five categories, which

were decided by the main research questions to answer. The codes are labels that fit a particular definition (Appendix 4) emerging from the analysis of the data from these categories. The themes resulted from a grouping of similar codes to fit the theme (e.g. Core Offerings is a theme, which includes the codes: Functionality and Compliance). It may be therefore be concluded that there exists an indirect link between the findings in the previous two chapters.

The Chapter 7 is the last one and is on discussion and conclusions. It presents a synopsis of the answers or findings to the main research questions Q1 and Q2, which are based on the data analysis of the sub-questions carried out in Chapter 6. It brings out the highlights and the limitations of this work and also the areas of further research in future.

Chapter 2

Literature Review

2.1 Introduction

In this section, selected works on CN, ICT governance, business models, agility and responsiveness are reviewed. These works are intended to provide a real insight into the topic of the research and show the various interdependencies between them to tackle a complex subject. The knowledge gained during the review proved to be beneficial in forming a research design and methodology and the formation of interview questions during the data collection stage.

Since the entire research revolves around organisation business models, it could provide a starting point in the literature review stage. From a broad perspective, a business model is a blueprint which the organisations follow to create and capture value from its services or products [11]. A business model converts technological characteristics and potentials to economic outputs, thus directing technology investments towards profitable and sustainable economic value creation [12]. In reality, business models are dynamic in nature and do not last forever [13]. Given the external changes in their business environment, organisations need to reinvent their business model frequently in order to keep it sustainable. Choices made during the establishment of the initial services, processes and underlying technology normally change during consecutive stages of the market roll out and commercial exploitation [14]. Therefore, a sustainable business model is one that not only liberates the concealed potential of technology but consistently searches for new alternative models and emerging innovations which are usually brought about by new technologies.

2.2 Collaborative network and ICT governance

2.2.1 Collaborative networks explained

According to [15], a collaborative network (CN) consists of different entities (e.g., organisations and people) that are largely independent and heterogeneous regarding their operating environment, culture, and objectives. Nevertheless. these entities collaborate to achieve better, common or compatible goals, and whose interactions are supported by a computer network. Unlike other networks, in CN, collaboration is an [16] intentional property that derives from the shared belief that together the network members can achieve goals that would not be possible or would have a higher cost if attempted by them individually. Presently, collaborative networks are using various information and communication technology (ICT) tools and means such as the Internet, intra-nets, extra-nets, knowledge portals, group decision support systems and electronic meeting systems to support their collaborative relationships and to enable them to be more flexible and more networked [17]. The benefits derived from using the advances in ICT services resulting in a growing trend of their usage are [17, 18]:-

1. Reduced communication costs as the exploitation of audio and video conferencing and web conferencing enable communication without face-to-face interaction.

2. Enhanced facilitation of knowledge sharing.

3. Increased innovation as ICT improves organisational communication, including the collection, integration, transfer and application of employees' knowledge, amplifying the knowledge base available and its utilisation.

4. Enhanced decision making as the exploitation of decision support systems, electronic document management and electronic meeting systems facilitates better and quicker decision making related to the allocation and utilisation of resources and other organisational strategic issues, ultimately leading to an enhancement in decision quality, better utilisation of resources and administrative efficiency.

Public and private sector organisation, both tend to participate in networks [19] to gain access to knowledge, skills and resources of other organisations which they either do not want to possess on their own or are out of reach. They can achieve

difficult and complex goals that they are unable to attain on their own [19] by collaborating in these networks. Individual organisations play a different role in these networks, which are continually changing shape as organisations enter or leave the network. Thus networks are dynamic in nature and subject to constant changes.

Governance is necessary to deal with a wide variety of situations in networks, which can take the form of operational execution but can also be related to the willingness to share crucial data with each other and the handling of conflict [19]. Organisational and national contexts provide potential for conflict [20] and governance mechanisms are necessary to handle a wide variety of issues. To understand the creation and evolution of governance mechanisms, it is essential to know the problems that need to be tackled by those mechanisms. The reason for this is that challenges and their governing mechanisms, both change over time.

2.2.2 Information technology governance for collaborative networks explained

Various definitions of IT governance have emerged from the three characteristics of IT governance effectiveness. The typical definitions of IT governance are:

- IT Governance Institute emphasises that the Board of Directors and executive management are responsible for IT governance of an organisation. This management structure is an integral part of the enterprise governance. The governance consists of the leadership and organisational structures and processes. This ensures that the organisation's IT sustains their strategies and objectives [21].

- Weill [22] defines that IT governance details the framework for decision rights and accountabilities with a view to encourage desirable behaviour in the use of IT.

- Peterson [23] characterises IT governance as the authorisation of decision-making rights and responsibilities among stakeholders in a CN. The governance also specifies the procedures for creating and monitoring strategic decisions in regard to IT.

- Webb [24] defines IT governance as the strategic IT and business alignment. This alignment ensures that maximum business value is accomplished through

the development and maintenance of effective IT control and accountability, performance management.

Technology governance, as in all aspects of corporate governance, concerns decision rights often organised in responsible/accountable/consultative/informed, or RACI, play-books that describe who is allowed to acquire, deploy, and support business technology [16, 25]

Types of technology governance with its evolution [5] are listed below:

- Centralised: In centralised IT organisations, decision rights involved in the acquisition, deployment, and support of technology belong to a central group reporting to a corporate executive, mainly the CFO. In other words, corporate information systems (IS) has the authority in making any IS related decisions. It is understood that Small and Medium Enterprise (SME) is more functionally structured therefore it is more feasible to have a central IS organisational body to make all IS related decisions.

- Decentralised: In decentralised organisations, decision rights are shared across the enterprise and business units. The divisional IS and line managers have the authority in making any IS related decisions. It would be more feasible for a large multi-international organisation to adopt a decentralised IT governance mode. This type of governance offers more flexibility than the centralised type.

- Federated: In a federated model of governance, decision rights are coordinated across the corporate IT group, the business units, and even specific corporate functions.

- Participatory: This is the modern day and emerging governance mode and is suited for collaborative networks. Participatory model recognises the roles of all internal and external stakeholders, particularly since companies acquire, deploy, and support technology through the "cloud". It reflects the distribution of decision rights across multiple external and internal participants. Participatory governance acknowledges expansion of the number of governance stakeholders, commoditisation of technology, consumerisation, and the increasing practice of outsourcing operational, strategic, and emerging technology.

The technology governance has changed over time in the last 2-3 [5] decades resulting in the evolution of participatory governance which is a shift from the more traditional centralised, decentralised or federated governance. As per another paper

[26], adoption of a federal governance structure is more appropriate for a collaborative network. It is suggested to identify a governing body at the start of the collaboration to regulate the steering committee. Importantly, such governing body needs to establish a coordinated communication process to assimilate and disseminate IT governance policies and procedures to the collaborative partners. Continuing on the path of the evolution time line over the last quarter of a century, enterprise CIOs encountered the "technology standardisation". They started believing that even if the lines of business had some control, so long as they controlled the technology standards around primary devices: servers, desktops, and communications, they were still essentially in charge. This belief was despite the fact that they did not select every one of the organisation's business applications. The centralisation/decentralisation/federation game persisted until the Web arrived in the early 1990s, when control was influenced by technology "consumers" who no longer viewed themselves only as end users. Following the dot-com crash of 2000, governance returned to operational cost control, staying that way until 2003 when technology budgets began to increase again [5]. In the mid-2000s, governance changed again when it was shared by enterprise CIOs and business-unit CIOs (assuming the structure recognised business-unit CIOs) or just "business-unit technology directors". Companies continued on this path until the financial world melted down again in 2008, and governance changed again. It was centralised in the hands of a few or even just one senior executive(s), the CFO, the COO, or, infrequently after 2008, the CEO [5].

Essential ingredients for an efficient network governance: Relationship-specific processes need to be designed and implemented in business networks [27]. Also the use of contracts and agreements are necessary [19] to formalise expectations. Nevertheless, collaboration in networks is often based on trust. Contracts and formal agreements, are no substitute for trust as not everything can be covered in such agreements and overly strict contract provisions might result in self-serving strategic behaviour. Too much detail in a contract might even block instead of facilitating the collaboration. When cooperating in networks, an organisation must not only govern and manage its internal operations, but it must also arrange and manage participation in multi-organisation networks. The complexities, interdependencies and dynamics encountered in governance complicate decision making as responsibilities might shift, decisions made by one organisation might impact other organisations, the consequences of such decisions are often not clear, and there is often no uniform way of making network level decisions [19]. The main players have

to interact with each other, resolve possible conflicts and negotiate about desired outcomes. Although often no formal governance processes exist to include new players in the network, networks can and do evolve as new organisations join and others leave. In this way, the organisational network co-evolves over time with all kinds of internal and external changes.
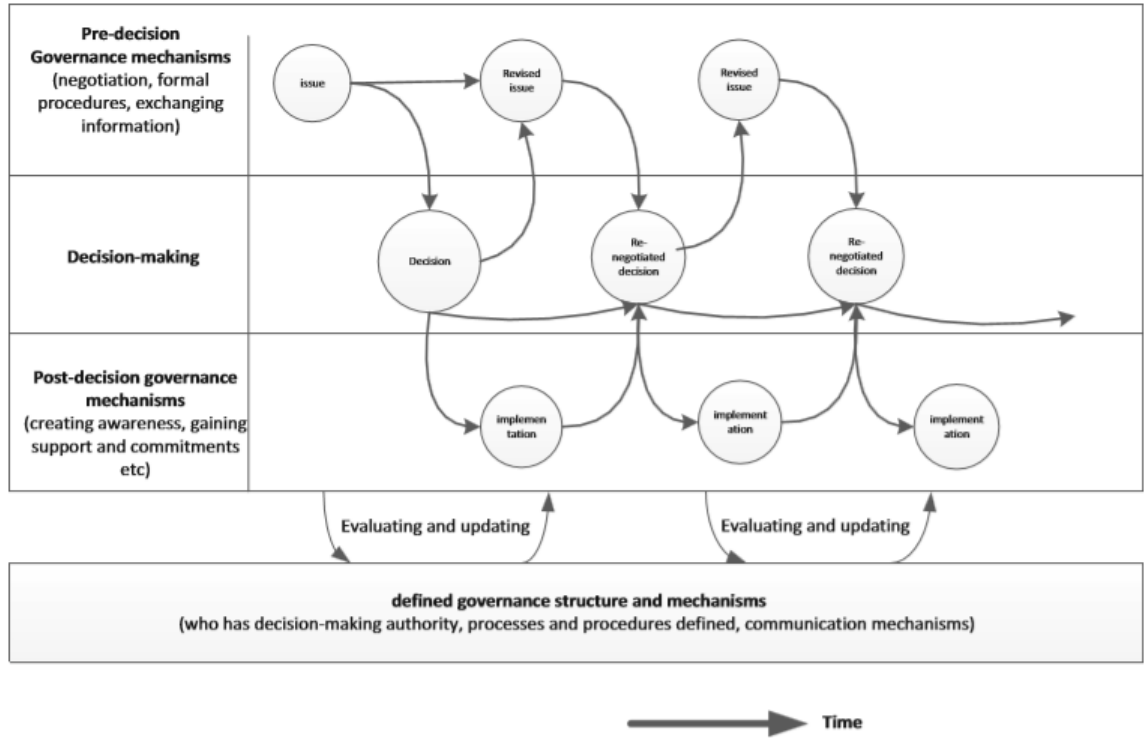
FIGURE 2.1: Network governance conceptualised as a continuous process [19], p12

Figure 2.1 shows a conceptualisation of governance as a process evolving over time. The existence of some initial issues results in the use of predefined or informal governance mechanisms. Ultimately a decision is made to deal with the contemporary issues at stake. The decision might be final and communicated and implemented using other governance mechanisms, or the decision might be challenged and results in a revised issue and the process started over again. As such there is a continuous loop between issues, the use of various kinds of governance mechanisms, informal processes and decisions, implementation, and the adoption of governance mechanisms. Furthermore, decisions and the underlying decision-making process are evaluated for facilitating organisational learning.

The bottom of Figure 2.1 shows that there is a defined governance structure and accompanying mechanisms that can be updated due to the shifting needs for

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governance. There might be defined governance mechanisms like monthly meetings between the organisational partners, procedures for dealing with changes and the communication of changes (like interfaces between systems) and so on [15]. Formal mechanisms might depend on variables like the maturity of the network, its purpose, the software systems used, the existence and form of leadership and other variables. Furthermore, in the process of implementation, the network may become aware that its governance mechanisms are insufficient for some issues making changes necessary.

2.2.3   Challenges to the present day ICT governance

Technology commoditisation and consumerisation are challenging old notions of governance, consumerisation, and alternative technology delivery models [5], along with other emerging technologies about to hit their problem solving stride. This challenge is not just about the nuances of centralised/ decentralised/federated but some very different governance structures that recognise the importance of outside participants. The new cloud-based-technology-delivery models and proliferation of consumerised devices have completely changed the governance equation. Cloud computing, renting rather than buying technology, and easily supported devices (such as smartphones and tablets) make it easy for anyone to acquire, deploy, and support digital technology. Business units no longer ask corporate IT if they can rent software or buy iPads; they just rent and buy as they choose, often without telling IT what they have done. So-called "shadow IT" is more pervasive than ever. The very notion that operational technology is fully commoditised challenges governance in several important ways. For example, many companies outsource their operational technology to local and/or offshore providers. Sharing outsourcing governance of even operational technology can make sense, particularly since businesses globalise. Supply-chain partners represent an ongoing challenge to governance, as they often present their integration and interoperability challenges that must be satisfied by the business units with which they conduct business [14].

Renting (versus buying and installing) software [5] calls for whole new governance models. Vendor management has emerged as a core competency for many companies. Service-level agreements must be managed for performance; business units and central IT alike have roles to play here. Similarly, renting hardware through cloud delivery will emerge within the decade as a viable alternative to building and maintaining huge server farms. This trend will challenge governance as well, requiring cooperation between business and technology units, since "control" will now involve

third parties—the cloud and supply-chain providers—committed to providing support to the whole company, not just its central IT organisation. Consumerisation has changed the way technology is introduced. Technology adoption now often occurs before employees enter the building. Web 2.0 and social-media technologies (such as wikis, blogs, podcasts, RSS filters, virtual worlds, crowd-sourcing, mash-ups, and social networks) are quickly making their way into companies. Corporate IT departments struggle to keep up with the use of these tools by employees, customers, and suppliers.

Web-based applications also pose a challenge [5] to old governance models. They are built quickly and deployed almost instantly. Changes to existing transaction-oriented Web sites are immediate. If a business unit wants to roll out a revised global pricing schedule, does it need to go through corporate IT?

In his contributed article, Andriole [5](pp 53) says:

> *"We crossed that authority chasm a decade ago when we invested in user-controlled rules engines and other technologies intended to support real-time decision making."*

Corporate IT no longer governs application development and all varieties of Web based applications, except, as suggested earlier, at the architectural level. Participatory development is a change from the past, but the prominence of the Web as the emerging dominant transaction platform has changed everything.

Globalisation is another major driver [5] of new governance models. As more and more companies expand their global reach, they must adjust the authority they exercise over the business units they encourage to grow. Decentralisation and federation are necessary to enable agile decision making; business units expanding around the globe need the authority to make local and regional decisions. Extending corporate IT from headquarters around the world makes sense infrequently. Servicing an army of technology ex-pats is expensive and inhibiting. Local talent, providers, and local/regional/country support make sense as companies build sustainable footprints around the world. Globalisation calls for new governance structures. "Headquarters" must decentralise.

Research data suggests [5] that enterprise CIOs and CTOs should focus on infrastructure optimisation, alternative technology delivery models, and architecture—and not much else. Business units should focus on requirements, application

development (within architectural standards), and deployment of fast/cheap technologies like those in social media. If companies do not adjust their governance around these activities, the business-technology partnership will collapse.

2.3 Business Model Analysis

In the context of Business Models, as per [28], there has not been any systematic and rational perception coming up, and the reason could be attributed to 3 aspects: Firstly, several researchers have proposed their concepts simultaneously. Secondly, social sciences like psychology, economics, management and ICT have all contributed to the development of Business Model theories and concepts. Lastly, though the BM applications are much broader in scope, the concept has been narrowed down to e-BMs after having it studied intensively in the light of modern day or New Economy [29–31]

Chesbrough [32] states that "each BM has two purposes: to create value and to capture it." Most researchers share this view, among others, [33–36] The value creation includes all the activities of an organisation geared towards meeting the needs of its customers. On the other hand value capture only refers to those activities that help them receive a return from the customers. A monetary payment [28] is the return. It could also simply be the brand loyalty of a customer group for a multi sided platform or can also be advertising. BM is very concisely defined as the blueprint for operating a business. Business Model can be displayed as two components: value creation and value capture – see Figure 2.2
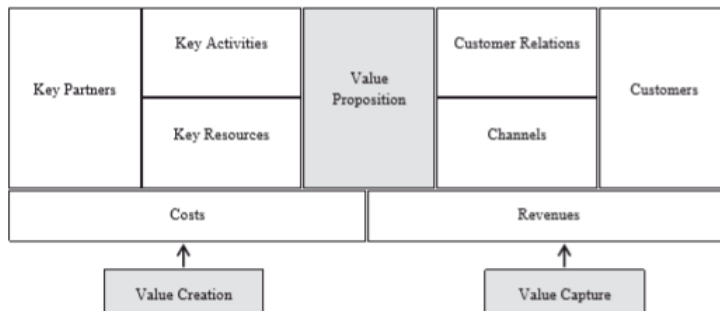
FIGURE 2.2: (Business Model Canvas divided into value creation and value capture) Source: Buliga [28], pp. 8

A Business Model can be summed up [37] from the answers to several questions: who, what, where, when, why, how and how much a company uses in order to offer

it's products or services. These seven components as shown in Figure 2.3 constitute the building blocks that make the value creation. The company's performance is enhanced which leads to a new offering if there are effective changes in at least four of these elements.
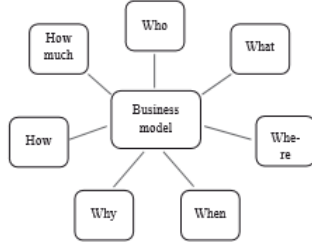
FIGURE 2.3: (Business Model Components) Source: Buliga [28], pp. 10

As per [35], the BM is defined as the sum of those elements that "allow a company to deliver value to its customers while delivering value for itself". Thus it is again linked to value creation and capture. A framework for BM analysis is thus proposed by [36] in his Four Box model. As the Figure 2.4 indicates, these four boxes represent the value proposition for customer, key resources, key processes and the profit formula. Through products or services or a combination of both, a company fulfils its customers' needs which are represented by the value proposition box. The profit formula bases itself on the value proposition and analyses the payment mechanisms. Through the payment mechanisms only, the value is captured by the company [35]. There are further four components of the profit formula: revenue model, cost structure, margin model and resource velocity. The first two of these also appear in the Business Model Canvas [33]. The margin model is a useful tool which clarifies that a low margin BM may still be profitable. Resource velocity indicates how innovative the company is and is analysed for a given time and investment for which the company delivers the value proposition.

2.4 Definition of Research Keywords

2.4.1 Responsive Supply Chain defined

Providing different services for different customer segments is not a very feasible model. The reason being the high cost of providing such services in a market where
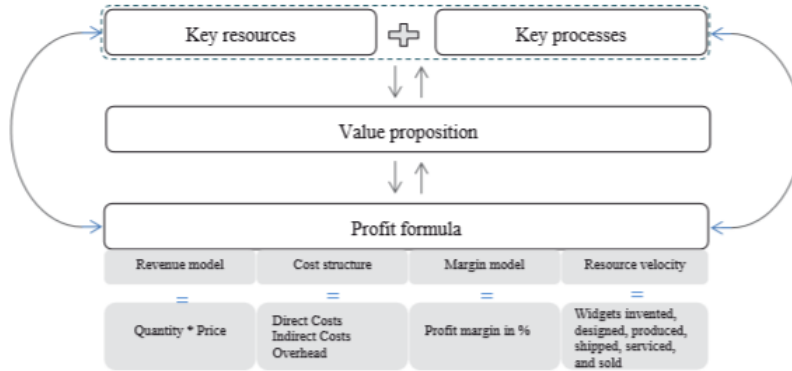
Figure 2.4: (Business Model as a four box model) Source: Buliga
[28], pp. 11

frequent changes in customer needs are a common place. In such cases, a responsive business model may provide a solution. Responsiveness is to "react quickly and positively". In business, the supply or value chain is analogous to a collaborative network. Steps to reduce information lead times and costs must be taken in a value chain (which is analogous to a CN) resulting in the concept of the "information enriched" competitive and responsive supply chain [38]. The five necessary basic functional activities in a value stream include:

1. Procurement (maximum purchasing discounts).

2. Inbound logistics (low transportation costs).

3. Operations (low production costs).

4. Marketing and sales (wide product range/high availability).

5. Outbound logistics (low transportation costs).

A responsive network can be defined as a network of organisations that is capable of generating revenue for its stakeholders in a competitive environment. The CN achieves this objective by reacting quickly and cost effectively to changing market requirements. There is a need to meet the changing market requirements by developing a suitable network of collaborators based on the core-skills and on leveraging people and information as quickly as possible and in the most cost-effective manner [39].

2.4.2 Agile Business Model defined

Agility is the capability of organisations that accepts all structures, information systems, business processes, and, in particular, mindsets[40]. The key characteristic of an agile model is flexibility [40].

An agile business model can act as the mechanism to defend against volatile and unpredictable demand in market conditions [40].

The agile concept which was earlier being used for software creation has moved to acquire a position in businesses. An agile business model will allow a network of collaborators to adjust the characteristics of the service or product quickly, and these changes can be easily integrated into the different information systems of the collaborating partners.

The agility may be enhanced by the development of a human resource strategy that encourages multi skills and leads to cross functional working of personnel[40]. A management based on the team has been shown to be highly effective in facilitating organisational agility [41].

2.4.3 Vertical Integration of networks and Unbundling of networks

As per [42], vertical integration is an arrangement in which the supply chain of a company is owned by that company. Usually, each member of the supply chain produces a different product or (market-specific) service, and the products combine to satisfy a common need.

As per [43], an organisation consists of three kinds of businesses; a customer relationship business, a product innovation business, and an infrastructure business. These three kinds of functionalities which are intertwined organisationally, constitute a vertically integrated organisation. Each of them plays a unique role with different people possessing different skills. They have different competitive and economic imperatives.

The history of computer industry illustrates the crucial role that interaction costs play in shaping industries and companies. Interaction costs represent the money and time that are expended whenever people and companies exchange goods, services, or

ideas. The exchanges can occur within organisations, between organisation and its customers and among organisations. The interaction costs can take common forms like regular meetings, conferences, phone calls, reports, memos and sales meetings [43]. Fig. 2.5 shows the three businesses within single organisation in a vertically integrated organisation

Under the pressures of deregulation, global competition, and advancing technology, a number of industries have already broken down along the fault lines of customer relationship management, product innovation, and infrastructure management. This has paved the way for unbundling of organisations.

Unbundling, in the context of this research, indicates that a product or service is delivered through the collaboration of several partners. Each partner has a specific role, and it coordinates with the other members of the network to complete the task at hand. The role of each member is spelt out in the business model of the collaborative network. The task is "unbundled" because it is carried out by different organisations.

2.5   Business Agility/Responsiveness

Business agility deals with supply chain's customer value [44], that associates with the downstream in the supply chain and is crucial if the demand fluctuates. An agile configuration can deal with unforeseen risks and risks that may originate from the customer side. Agile businesses respond quickly, are resourceful and have the ability to adapt to their environment [45].

Quickness is about the speed with which the business can respond to customer requests, market dynamics, and emerging technology options. The quickness also refers to the time to sense relevant events, the time to interpret what is happening and assess the consequences for the organisation, the time to explore options and decide on which actions to take, and the time to implement appropriate responses [46]. Resources are about the capabilities that are available within the organisation including people, technology, processes, and knowledge. Resources can be both tangible and intangible, and they provide the basis for doing business and for instantiating change [46]. Adaptability is about how well the business responds to the changing demands, threats, or opportunities. This effectiveness in the response

Rethinking the Traditional Organization

Customer Relationship Management
Identify, attract, and build relationships with customers

Product Innovation
Conceive of attractive new products and services and commercialize them

Infrastructure Management
Build and manage facilities for high-volume, repetitive operational tasks

As interaction costs fall, companies will come under pressure to unbundle their core processes, each of which has very different economic, cultural, and competitive imperatives.

Product Innovation	Customer Relationship Management	Infrastructure Management
Economics		
Early market entry allows for a premium price and large market share; speed is key	High cost of customer acquisition makes it imperative to gain large shares of wallet; economies of scope are key	High fixed costs make large volumes essential to achieving low unit costs; economies of scale are key
Culture		
Employee centered; coddling the creative "stars"	Highly service oriented; "customer comes first"	Cost focused; stress on standardization, predictability, efficiency
Competition		
Battle for talent; low barriers to entry; many small players thrive	Battle for scope; rapid consolidation; a few big players dominate	Battle for scale; rapid consolidation; a few big players dominate

FIGURE 2.5: Traditional Organisation Rethinking [43]

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requires the ability to learn and introduce flexible processes and products that can be reconfigured without extensive additional costs. [46, 47]

Businesses in the twenty-first century have to overcome the challenges of satisfying the demand of customers for products of high quality, but low price. To this end, the firms need to be responsive to customers' unique and rapidly changing needs [39]. The relentless pursuit of industrial efficiency no longer yields the profits it once did because it requires a level of business predictability that no longer exists. Instead, the Internet and global video and telecommunications systems provide a massive and continuous flow of data that causes the whole world to behave like a large stock market, with all the volatility and uncertainty that goes along with such markets. Responsiveness now trumps efficiency. By being responsive to the evolving needs and desires of specific groups of customers, companies can wrap their products and services in a simple blanket of value-added services to consistently earn an additional four percent or even larger gross margin than they would otherwise earn for the product or service alone. This customer and market specialisation are the most promising and the most sustainable source of profits in our fluid, real-time economy [48].

Chapter 3

Research Objectives, Methodology and Design

3.1   Research Objectives and Research Questions

An agile business model is one which adjusts itself rapidly to any changes in the market. Business agility can be defined as the ability of a business system to rapidly respond to change by adapting its initial stable configuration. Business agility can be maintained by maintaining and adapting goods and services to meet customer demands, adjusting to the changes in a business environment and taking advantage of human resources [44]. In a business context, agility is the ability of an organisation to adapt rapidly to market and environmental changes in productive and cost-effective ways [49].

The objective of this research project is to contribute to the body of knowledge around collaborative network business models [1], with the aim to:

- Identify different factors that are responsible for any organisational business model to be governed with an optimum level of responsiveness.

- To enable organisation to identify a suitable structure (degree of integration/unbundling) in a collaborative network business model, for their mode of governance, in order to achieve agility.

This research will address two main research questions. The first main research question is as follows:

Q1. How to govern collaborative networks to achieve an optimal level of responsiveness for a given business model?

The sub-questions for Q1 are as follows:

1. How do you define responsiveness for a network of collaborators?

2. Is there a way (that you know of) to have a measure of the responsiveness as mentioned above?

3. What are the models of technology governance/governance structures being used by your organisation within this network of collaborators for running this project?

4. What are the challenges to the current governance model used with your network of collaborators for this project?

5. What are the considerations that went into the formation of a business model for this project within the collaborative network?

6. How does the collaborative network implement (deployment and delivery of the product or service) technology governance for this project?

The second main research question is as follows:

Q2. How does the level of vertical integration (versus unbundling) in organisations affect the agility of their business models?

The sub-questions for Q2 are as follows:

1. How do you define vertical integration within the network of collaborators you are working in?

2. What is your view of an agile business model?

3. How will you measure it or in other words what could be done to measure agility?

4. What is unbundling of collaborative networks in your opinion?

5. How do you compare it with vertical integration (advantages/disadvantages)?

6. How do you think an agile business model for a collaborative network of organisations creates a defence against unpredictable market conditions?

7. How in your view could a vertical integration affect the agility of the business model for the collaborative networks?

3.2   Research Design (Methodology)

IT governance in a collaborative network context is a new phenomenon that lacks conceptual and theoretical specificity. In such a case, this research is exploratory in nature and given the research questions; a qualitative research approach was adopted [50]

As pointed out by Strauss and Corbin [51], a qualitative approach enables the researcher(s) to gain a better understanding of an under-researched phenomenon. More importantly, it has the capability to explore the views of the participants in ways a quantitative approach cannot. Among the qualitative data collection methods, a case study research method is the best approach for an exploratory study [51].

To address the sub-questions mentioned above, a primarily deductive method of qualitative data analysis was used. In a primarily deductive research, approach moves from the general to the particular. It involves carrying out a thorough study of the literature first to acquire some knowledge of the field of study. It then involves setting the research questions based on the literature [10].

Four organisations in a network of collaborators) that use an ICT enabled service/product were identified as cases for a multiple case study for this research. The main criteria adopted was different areas or sectors of industry for the selection of these four cases. A lot of potential participants were approached based on these criteria through emails and over the phone.

However quite a few of them declined the offer to participate in the interview mainly because of lack of time, and a couple of them expressed a lack of skills or knowledge to respond to the questions.

Since the research aims to address two distinct research questions, therefore it has been determined that the following will be the two embedded unit of analysis (UOA) within the multiple cases for this investigation [50] (Embedded unit of analysis).

1. Governance (of collaborative networks).

2. Integration vs. unbundling (in collaborative networks).

After that, data collection was done through interviewing and collection of documents for each organisation. Once the data was collected, analysis of the data was done with cross-case analysis for this multiple case study which is presented in Chapter 5. After the data analysis, an evaluation of each case was made based on the data analysed. Through the research findings, a set of guidelines were implicitly indicated for the CN cases so that the partner organisations may get some benchmarks for success in the governance of ICT projects.

In this research project, the following set of tasks were undertaken on the proposed set of recommendations and guidelines:

1. Requirement Analysis: In this phase, all the requirements were listed for an overall requirement analysis. The keywords in the title, e.g. keywords like ICT (information and communications technology), agility, responsiveness, unbundling, vertical integration and business model helped in the finding of requirements for the research project. This requirement formed the scope of the project. Any case that uses ICT as means would only qualify as this was one of the essential criteria for a case to be used. Other keywords like collaborative network narrowed the scope to only include a network of collaborators (not a single entity) for the cases. Since this research, although a cut down version, was based on an earlier proposal by the department, a broad requirement could also be found from the proposal.

2. Research Design: The most important part of the research design was to determine the units of analysis (UOA) first and then to conclude that a qualitative research that incorporates multiple cases will fit the requirements for the project. The decision to arrive at the number of cases was based on past experiences of senior academicians keeping in mind the time and other resource constraints. This design phase included literature reviews of those existing and relevant to the field and helped in the determination of the source of primary data being semi structured interviews.

3. Data Collection: As the interview was decided to be the main source of data collection in the design phase; necessary steps were taken to source the data. Once the necessary ethics approval was received, quite a few ideally different type of industries were short-listed for approaching their management for

participating in the interview process. The decision to invite a person for participation was taken in accordance with the Ethics approval. Participant Information Sheet and a Consent Form were emailed to give them an overview of the project and also the consent process. It helped a few participants to have the interview questionnaire mailed ahead of actual interview time for them to have some time to prepare the responses. Standard digital recording device available with the researcher was used to record the interview along with a back up device (smart-phone) that were kept running throughout the duration. A watchful eye was kept on the devices to ensure continuous recording of the interview proceedings. Later on, transcripts of these interviews were made in MS Word for use in the analysis stage.

In all, primary data were collected from five cases in different sectors with one participant each from three cases. The rest of the two sectors in (TAP and BD service) had two participants each. Four best cases were selected based on the relevance of the responses to the study. The following is the list of interviews conducted:

(a) Face to face: 4

(b) E-mail: 1

(c) Skype: 1

Data was collected from the following industries

- Transport.

- Insurance.

- Airlines.

- Telecommunications.

4. Data Analysis: Overall both manual and automated processes were used for data analysis. In this phase, the primary information in the form of interviewee responses from the transcripts was collated using manual method initially with two pass analysis. In the first pass, all the responses (along with questions) were put forth for each of the participant organisations in a matrix. In the second pass, coding of the replies was done using qualitative research coding practices [10]. The procedures adopted for pass one and pass two analysis are described in more detail in the Chapter 5, Section 5.1 on cross-case

analysis. A set of common codes were then drawn across the cases based on the pass two analysis (See Appendix 4 for a description of the codes). These codes qualify the salient and highlighted fragments of responses which help in building narratives for addressing the research questions. A small group of themes were also determined, each of which includes the relevant codes. These themes will later assist in the cross-case analysis of the case.

In this stage, the NVivo application (version 11) was also employed for organising the raw interview data from the transcripts in a project environment. The software helped in the coding process by automating the generation of documents related to each of the categories as discussed in Section 5.1.

5. Evaluation of Findings: The cross-case analysis of the sub-questions of the main research questions (RQ1 and RQ2) were summarised for quick viewing and also to aid in the findings of the research questions. Based on the summarised responses to the sub-questions, an explanation was build that fits into the data collected. The findings arrived at this way; also helps to note the inconclusive points for which additional research should be carried out.

6. Formulation of guidelines and set of recommendations: Through the answers to the research questions and findings of the thematic analysis, in a way, the guidelines were provided. At the moment they are all directly linked. However, some clarifications on those objectives of the project were provided through those answers.

In conclusion, a carefully planned research methodology that encompasses the research questions and the research design, critical for its success, was adopted. This section highlighted the six factors that this research addresses, in some detail. The research sub-questions were designed to answer or converge into the findings of the main research questions so as not to deviate substantially from the main objective at any time.

Chapter 4

Case Studies

4.1 Introduction

The area of technology governance within a network of collaborators is still in evolution due to complex technology ecosystem and market related factors. The new cloud-based, technology delivery models and proliferation of "consumerised" devices have completely changed the earlier governance equation [5].

Governance in a collaborative network using ICT as means lacks conceptual and theoretical specificity [22, 26, 52] as it is a relatively new phenomenon. The research in such cases is exploratory in nature for which a qualitative research based upon case study is most appropriate [50]. Because of the limited scope and time, constraints of this research, only the key aspects relevant to this research were further investigated and analysed. The findings are reported in Chapter 5 for a cross-case analysis of themes and in Chapter 6 for a cross-case analysis of sub-questions towards answering research questions 1 and 2. The summarised findings to RQ1 and RQ2 are discussed in Chapter 7.

4.2 TXT A PARK

4.2.1 Introduction

A local governing body has started TXT-A-PARK (hitherto known as TAP) scheme in 2004 with the second largest telecommunications service provider and later the largest telecommunications service provider became part of the scheme [1]. This service refers to the mobile text (SMS) based mode of payment for parking cars in

the local governing body owned parking. The payment and a 50-cent service fee are deducted from the prepaid balance or charged to the user's mobile phone account [53]. It has become quite a success because it does not require pre-registration [1]. It is a convenient way to pay for parking as it dispenses with the need to keep small changes at hand by the customer.

The TAP service was conceived as the local governing body's solution towards the problem of finding a cashless and secure car parking. Secure, as it does not require the main stakeholder organisation to manage cash stored at the parking machine. The storing of money, as suggested by the primary data from a previous study by this research student [7], has given rise to the acts of vandalism including stealing of cash from the sites. This case study provided the motivation to investigate the way collaborators in a value chain act together for achieving a successful business model using ICT. It is believed that the present research that involves TAP case study may add to the existing body of knowledge towards understanding the intricate relationship of responsiveness and agility with other characteristics in a CN, that uses ICT. It also aims to provide an insight into the critical success factors that influence long term engagement among the members of the value chain. The case study into this service is relevant since it has stood the test of time for over a decade.

An interview, which is the primary source of information for this study, was carried out on a senior level executive of the TAP-A organisation as part of the data collection activity for this case study. The data collected from this interview explained that there has always been a greater need for parking in the Auckland city. It becomes clear from the primary source of data that from the accountability, the audit-ability and the traceability points of view, there are many features to this project. These are discussed in detail in the later chapters (Chapter 5 and Chapter 6) on the cross-case analysis of the data.

Existing literature that perform a case study or analyse this project from some other aspects are [1, 53, 54]. Sharma [1] on which this study is based on, refers to the TAP service as a case study in a cross case analysis of some m-commerce applications using mobile payment; to formulate some key performance indication factors. Petrova [54] provides some insight of the service from a customer centric demand supply model and Viehland [53] analyses TAP from the context of usefulness and ease of use by the consumer for mobile payment services.

The TAP system works as follows: The customer presses Txt A Park at the vending machine and sends an SMS on his mobile with the parking machine number

with a short code corresponding to the time in hours he needs to park to a designated number printed on the machine. The inquiry for tickets is sent to TAP-A, who also request and receive information on customer funds from the carrier/s. Based on the availability of funds, they approve/disapprove as response and accordingly the parking ticket is either printed on the parking machines or reason for non-delivery is displayed on it. There is a surcharge of 50 cents on top of the actual parking fee, and this surcharge is evenly distributed between the carrier TAP-B or TAP-C (carrier involved) and the other collaborators, i.e. TAP-A and the parking machine vendor, TAP-E. The diagrammatic representation of the working of the scheme is depicted in Figure 1.1.

4.2.2 Mobile Payment Solution Provider (TAP-A): Organisational Overview of Participant Organisation

TAP-A is the Mobile Payment Solution Provider (MPSP) for the TAP service; It provides the payment solution platform that offers an interface to the customers to interact. It then performs the processing of user requests with the response of a printed ticket or a user friendly error message. In the background, it communicates with the MNO's to reconcile the requests with the availability of funds associated with the mobile user account before producing the response.

TAP-A is a leading provider of intelligent and secure business mobile messaging software solutions for enterprises and governments worldwide. Their explosive global growth in recent years is a direct result of their continued focus on global enterprise customer needs. They are head-quartered in Australia with regional offices in Europe, North America, South America, New Zealand and South-east Asia. The TAP-A solutions are uniquely engineered to enable mobile network operators (MNOs) and re-sellers to support their local enterprise and government customer opportunities.

This organisation's products are used actively by global top-100 companies, leading financial institutions, and large government agencies in four major world regions. The engineering and innovative solutions of TAP-A are highly acclaimed and have resulted in a powerful cloud-based enterprise platform. The platform integrates IP, SMS, MMS, voice, and location into a seamless, secure business mobile messaging experience. This organisation took over from the earlier payment solution provider

in April 2014 as being the new organisation looking after the solution with all the other collaborators remaining the same.

It was concluded from the analysis of the collected information, that there are a few other key collaborators in this value chain, namely:

- TAP-B, TAP-C (Mobile Network Operators).

- TAP-D (Mobile Business Service Provider - Local Governing Body).

- TAP-E (Parking hardware vendor).

As the discussions above show, the inquiry into the stakeholders and collaborators is an ongoing and emerging area and is only valid at the time that the study is being conducted.

4.2.3 Other Collaborative Network Partners

TAP-B, TAP-C: They are the two of the leading MNO's in New Zealand. The later was the first to join the service in 2004 with the former joining in 2006. Their involvement is the use of their billing and network system. The TAP-C was established in late 1980s. TAP-C's capabilities extended to the IT service sector, it operates its national voice and data network and provides a full range of internet, data, voice, mobile and fixed line calling services to its customers. TAP-B is a telecommunications company operating in New Zealand. It is the subsidiary of a UK listed company.

TAP-D: It is the local governing body that owns the service. TAP-D is responsible for all of the region's transport services (excluding state highways), from roads and footpaths to cycling, parking and public transport. It's day-to-day activities keep the cities transport systems moving; including planning and funding of public transport, promoting alternative ways to get around and operating the local road network.

TAP-E: TAP-E is the parking machine vendor who has designed, built, and integrated world-leading parking technology since 1993 and leads the market in the Australasian region with more than 6000 Metro terminals installed since 2007. In 2003, they developed TAP, the world's first truly integrated mobile phone parking payment application.

4.3 Health and travel insurance

4.3.1 Introduction

Health and travel insurance organisation HI-A is another example of an ICT service and works in a collaborative network configuration. A provider of these insurance products can not operate in isolation all by themselves and need several other collaborative partners to deliver their product and maintain it. They need to work with banks and a payment gateway provider to offer their products on line and have the functionality of paying through credit cards. They also need an organisation which specialises in scanning solution to convert the printed application and claims forms to the electronic version. For all their functionalities they need ICT as a tool and so do all of their partners. They need to use PC's to work on their software and web applications; web servers to host them; networking of their in house computing machines with all the associated networking hardware and also the need to fulfil the cloud hosting requirements, if they use cloud environment for deployment. The complexities and the challenges of the projects to deploy and deliver those products, make them a suitable context for the study of interrelationships among the collaborative partners. This interaction is through effective communication across the stakeholders. Therefore, the importance of a working relationship with the key account management between the HI-A organisation and its partners is paramount. Through effective strategies and policy making in project governance and an efficient project management to implement governance strategies, the organisation objective is achieved.

A senior technology executive of the HI-A organisation was interviewed as a primary source of information for this research. The experience of working in a collaborative network with other partners in the health insurance sector, as shared by the participant, provided a valuable resource for this case study.

The health and other insurance products have been influenced by the proliferation of mobile devices that are ubiquitous and localised in nature. Presently, the trend is to have a portable version of all the organisation websites to get the leverage from this ubiquity and localisation. It has, therefore, become commonplace to expect business from the consumers, even when they are on the move, the HI industry being no exception.

4.3.2 Health Insurance Product Provider (HI-A): Organisational Overview of Participant Organisation

The major stakeholder, HI-A, is a well known organisation in the health and travel insurance sector in the Australia New Zealand region. As one of the largest health insurers in New Zealand, they provide a range of health insurance options for Kiwis and their families, as well as for New Zealand companies who want health insurance for their employees.

HI-A provides value for money and affordable health cover to more than one million people across the Tasman. With over 60 years' experience, today this organisation is a genuine Trans-Tasman business that offers innovative products and services, and greater value for their customers. The mission statement of the organisation states that it helps people with affordable healthcare with high class products and services when and where needed (Source: HI-A public website).

This organisation acquired a major New Zealand Medical Insurance organisation a few years back and at the end of 2013, the organisation was launched in New Zealand. Recently this company has acquired another major player in the health insurance sector in New Zealand (Source: HI-A public website).

The organisation is offering health insurance cover with no health related questions being asked. Customers can find the health cover that suits their needs and then join on line in just two more steps. The insurer has a 14-day free-look period, where the customers can take the time to review their cover to ensure that it meets their needs – if they decide the policy is not right for them, they can cancel it, and the insurer will refund any premiums paid, provided no claims have been made (Source: HI-A public website).

The organisation provides a range of private hospital care products, that mean no long waits in the public health system and avoid paying enormous amounts of money in private hospital costs (Source: HI-A public website).

Besides the private hospital products, the HI-A provides daily health cover, for health costs that do not need a hospital visit, like visiting the general practitioner, or no-referral physiotherapy (Source: HI-A public website).

The HI-A also sells travel insurance products and has acquired a travel insurance company recently.

4.3.3 Other Collaborative Network Partners

First of all, the collaborators in the network were identified, and they are listed below:

HI-B (this organisation are the main bankers to the health insurance stakeholder organisation) – HI-B is one of the major banks in New Zealand and is a subsidiary of an Australian Bank and financial services provider. As of the end of November, it had more than 13 million customers and Australia's largest branch network with close to 1500 branches and a network of nearly 4000 ATMs.

The Bank offers the following products: Finance and Insurance, Consumer Banking, Corporate Banking, Investment Banking, Mortgages and Credit Cards. The health insurer which is the major stakeholder for this case uses a tool trTool provided by HI-B to view all the transactions made on their account immediately, and they can post direct credits. The trTool provides a simple user interface which is similar to web based mail systems. It is web based and is used to send or receive files securely to and from XYZ systems which is a fully owned subsidiary of HI-B. XYZ systems provides web-based software and support services that enable the medium to large enterprises streamline financial business processes such as accounts payable, accounts receivable and superannuation (Source: Wikipedia). The trTool performs the following functions two main functions:

- Receiving Files.

- Sending Files.

HI-C (this organisation serves as the payment provider for the health insurance organisation) – HI-C is a high-growth, innovative global leader in payment technology, delivering a range of secure solutions to major corporate, banking and SME clients globally.

HI-C is certified with Visa, Master Card, American Express and so on, providing a global end to end payment platform that facilitates electronic payments seamlessly, with a full world-class range of products spanning e-commerce, cashless parking/vending, and retail terminals. The HI-A organisation uses the payment gateway of HI-C to receive the credit card payments on account of their receivables like premiums.

They are head office in Auckland, New Zealand with offices in Australia, UK and the USA.

HI-D (HI-D is a provider of all digital scanning solutions) - HI-D is essentially a scanning solution provider. They scan all the HI-A organisation's incoming mail, putting it into a suitable electronic format and sending it through to them. Essentially HI-A has a PO Box for receiving all their incoming mail. HI-D have keys to this PO Box. They pick up all the mail that gets delivered to the PO Box and take to their place, where they open them. If it is a claim form, they scan it and ensure that it goes to the right queue, electronically it comes to HI systems and end up with their claims team. Any application form for health insurance goes to HI new business team. So essentially they collect mail, open mail, categorise it, scan it and they store the mail for the HI-A organisation.

HI-E (HI-E who created the mobile app front end for the HI-A) - HI-E is an Australian based organisation and provide end to end mobile commerce solutions, from app design to after sales service.

4.4   SIM card sales and rebate processing service

4.4.1   Introduction

The primary stakeholder (the owner of this service) is the SIM-A organisation which will be introduced through the paragraphs below. For this case, a participant from the technology side of the SIM-B organisation, which is a major collaborator, providing all the infrastructure for this service, was interviewed to collect information. This information is the main source of data for the present case on SIM card service. The SIM-B organisation has a close association with the day to day operation of the SIM service owner organisation (SIM-A), which was once a part of the former.

The information gathered from the primary data suggests that this is a relatively new service having been introduced in the local market since Mid-2013. This service is an example of ICT enabled automated selling and rebate processing. In a nutshell, this service encompasses the sale and rebate processing of mobile phone SIM cards to customers, by an Auckland based organisation, SIM-A.

It is important to note that this service is in no way connected with the provisioning of services to the partner telecommunication organisations. The scope of the service is only limited to selling and rebate processing (post sales), on SIM card activation and top ups.

SIM-A are involved in the business of prepaid mobile phone accounts. They are also the stockists of prepaid mobile SIM cards from all the major telecommunications service providers in New Zealand. All the major telecommunications organisations in the local market, have entered into an agreement with SIM-A, to work in a collaborative network for availing of this service. By doing so, these organisations use the existing distribution and sales network of SIM-A for marketing their products. As a result, they can reduce their operational cost, which they would otherwise incur in the creation of in house distribution and sales infrastructure.

This project uses modern application development platforms and tools to automate the process of:

1. Placing a sales order on a software application known as SalesApp.

2. Display of the order in another application named WarehouseApp used by the major collaborator SIM-B warehouse for stocking the physical SIM.

3. Processing of the physical order (actual SIM cards) through WarehouseApp.

4. Activation and top up rebate calculation process automation achieved by running suitable SQL database jobs.

The above steps are geared towards the course of selling SIM cards to the retailers of the main stakeholder SIM-A. The rebate is a fixed discount amount that applies to the retailers, who are the direct customers of SIM-A. The project started with the SIM cards of two MNO's, SIM-C and SIM-E and has now integrated four more organisations, namely, SIM-B, SIM-D, SIM-F and SIM-G as partners in the form of SIM cards supplier.

4.4.2 Infrastructure and Platform Provider (SIM-B): Organisational Overview of Participant Organisation

The infrastructure provider organisation SIM-B is a leading communications service provider in the local market. It provides voice and data services and calling

card products. It is a purely New Zealand based organisation offering internet and telecommunications services. SIM-B also provides mobile phone services to consumers.

SIM-B offers some popular phone card brands. These are prepaid phone cards and deliver low cost calling throughout New Zealand. They are also used for calling overseas and are sold at thousands of stores nationwide, from local dairies to other large supermarkets.

A conclusion was drawn from the data analysis of the primary source of information that there are other key collaborators in this value chain (besides the SIM-B) as described in the next section.

4.4.3 Other Collaborative Network Partners

Besides SIM-A and SIM-B organisations (as detailed above), all the major telecommunications providers in the country are involved as collaborative partners in the service. They perform the role of SIM card suppliers. In other words, they have entered into suitable agreements with the major stakeholder SIM-A, for the supply of SIM cards, to be sold to the consumers through the sales network of the latter.

The following is a brief description of each of the partners engaged in this service:

SIM-C: They are a major communications service provider providing fixed line telephone services, a mobile network, an internet service provider, and a major ICT provider to NZ businesses. They are among the two largest players in the sector in New Zealand. SIM-C is one of the biggest companies by value on the New Zealand Exchange.

SIM-D: SIM-D is a telecommunications company operating in New Zealand. It is one of the largest MNO's in New Zealand. The company employs over 3,000 people and has operations nationwide, with its main offices based in Auckland, Wellington and Christchurch. SIM-D operates a GSM (2G) mobile phone network at 900 MHz and 1800 MHz, a UMTS (3G) network at 900 MHz and 2100 MHz, and a 4G LTE network on 1800 MHz. This organisation also provides services for mobile virtual network operators. Mobile virtual network means other companies can resell SIM-D's network services (data, telephone and SMS) under the latter's brand name.

SIM-E: SIM-E is an MVNO (mobile virtual network) operator owned by SIM-C. Unlike most other MVNOs in the country, it sells prepaid SIM cards and data at very low prices. It uses the network of SIM-C in 3G and 4G/LTE.

SIM-F: SIM-F is a telecommunications provider operating in New Zealand. The mobile network was launched in 2009 after long years of planning. SIM-F offers prepaid and pay monthly mobile services.

SIM-G: SIM-G was established in 1999 in American Samoa. It is a regional telecommunications group and its companies started operating in Samoa, American Samoa, Cook Island and New Zealand providing fixed line, mobile, broadband and TV services to customers. This organisation made its beginnings as a mobile phone company. All of their Plans are on the prepaid mobile account, which means customers will not get any billing surprises at the end of the month. They use a network that covers 97% of places where people in New Zealand live and work so they can always stay in touch.

4.4.4 Detailed insight into the SIM card service

Background: In this case, the SIM-B and SIM-G are the virtual SIM card suppliers, with the other organisations being the real SIM card suppliers. The real SIM card suppliers have their own infrastructure, which the two virtual SIM card suppliers do not have, and they share the infrastructure of SIM-C organisation.

Product Flow: Figure 4.1 shows the product (SIM cards) flow from the SIM card suppliers, in response to the SIM-A purchase order for an advanced stock of the SIM cards, that the latter wishes to sell to the retailers. On receipt of the order, the SIM card supplier organisation communicates all the product related relevant information which includes product serial, name, bar code, quantity and simultaneously dispatches the physical SIM cards to SIM-A. Once the relevant information associated with the product is received, it is sent to the development team of the SIM-B organisation, who loads it into the relevant database with all the order related logical data including SIM card serial numbers. The SIM cards within those serial numbers are available to SIM-A retailers for sale and information to that effect is sent to the warehouse team within the SIM-B organisation, who stock the physical SIM cards on behalf of the SIM-A organisation.
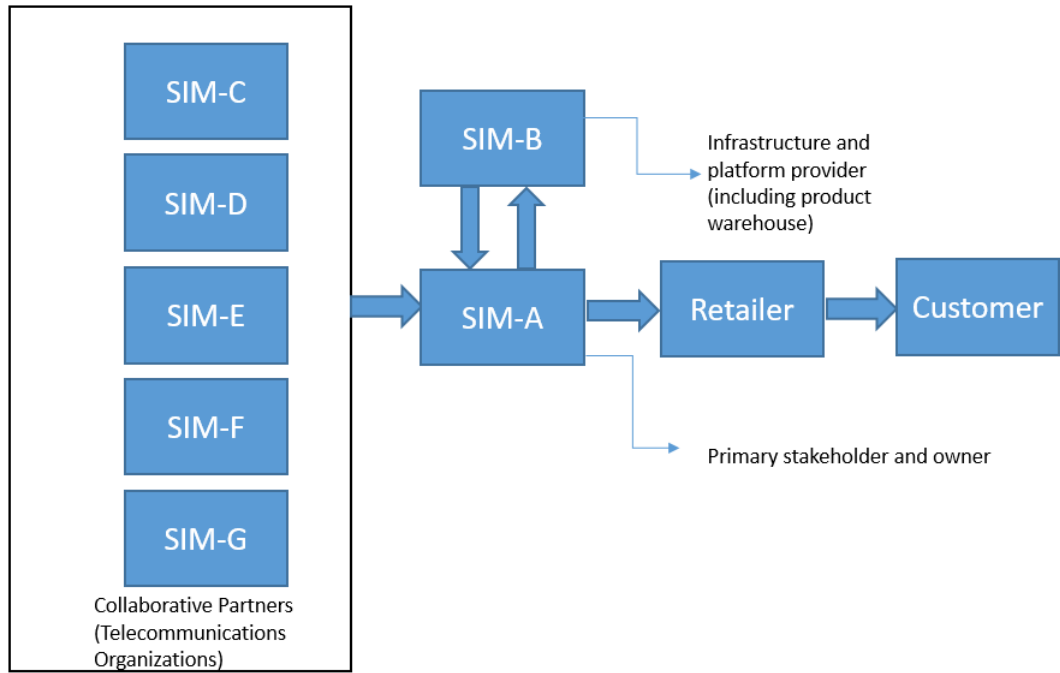
FIGURE 4.1: Product flow diagram for the SIM project

The sales representatives of SIM-A organisation explain the working of the rebate scheme to their retailers. When the retailer sells a SIM to a customer, through their EFTPOS channels, the transaction information from the retailers is reported back to SIM-A. So the latter knows which SIM serials were sold along with the respective bar codes. The retailers would place the order for SIM cards to SIM-A organisation on SalesApp. This order gets notified to the Warehouse team through another application, the WarehouseApp, which shares a common database with SalesApp. The warehouseApp displays all the order details to the warehouse personnel. So the required quantity of SIM cards matching the order details is withdrawn from the stock. Subsequently, these cards are scanned in succession, through a bar code scanner. After that, the system generates a packing slip with the order details. The SIM cards are packed in designated bags, labelled with the packing slips and dispatched to the concerned retailers. So that is the distribution network.

The Revenue Stream: The SIM-A organisation invoices the retailers weekly. The invoice includes the rentals of EFTPOS machines owned by SIM-A, that the retailers use for carrying out the transactions, along with the price of the SIM cards. The SIM-A organisation sends the physical products in advance to the retailers, but a direct debit account with the retailers would have already been in place. Therefore, they (SIM-A) are assured of their monetary returns. The rentals from EFTPOS are

a secondary revenue source. The SIM-A organisation pays the SIM cards supplier on a particular day of the month for those purchased SIM cards. The former have an agreement with the SIM card supplier that whenever the SIM card is topped up after activation, a monthly report of the same will be sent to SIM-A. Through this report, the latter would determine the retailers that qualify for a rebate and inform them about the receipt of rebate each time a SIM card is either activated/topped up or both. The SIM-B organisation has an automated process in place to find out which serial was sold to which retailer, who in turn receives the rebate the following week.

4.5   Self Service Kiosk and BagDrop Case

4.5.1   Introduction

BD-A is the major air carrier of New Zealand and is the main stakeholder for this service. They have recently speeded up the check-in process for customers with self-service kiosks. Although BD-A covers the complete New Zealand network, the majority of their traffic occurs between Auckland, Wellington and Christchurch. BD-A and a consortium of companies developed the BagDrop system to improve the passenger experience at these major ports. The solution has resulted in the elimination of passenger queues, reduced operational costs and better utilisation of the terminal space giving passengers an enhanced travel experience.

BD-A operated in a very competitive market and wanted a way to reduce operational costs, increase passenger satisfaction and differentiate themselves from their competition. Their check-in areas at the three major airports were generally cramped and noisy, with extensive queues at peak periods. They analysed the traditional passenger check-in process and determined that this process needed to be re-vamped to provide a much enhanced passenger travel experience as well as to utilise the available space better. It is in this area that the queues are the longest and passenger satisfaction is the lowest.

The project was to do five airport upgrades in 6 weeks. Thus, it was chosen as a case as it provided all parameters under investigation in this research such as agility, responsiveness and efficient project governance.

FIGURE 4.2: BagDrop at airport terminal

Interviews were carried on competent and senior level management personnel (from the technical side) from BD-A and BD-B (major CN partner for BD-A), to collect primary data for the research. The findings from the data analysis are presented in Chapter 5 and Chapter 6.

Domestic Check-in If the customers, the airline passengers, need to check in a bag (or if they need to print a boarding pass to scan at the gate) they can use the airline self-service kiosks at Auckland, Wellington and Christchurch. The kiosks are capable of printing passenger boarding passes and bag tags.

International Check-in Passengers can check in using self-service kiosks at Auckland, Wellington and Christchurch. The passengers need a machine-readable passport for performing the self check in. The kiosk is capable of printing their boarding passes and bag tags when they check in their luggage.

4.5.2 Design Overview

The following passage is extracted from the public website of the BD-B organisation, which provided the solution for this service. This organisation was a major partner of the main stakeholder organisation, BD-A for this service.

The baggage solution provided at the three domestic terminals required the baggage system to be modified to assist the BagDrop project in the following ways:

- An exposed collector conveyor was provided for passengers to place their baggage directly onto instead of the traditional check-in counters which were all removed.

- To automatically handle the passenger check-in process including the issue of boarding passes and bag tags, banks of 8 check-ins and tagging kiosks were installed.

- The next step was for customers to self tag then deliver bag(s) onto the collector.

- To read the baggage tags, an Automatic Tag Reader was installed.

- An in-line weigh scale unit was installed, to monitor baggage weight. An automatic labelling unit was mounted just after the weigh scale to label those bags that are overweight.

- To ensure that the system saw 100 % of the baggage and reconciled to the DCS, an area was created back-of-house for staff to scan and reconcile those bags that were not automatically handled by the system.

The following is a general description of the system process. 4.3

4.5.3 Airline organisation (BD-A): Organisational Overview of Participant Organisation

BD-A is one of the major Airlines of New Zealand. Based in Auckland, the airlines operates scheduled passenger flights to 22 domestic and 29 international destinations in 16 countries around the Pacific rim and the United Kingdom. The airlines served international routes until the late seventies when the government merged it and the domestic carrier Carrier B into a single airline under the present name. BD-A was
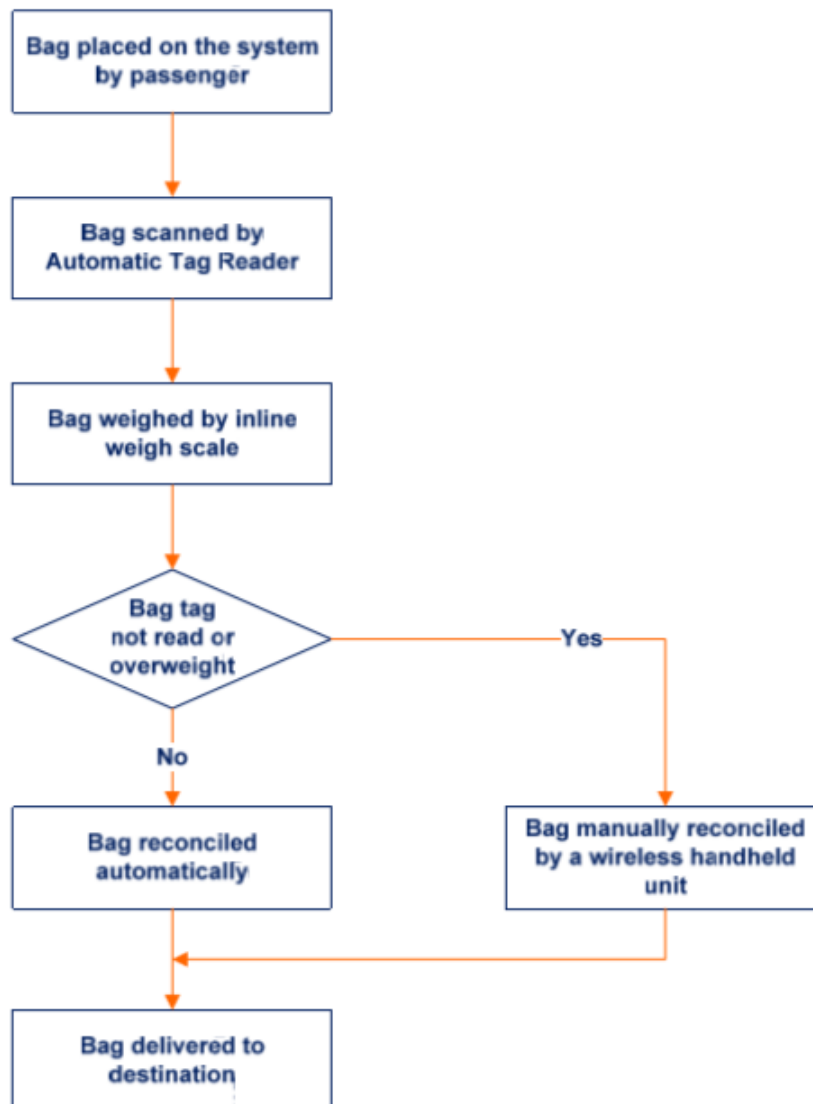
FIGURE 4.3: BagDrop System process diagram

privatised in the late eighties but returned to majority government ownership at the onset of the new millennium.

BD-A's route network focuses on Australasia and the South Pacific, with long-haul services to eastern Asia, the Americas and the United Kingdom. BD-A currently operates a long-haul international fleet consisting of the Boeing 777 family, Boeing 787-9 Dreamliner, and Boeing 767-300ER aircraft. Airbus A320 aircraft operate on routes to Australia and the Pacific Islands, and on domestic routes (Source: Company Website).

Here are some facts and figures on Airways Corporation (Source: Company leaflet):

Staff Worldwide : 2300

Customers Processed Each Year : 13.5 Million

Bags Handled Every Year : 12 Million

Airports around the world : 53

Number of lounges of the airline : 23

Staff assigned to clean a 777-300 : 18

within 45 minutes so it can depart

in time

4.5.4 Bag drop solution provider (BD-B): Organisational Overview of Participant Organisation

BD-B is a synergistic group of technology companies with headquarters in Auckland, New Zealand. Their focus is on providing innovative solutions to their clients in the global air transport and logistics industries that deliver long term value. BD-B was founded in 1993 and their expertise lies in hardware solutions, automation controls and smart in-house software solutions which have made them supplier of choice to airports, airlines, freight and industrial customers across Australasia and around the globe. Their Airport and Airline Solution includes design, fabrication, installation and commissioning of complex baggage handling sortation and security screening systems. Their core expertise can be summarised as

- Turnkey baggage handling systems.

- Baggage handling components (conveyors, check-ins and carousels).

- System design, simulation services and consulting.

- Automation control systems design and integration.

- IT software and high level control design development and deployment.

- Innovative financial outsourcing solutions for Baggage Handling Systems.

BD-B is the most important collaborative partner to BD-A for this case. The company provided the middle-ware software to allow information obtained from the baggage handling system to be communicated back to the Airline Departure Control System (DCS). They are the baggage integrator that the main stakeholder used. BD-A have other solutions which were utilised in the last eight years and provided by BD-B. They also have their baggage reconciliation system written by BD-B as well. BD-A have a very intimate knowledge of BD-B system having used it for eight years but also as a provider; they are a trusted partner doing much development for BD-A rather than them doing it in-house. So both the CN partners have done a lot of joint specifications and come up with several baggage solutions together.

4.5.5 Other Collaborative Network Partners

BD-C: BD-C is a third party project management company used by BD-A for this initiative. BD-C provides expert Project Management services to the following aspects of the Project Life Cycle:

(Source: Company Website)

Initiation:

- Project Governance.

- Project Funding.

- Project Feasibility.

- Procurement.

- Supply Chain Strategy.

- Option Analysis.

- Stakeholder Planning.

- Resource Planning.

Planning:

- Client and Consultant Briefs.

- Concept Analysis.

- Design Management.

- Risk Analysis and Mitigation Strategies.

- Communication Structures.

- Project Programming.

- Tendering.

Delivery

- Construction Management.

- Supply Chain Analysis.

- Contract Negotiation.

- Client Representation.

- Engineer to Contract.

- Dispute Resolution.

- Health & Safety.

- Contract Administration.

The new self-service check-in area for BD-A was designed to improve and enhance the customer's journey. The project is part of an overall plan to provide a clearer distinction between Economy, Premium and VIP customers.

The scope of work included:

- Installing 55 (partly new) self-service check-in kiosks.

- Careful alignment with the Airways Corporation brand.

- Family, special assistance and special handling zones.

- Twelve bag drop desks and associated machinery.

- Ten service desk workstations for staff and customer transactions.

These were the challenge faced by BD-C in this project

- The check-in area had to remain fully operational throughout construction so work was phased to minimise disruption to passengers. The work plan included keeping noise and dust to a minimum.

- The project involved comprehensive stakeholder management and health and safety requirements. It was carried out under stringent airport security constraints.

BD-D: BD-D is a major telecommunications service provider to the local New Zealand market. They were involved in the project for upgrading the Airport network system.

Chapter 5

Cross-Case Analysis of Themes

5.1 Introduction

The cross-case analysis method has been employed in the present research for analysing data across cases. This method uses cross case pattern searching using divergent techniques [55]. It forces investigators to look beyond initial investigations and see evidence through multiple lenses [55]. The tactics here are driven by the reality that people are notoriously poor processors of information. They leap to conclusions based on limited data [56], or by more elite respondents [57]. The data should be looked into in many different ways, to counteract these tendencies which will result in good cross case comparison.

The tactic employed for the cross-case comparison was to consider all the four cases in this multiple cases, case study and their points of similarities as well as differences were listed. The juxtaposition of seemingly similar cases by a researcher looking for differences can break simplistic frames. In the same way, the search for similarity in a seemingly different pair also can lead to more sophisticated understanding. The result of these forced comparisons can be new categories and concepts which the investigators did not anticipate [55].

Open coding methodology was adopted [10], to analyse the data. The raw interview data was used for doing the pass one analysis. This stage of analysis was done manually by creating a spreadsheet table with the cases forming the columns and responses to each interview question, forming individual rows. Afterwards, keywords and salient points (which could be part of a sentence or group of sentences) from each of the responses were highlighted for use in the next pass of analysis.

The pass two analysis was carried out after identifying a few categories based on the sub questions (which were the same as the interview questions) as well as the pass one analysis completed earlier. The categories that were identified are as follows:

1. Responsiveness.

2. Agility.

3. Business Model.

4. Overall Communications.

5. Types of bundling.

The pass two consisted of a table which had each of the cases forming an individual column (as in pass one analysis). Salient and highlighted parts of responses formed the rows to each category (as listed above) along with its contexts, as required. Before this, the interview questions and their responses were grouped together to be included under one of the above five categories.

The next step was case wise coding of all salient and highlighted points (resulting as a consequence of the pass two analysis) as per each of the above listed five categories. The procedure adopted was that individual MS Word documents were created corresponding to each of the categories namely: Responsiveness, Agility, Business Model, Overall Communications and Types of Bundling. Then some codes that could qualify those fragments of responses were formed. So it implies that the categories resulted into codes formed from marked blocks of text (group of words or sentences in a paragraph within the transcripts) satisfying common characteristics in line with the code definition (Refer: Appendix 4).

The comprehensive list of codes that were drawn up is as follows:

1. Ease of Use.

2. Efficiency.

3. Usability.

4. Flexibility.

5. Quality of Experience (QOE).

6. Availability.

7. Usage Measurement.

8. SLA (Excluding Availability).

9. Functionality.

10. Change Management.

11. Communication.

12. Operation Management.

13. Complexity.

14. Creativity.

15. Capability.

16. Feasibility.

17. Competitiveness.

18. Superiority.

19. Compliance.

20. Profitability.

21. Market Unpredictability.

22. Outsourcing.

23. Visibility and Control.

24. Intellectual Property.

25. Strategic Goals.

The above codes are defined in Appendix 4

Finally, the following themes emerged in which each of them encompassed several codes:

1. User Experience.

2. Core Offerings.

3. Critical Success Factors.

4. Degree of Unbundling.

5. Critical Constraints.

5.2 Cross-Case Thematic Analysis of Data

The following paragraphs describe the findings across cases for each of the themes mentioned above. Data quotes have been presented from the interviews where found appropriate to support the interpretation of data. However, for the sake of brevity of this thesis, the presentation of the quotes have been kept to the minimum. This is the reason that every case does not necessarily include quotes for each of the themes. The quotes are also intended to provide an insight into the actual responses to lend more authenticity to the data analysis.

User Experience

1. TAP: From the data collected in this case, a conclusion is drawn that the user should be able to use the interface in a manner in which computer literate people can use MS-Word or Excel. A great user experience has the simplicity of usage as the important basic factor in providing a positive user experience. If the user feels that it is a complex process to get a parking ticket, then it is going to have a push-back. The push-back may occur as complexity in usage has a cascading effect on top of the fact that the user finds it frustrating to pay for parking, since free parking is always preferred. The data suggests that the solution to park should be agile and responsive to the needs of the user. It should provide the end product which is the parking ticket as fast as possible. From the business perspective, there is no acceptability around delays in receiving information about the system operation or in other words, the system should be capable of being monitored to the minute. From the customer perspective the delivery of printed tickets should be almost instantaneous. Since the service has run for some years, the machinery and software have evolved over time which is to say that TAP has grown its footprints. It is therefore probably safe to assume that the user experience has also improved over time with its evolution. The user expects an easy way to pay for parking from this service, through the ease of use, supported by a simple process. With the process having been unchanged within the same system, it seems to have

proven effective as per the data. The effectiveness of the service is evidenced by the fact that it has been operating for more than ten years.

2. HI: The following is one of the quotes from the interview that refers to the user expectations from a website

> *"We don't want the whole system to crash. We want a nice, graceful, elegant message that would rather handle the join and tell the customer that they will receive and acknowledgement in the near future."*

The quote above was about the expectation of user experience in the event of a website malfunctioning. This situation could arise because of the non-availability of the link (broken) between the website host and back end which is hosted by the HI-A, the main stakeholder. A good user experience is helped by the presentation of a graceful and elegant message that informs the user of the problem with a promise of an acknowledgement soon.

> *"So whatever the solution, needs to be elegant and gives the customer a good understanding of if they need to do anything to continue with the function that they were looking at doing."*

A sound user experience, as the data collected suggests, comes from a solution that is elegant and that gives the customer a useful message or immediate steps needed to continue with the task that they were after.

The HI data collected suggests that in the event of a website malfunction, the user should not be presented with a crashed site which can result from a broken link between the website host and the back-end that is hosted on the main stakeholder server.

3. SIM: Not enough data available for drawing any conclusion about user experience.

4. BD: The bag drop case data suggests that a good user experience comes from saving precious time of the user. Thinking of a situation where a passenger going to a place where there is a simple transaction, has to stand in the queue behind a person going, say to Zanzibar where a complex transaction is involved prompting a nagging wait for the former. This case avoids the above situation as it does not require queuing up of passengers by allowing them to stand side by side with others and work on their kiosks simultaneously. Here we have

many to many relationships of service as compared to the previous queuing up which was many to one. Many to many means that many people could be served by many self-help kiosks simultaneously. The staff as a user first, have learnt the technology to train the airline passengers. Trained staff have given the passengers an advantage of learning from staff that provides a better user experience as it does make the process simpler to directly learn from trained personnel in contrast to self-learning through documentation.

Core Offerings

1. TAP: The data analysis has highlighted a few offerings from the TAP service. One of the critical offerings is the transmission and receipt of parking machines' transaction information updated in real time. The respondent suggests that any delay is not acceptable from the business as well as from the customer's perspective, as it is a part of IT systems and communications. The mobile payment solution platform of TAP-A organisation can be seen as another core offering. The respondent (Regional Sales Director NZ of this organisation) in this case emphasises the fact that they offer a platform that is robustly secure and process wise resilient. The following quote seems to defend the above assertion:

   > *"We have yearly tests on our platform as to does it comply with some level of industry? Is it resilient in terms of process, robust in terms of security, and does it apply to standards expected of a global carrier provider?"*

   Taken on its face value, it seems that the organisation tends to take security, compliance, quality standards and resilience of the systems quite seriously. This platform is developed in Java and offers APIs (Application Programming Interface) that are exposed to the industries that want to make use of them. The advantage of this system is that an organisation can, with a little bit of work, integrate their system into this platform. The result could be some transaction communication engine which will be capable of delivering messages in a process that is governed by the business of the interested organisation.

   In summary, the offering of the mobile payment solution provider is the provision of an easy method to collect revenue from the parking customer. The importance of having a solution that does not miss a single transaction cannot be over emphasised. So it is an important part of their business model to offer

a service that guarantees that revenue is not lost in transit. Another core offering by TAP-A that was revealed from the primary data is the cloud hosting service. In the analysis of the primary data, two important facts came out, that cloud hosting provides agility of plugging into the existing architecture as well as it provides compliance. At a relatively lower cost, the organisations can get a stable and flexible mechanism in terms of compliance and plug ability with the business requirements having the ability to be moved around mechanisms. The core offering of TAP-E (parking machine hardware vendor) is the invention and deployment of TAP service itself. (Source: Company website). This organisation also offers parking machines and hardware, all servicing and maintenance support.

2. HI: The collected data brings out the fact that the HI organisation works in an agile way by working on a listed few projects to offer health and travel insurance products. The secondary data of the HI-A organisation gives information on many health and travel insurance related products they offer. These have been covered in some details in Chapter 4 (section 4.2.2) on case studies.

3. SIM: The following are the core offerings as corroborated by the available data:

    - Sales and distribution network for SIM cards.

    - EFTPOS machines being used by the retailers (customers of SIM-A).

    - Automated rebate processing on top up and activation for the retailers that act as direct customers to SIM-A.

    - Communication and deployment channel between the various CN partners.

4. BD: Core offering is the self-help check in and bag drop system as opposed to their previous offering which was a queue up system. The primary data collected further suggests that organisation BD-A, which is the main stakeholder are responsible for network and communications required to get the bag drop project moving forward. Once the project is ready, they offer dual connectivity with the secondary connection being satellite. The respondent quotes the following in the context of the agility of any feature or functionality to be turned on or off depending upon the requirement.

> *"Being able to have something that's turned off and then there is a feature that is enabled at a later date is also another area where more and more we want to do that."*

This ability to turn on/off the features assists in change management and training as the primary stakeholder BD-A often needs to be involved simultaneously in several airport upgrades. Several versions of production environment run for training purposes where this feature allows them to switch over from one environment to the other once it is felt that the personnel are adequately trained in one environment. This offering also helps to manage change across different time zones as per the following quote:

> *"Also it means that London is usually midnight or between midnight to 1 AM. It means we can do their changes during our day and other changes during night."*

The compliance issue to an extent is also addressed by the turn on/off ability which is supported by the data when it mentions mobile check-in, allowed in New Zealand, UK and US but not in Australia. If ever the mobile check-in be allowed in Australia, it should be simple to implement by a change of flag which will make the service available to them. The core offering from the BD-B is the end to end solution for the bag drop case which includes an application for passenger use. Other offerings of the organisation as deduced from the primary data are:

- Conceptual design from start.

- Consultancy.

- Carrying out the mechanical and electrical aspects.

- Software integration and development.

- Networking.

Critical Success Factors (CSF)

1. TAP: These are the CSF

   - Fulfilling of transactions: This is the foremost objective of the service that is essential for its success. The success of a transaction results in the

parking ticket issue or an error message on the display panel suggesting the reason for non-delivery of a parking ticket.

- The secure, quick and effective way of parking: These are customers' views when they opt for a mode of paid parking. The parking solution needs to have these factors for success.

- The solution in real-time as per modern standards of communication: The delivery of tickets is expected to be real fast, almost instantaneous. The payment solution meeting contemporary standards of communication ensures it is robust and secure. These factors will guarantee success for the service.

- Immediate response towards accepting or declining a transaction: This factor is a must for the TAP service to sustain as it is a measure of the responsiveness of the scheme. Thinking from the user perspective - around five seconds could be the maximum time allowable for receipt of a suitable response. Here the capability to decline is also important if the customer is on a prepaid account and does not have sufficient funds.

- Planned outages for system maintenance: Outages that are pre planned are necessary to maintain equipment in well-oiled condition for their smooth operation. The planned outages are indispensable for the upgrades to software and hardware. These upgrades also enhance the functionality. These outages are scheduled to be carried out on off peak hours when the system demand is very low. Therefore, proper choice of outage time is another key factor.

- Measurability (of up-time): The expectation as per SLA (service level agreement) of up-time (the time for which the service is available) is about 99.995%. The service is allowed to be inoperable for only 1-2 hours per month based on the requirement of up-time.

- Increased usage: As per the data available there is a trend of increased customer usage every month of the service. This factor too contributes to its success.

- Quick rectification of faulty machines: If the machine is defective, there is a bunch of technicians available on call, and they try to repair/rectify the fault within 30 minutes as per the SLA.

- Contracted and documented SLA: The contracted and well documented SLAs play a crucial role in the smooth operation of the system.

- Requirement to report outages within a specified period: The outages are tightly monitored and this contributes to the success of the service.

- Robust revenue structure: The foundation of the service is on a solid mechanism of income generation, where all the partners seem to get their share in more than one way and are happy and content.

- Innovation to show a market leading position: As per publicly available data (source: organisation website for parking vendor), this was first invented by the parking machine hardware vendor and was a first of its kind in the world using a mobile phone for payment.

2. HI: The following factors can be termed as success factors for the health insurance case:

   - Account Management: An efficient account management was regarded as the key element for quick response and fast turnaround times.

   - Mutually dependent relationship between the primary stakeholder and other partners: The main stakeholder ensures success by treating its relationship with each of its partners as a partnership and that there are escalation path and a point of contact with their partners.

   - Communications: From the data collected, the emphasis on communication seems to be inherent in most of the responses although not explicitly mentioned. Understanding all the processes and their effect on time lines in a project which has collaborative network partners is an important issue in project governance. With effective communications, it becomes possible to acquire an understanding of the processes and the resulting effect on the project time lines.

   - Understanding priorities of each other: A critical factor in the success of HI projects is to understand each other's priorities regarding backlogs.

   - Ability to deliver something quickly: This refers to the capacity to reach the market with a product which has at least some minimum functionalities. This is, in contrast, to waiting till all the features are ready to be delivered, which would not only be more time consuming but a test of

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the customers' patience. Consequently, these factors will have a negative impact on its success.

- Focus on minimum viable products (MVP): Any product that needs marketing is never over engineered or polished to make it perfect. The focus lies on offering the most value in a completed product that does not leave any debt on the department or the organisation.

- Following the agile principles: Based on agile methodologies, the ability to deliver the minimum necessary functionalities as quickly as possible is critical to the success of a project.

- Ensuring the competence of partners through reference checks: The HI organisation being the primary stakeholder values account management and understanding other partners' businesses and drivers very highly. According to the data available, this is an essential feature in dealing with the partner's change management processes.

- Formation of small teams to handle the backlog efficiently: The primary data highlights the use of various smaller teams over a single large team when it describes how the core team of 20 is broken into three teams to handle multiple projects at the same time. It allows those teams to release the project at different times, so one of the teams could be made available fairly soon if there is a change in requirements or market conditions to attend to this change. The following quote is relevant to the above context:

> *"So one of the pieces that make us so agile is that our core team, the largest team is broken down into three streams, and a lot of that is because otherwise, it will be a team of 20 which does not work really well with the agile principles."*

As an excellent example of what has just been explained is the partnership of the HI primary stakeholder HI-A for an insurance product for another organisation in the retail sector. As the primary stakeholder organisation has been following agile principles of working in small teams as described above, they could get the white labelled business from the retail sector organisation. This business was obtained by re-prioritising and redistributing work between the three teams so that they could start working on the RFP first. After acquiring the project, all the teams

phased out their present work, one by one, and switched over to working on the newly acquired work. They phased the work as it got understood. The following quote supports these:

> *"We had some high level requirements that we had to start working on and understand what each meant and what changes needed to be made so we could not have a full development team working on that from day one. So we had to phase the work as it got understood."*

3. SIM: The critical success factors for the SIM project case by primary data analysis are described as follows:

   - Prompt request response cycle: If there is a requirement to replenish the SIM card stock, the relevant collaborative partners co-ordinate through emails and/or web portals and follow it up with phone calls to get it done promptly.

   - Quick and easy access to critical data: All the essential information e.g. purchase orders and serial number information are readily available for retrieval from network drives and databases.

   - Communication: Communication at different layers at the right time and for the right reason has been one of the most important factors for this project. The need for communication was found in several instances in the course of data analysis of the case. An example quoted refers to the case when the primary stakeholder feels the need to have the software application enhanced, by adding a particular feature. This addition is likely to result in a betterment of the process. Consequently, it triggers a chain of activities that require communication at appropriate levels to get the feature implemented.

   - Effective information exchange: At various stages of the operation of this project, critical information exchange takes place. The information exchange occurs with regards to the SIM card details as well as the top up and activation of SIM cards, once they are sold to the customers. The success of the service relies heavily upon the effectiveness of this factor. The information exchange as the data tells us, serves the following important purposes:

(a) Tracking.

(b) Auditing.

(c) Stocking and distribution of SIM cards.

(d) Invoicing.

(e) Rebate processing.

- Usage of Agile processes and Responsive measures: There seem to be several examples of usage of an agile business model where the solid revenue structure is at the forefront. Every partner in the project gets a fair share of the revenue. The business model seems to be self adjusting which is not affected by market fluctuations. The project has a pluggable architecture that has been demonstrated by the addition of all SIM service providers in the local market over the last few years although it has started with just two. There is the following quote that may be of some insight:

  > *"agile business model is being followed very well because they have established one system and that follows a sets of processes, and it is maintained even when new products/providers are plugged into the system."*

  The model seems to be responsive with one example being the rebate scheme on top up and activation of SIM cards to reward the retailers who are direct customers of the main stakeholder. The scheme is responsive between the partners as evidenced by the request response cycle being recorded in emails and web portals. The responses at the appropriate instances within acceptable time limits is responsible for the success of this project so far.

- Robust revenue structure: One of the main success factors for this project has been an existing revenue structure which was already founded. Based on the current revenue structure an add on was done by the main stakeholder in collaboration with the other major partner, who provided the infrastructure and the software/hardware platforms.

- Usage of existing distribution and sales network: This project has taken advantage of the pre existing and proven distribution and sales channel for

the main stakeholder. The sales channel contains an elaborate network of sales representatives and retailers who work in close co-ordination to sell with the objective of getting the SIM cards to the customers.

- Careful planning to minimise extra resource addition: Careful planning went into the stage of feasibility studies of the business model for this project. The planning ensured the usage of existing resources at the disposal of the CN organisations with any additional resources kept at the minimum. So with minimum investments through the usage of available resources, the project was made up and running.

- Ensuring the adequacy of a communication channel between the partners: Like other factors described earlier that are crucial to the success of a collaborative venture, there is the factor to ensure that an adequate and appropriate channel of communication exists among the partners. At the time of formation of the business model, it was determined that such a channel already exists. It was just an extension to use the existing communication channel for this project.

4. BD: The bag drop case about the airlines has the following critical factors for success:

   - Effective Communication: As taken from the respondent quote, as an airline they take the culture of no surprises. The interpretation of this is that they discourage keeping secrets by the staff on issues of critical importance. In other words, sharing of information during project discussions is encouraged as it may save them from exposure to risks later regarding not meeting delivery schedules or finding themselves in a bottleneck on an issue. In the airline industry, any risk that is known before could well be managed, and a plan B can be considered. On the other hand, if something that could be a potential risk is not shared between the project team members, it can lead to serious problems later. The block of quote that supports the above explanation is:

     "I think here we take the culture of no surprises. You can come to a dangerous situation if you try and protect people too much as far as not necessarily disclosing 'hey there is something around the corner'."

In general, in the entire data analysed for this case, there is an over-whelming emphasis on the success of the projects in terms of the way the communications are handled in team meetings. Sharing knowledge has emerged as a key factor for the progress of projects in all areas within the airline sector.

For the baggage integrator organisation BD-B, the communications play a major role in the success of any issue resolution for the main stakeholder, the airlines or BD-A.

- The speed of delivery through responsiveness and agility: The speed at which the upgrades get completed plays a vital factor in this industry. The present case talks about five airport upgrades within a short span of six weeks. Here the major stakeholder performed well in extreme terms and requirements. The airline, being an emergency industry working practically twenty four hours a day for seven days a week, cannot stop any of it's flying operations for performing these upgrades. It, therefore, has to be quick to implement the upgrades, so as to create the least amount of disruptions for a limited time. These upgrades are the result of competition entering the market and the arrival of new fleet causing more passengers to be handled in the same footprint. The critical success factors are the business agility and responsiveness which allowed the project to be delivered within schedule responding both to the market conditions and customers' demands. The major stakeholder was quick to respond to customers' expectations of a larger number of touch points as well being another option to the staff assisted bag drop. Meeting both of these expectations was made possible through self help kiosks for check in and bag drops which is the case under study.

- Tracking and Managing customer issues: This is another critical factor for the success of the upgrade project. An effective way of dealing with outstanding customer (airport) issues keep the airport authorities happy and ensures that airport operations undergo smoother transitions in their return to normalcy.

The major partner BD-B to the main stakeholder airline BD-A uses tickets for tracking and resolution of issues. The former tracks the issues till they are resolved and search for any issue that stays longer than a

given period for further investigation and resolution. If in their opinion, the persistence of a particular issue proves hindrance to business as usual, they try for a quick-fix solution first before looking further for more insight.

- Governance: Due to the very limited time for this project, the governance played a key role in the success of the upgrades. The approvals for various items and processes were simplified to keep it on a fast track. The new style of governance that is emerging, as the data suggests, promises to help fund and support the new project for ongoing operation and maintenance, once completed.

- Change Management: The change management is another area of importance upon which the successful transition to business as usual, depends on after the upgrades. Since this service was new to the organisation, staff training was heavily linked to change management. This change management including training was however quite effectively handled by agile processes as evidenced by the data analysis.

- Planning and Vision: It is evident from the data that planning well ahead of time with vision on the possible bottlenecks made the project delivery possible as per schedule. Some of these being the determination of the long lead items, the infrastructure required for the project as well as the project plan.

- Time management: Basing the change management activities on correct timing for carrying out the different processes was an important criterion for success. The change management that was performed thus includes the introduction of features of the new system in small steps in an agile manner, rather than everything in one big upgrade. This statement is supported by the following comments of the respondent from the airline organisation:

  > "I think time is the big one. It's the fact of over the period only taking calculated smaller steps rather than a big bang everywhere or all at one time."

- Co-operation with CN partners: The airline co-operated with the baggage integrator organisation to feed them with all the information and

resources required, in time as they had a short time to market the service. However, effective communication between them in an agile manner made this possible. The communication effectiveness ensured successful delivery of the project, meeting the customer requirements, on time as per scheduled for the project

- Optimisation of manpower and resources: Better utilisation of manpower and time built into the business model for this case is an important factor for the success of the project. With the introduction of this service, the staff of the major stakeholder can manage multiple passengers rather than just one. The quote below suggests that the service handles more passengers with the same number of staff during peak periods and can allow reduction of staff during off peak periods when the passenger load is low.

  "Our staff can manage multiple people rather than one person, so either better deployed or throughout peaks and troughs do you need as many staff? "

  As the data analysis shows, there could be actual staff cut by 1% at larger airports through the deployment of the self help bag drop service.

- Proper scheduling of work and access: As per the comments of the respondent from the baggage integrator, BD-B below:

  "I think one of the big things there is really ensuring business as usual is able to continue at each of the locations that we did installations. So that was one of the biggest considerations needed to be taken as they can't stop flying the aircrafts into the different airports."

  It does not need much explanation to see that for the project to succeed, work was needed to be scheduled in a manner to cause minimum disruption to the regular operation of the airport. The critical factor here was to schedule work and access to certain areas in a way that has no major impact on the airline or its passengers. The scheduling of work access was handled effectively based on their understanding from previous experiences.

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The other focus of this factor was to maintain passenger and carrier safety while carrying out the work.

Degree of Unbundling

1. TAP: This service is largely unbundled as the analysed data from the mobile payment provider, TAP-A shows. The local governing body, which is the main stakeholder and owner of this project has outsourced the integrated part of technology delivery to TAP-A and execution of the project to the parking hardware supplier organisation. Present day market trends show that organisations are moving towards outsourcing which is likely to stay that way in the foreseeable future. The outsourcing model which is an example of unbundling is being reinforced with the advent of cloud delivery mechanisms. The respondent's comment below shows that the acceptance of unbundled services are on the rise and tend to align towards the cloud providers/operators.

   > *"Cloud has given birth to more acceptance in the unbundling of service and to align it with service providers that are cloud owners."*

   The data gathered points to the fact that many of the organisations are open to unbundling and also willing to work in a CN with partners. It also seems that the trust on the cloud as the vehicle for Software As Services (SAS) is on the rise. The government sector is possibly considering TAS (technology as services) as a service in that sector.

   Further analysis on this theme indicates that possessing specialised skills by the organisation is a pre-requisite for organisations to be working in an unbundled configuration. This was quoted by TAP-A during the data collection interview:

   > *"They have gone to the industry obviously many years ago when the tenders were first awarded, and they went to parking machine vendors and said "you tender for this, why as you are the experts in parking machines, etc. etc. and the pedigree around that".*

   The respondent from TAP-A suggested that they are also leaders in mobile computing communications and view vertical integration to have been outdated as an industrial trend.

2. HI: The data from the case pointed to the advantage of outsourcing certain sections of a project to an external agency. This part of the project involved co-ordination and relationship management between a couple of departments

of the main stakeholder and another partner in the CN. The finding was that outsourcing to any level which is synonymous with unbundling, at least for the present research, works towards the greater objective of the organisation. However, the case also highlighted the relative advantages of a degree of integration and disadvantage of working in an unbundling (or to work with external collaborative partners) manner. The disadvantage was in the difficulties encountered in project governance and in understanding the priorities and constraints that a non-owned entity causes for the main stakeholder. In the opinion of the respondent, there could have been an escalation path for following up and a lot more understanding of priorities, if they at least partly owned that entity. Another merit of working with an owned entity (that represents a degree of integration), is working towards achieving a strategic objective of the main stakeholder organisation. Within this health insurance organisation, it was revealed that all the departments whether they are locally situated in New Zealand or overseas in Australia, work for the same strategic goal of the organisation as this quote suggests:

> *"So no matter if you are working with the infrastructure team in Australia or the dev team here or support, you are working towards one thing."*

This case also has several partners involved in delivering the health insurance product and for the delivery of the final product, every one of them needs to do their part and do it well. The support of the HI organisation respondent as seen from the data, for a degree of integration is exemplified by quoting an instance of the takeover of a travel insurance organisation by them. Before this takeover, they were engaged in white labelling the travel insurance organisation's product as their own and encountered lots of issues dealing with them. They could not get the travel insurance organisation to deliver a quality website and to implement changes. This changed after the HI organisation bought the latter organisation with the establishment of an escalation path, having them work towards the strategic goal of improving the travel insurance product across the range for health insurers.

3. SIM: This case brings about another merit of integration which looks at the ease of making decisions without waiting for consent from other partners of the network. Here is the quote from the data:

"I think there is a disadvantage that you have to wait for all partners to respond. As your companies are owned by different management, so to make a decision, you'll wait till everyone responds and agrees (to it). You alone are not allowed to go ahead with your decision."

Many meetings with the need for all the partners to be available in this case is an obstacle in the view of the respondent who opines that businesses need a quick response.

The view further suggests that vertical integration could have been preferable for better manpower resource management owing to better control and knowledge of their abilities. The respondent feels that within a single unit or vertically integrated organisation there is more commitment towards gain or loss. He says that if there is a loss, then only that organisation loses so there is a stronger motivation towards working for gain or profit.

This stronger motivation is somewhat consistent with the observation of HI organisation where it was found from the respondent's comments that if the the major stakeholder owns the entities, they all work towards achieving a common strategic goal of the organisation.

An inference is drawn about linking strategic goals with achieving profit or gain and hence the conclusion about consistency in these two cases as stated above.

4. BD: The bag drop case of this research brings out yet another unexplored area of intellectual property (IP) linked with this theme. The data analysis reveals that if the work or project requires IP which is airline related, they will not outsource the job to external partners but will get it done through their business analysts. On the other hand, out of the box or generic ICT jobs involving networking, databases, operating systems of Unix and Linux are outsourced to CN partners like Gen-i, Spark, Dimension data and several other suppliers who are generic IT or business partners. The advantage of working in this manner is that it helps retain airline specific IP. Another factor is that those business analysts act as translators to collaborative IT people as they possess expert knowledge of the business. The major stakeholder, the airline organisation, sees the advantage of working in a semi-unbundled structure in that it allows them to retain their IP. To build their IP and retain it, they

keep on certain skilled and experienced resources within other collaborator organisations on their (major stakeholder) account. The latter achieves this through putting suitable service level agreements in place. The SLAs provide the advantage of ensuring that skilled people are always available for the main stakeholder and hence help them in building the IP.

As per the other respondent from the baggage integration organisation (BD-B), there are both merits and demerits of a level of vertical integration and unbundling. In their words, they could be termed as a "one stop shop" for end to end solutions for airports carrying out practically everything from providing a conceptual design and consultancy, handling both mechanical and electrical aspects, networking, software development and integration. That indicates that they have a substantial level of integration. If they get the whole project, the upside is that they will have the profit all for themselves. Otherwise if unbundled, they will need to work under financial constraints and look to protect their profit margin. However, in this case of working unbundled, they will have to shoulder less responsibility as the networking will be the responsibility of the airlines. The latter know their responsibility and can implement the networking a lot quicker. If the baggage integrator handles the entire project, they will have to ensure that the project is fully functional, all by themselves.

Critical Constraints

1. TAP: In the view of the respondent from the TAP project, the critical constraint is the tightness of vertical integration. The data suggests that the respondent has observed that over the last two decades, it was not possible to disrupt the process as nobody could get an entry if it were a defined process. His comments form the basis of this conclusion, as follows:

   > *"I think the vertical integration is, if one thinks of it in my 20 years of business experience, in the old days you couldn't get in if it was a defined process. You would never be able to disrupt the process."*

The inability to disrupt the process seems to be a critical constraint in the success of CN ventures.

However, further research is needed to support this hypothesis.

2. HI: This case reveals how the lack of flexibility in a product functionality could pose a serious constraint in the success of a product at least in the initial stages. The organisation started with a health insurance product on its newly developed website and introduced a product for joining on line on the assumption that only two members of a family (either husband-wife or boy friend-girl friend) are most likely to join. They found that hardly anybody was using the on line joining functionality. Later the HI organisation, on investigating, found out that most of the customers have more than two people e.g. husband-wife, and two children who would like to join. They rectified the functionality ultimately to allow more than two people to join on line. However, they possibly may have lost a bit of customer goodwill because of the inconvenience it caused them when they could not use the web version at first instance. So it may be concluded that if the organisation had the vision to make the joining process more flexible by including children, it might have saved them the embarrassment later.

Another critical constraint is that different collaborative partners work in various ways. What may be considered as fast or quick for the major stakeholder may not necessarily be for their partners. The interpretation could be that if a week's time is thought to be quick and fast to implement some changes by the major partner, in the view of another partner even a month's time may be quick enough for the same set of changes. The conflicting requirements of the various organisations of the network that crop up when a requirement traverses from one partner to the other also contribute to delays in getting work done. This constraint can at least be managed more efficiently by proper account management as the data analysis of the data collected from HI organisation response suggests.

The following comments directly from the respondent is self explanatory:

> *"Some of the processes around implementing change and even getting our change put on their backlog and actioned, if you like, can take a different amount of time and lot of that come down to the account management part to make sure that enough notice is given for what we want to get done and why?"*

Lack of efficient account management can also prove instrumental in an external party to acquire the business which the HI organisation was interested in. This is aptly mentioned and explained in the respondent's comment below:

> *"As an example do everything that we need them to do but if we don't understand their business at the same time, it is not going to work because we don't know what drivers they have which means it is very hard for us to react with the changes they want us to deal with."*

Finally, this case brings out the fact that working with external organisations even in a CN has the major constraint in that commercially sensitive information cannot be shared with them.

3. SIM: No data available on the main constraints. The comment on market unpredictability reveals that the SIM services are more or less immune to market volatility, so it is not a constraint.

4. BD: Treating complex transactions at par with simple transactions in the earlier service was a critical constraint in a sense that a passenger, flying to a destination which is a simple transaction, for example, Sydney, needed to stand in the queue behind some one whose destination, like Zanzibar, involves a more complex transaction. The requirement of standing in queue irrespective of the complexity of transactions is assumed to be one of the considerations behind the new self-help check in and bag drop service. The handling of change management that involves staff training and a learning curve for passengers, especially those who were used to the staff assisted service for a very long time (say 15-20 years) had proved to be a constraint at least for the initial stages of change over.

A critical constraint for the baggage integrator organisation is to implement changes to a mechanical component, which is already at the fabrication stage. To do so will require the stopping of manufacturing, abandoning the partially manufactured components and restarting the process again, which is neither time nor cost effective and a complex process.

A common constraint found throughout the case analysis of the major stakeholder airline and the baggage integrator organisation is the lack of effective communication between the CN partners. Competitors entering the market do also act as critical constraints which necessitate emergency actions by the major stakeholder to survive in the market. They need to devise ways and be agile in order to cope with extreme terms and conditions, with a view to meet almost impossible deadlines, as the case analysis suggested.

In New Zealand, the major stakeholder airline organisation have limited network capability especially to airports which are in the outer parts of the town. So, in the case of Invercargill, for example, which is across the river from the town, the only option with them is to use DMR (digital mobile radio). It is observed that this technical issue is one of the critical constraints for the upgrades. The respondent comments as extracted from the transcript of the interview is presented below:

> *"New Zealand being what it is, we have limited network capability especially to airports which are on the outer parts of the town, so Invercargill for example is across the river from the town. So our options on how we supply our network services are quite limited. There's only unless we drag out in fibre which we really don't want to do, we have to use DMR (digital mobile radio)."*

Summary of thematic cross-case analysis: Summarising the cross-case analysis for the themes as follows:

1. **User Experience**: Two of the cases, TAP and BD, were unanimous in having a user interface that is simple and easy to use. The SIM project did not bring any data on this theme. The HI organisation continues to offer an on line web experience for some of its products and stressed on the graceful and elegant ways of exiting the website in the event of malfunctioning.

2. **Core Offering**: Core offerings of all the four cases were unique, and no matching pattern was observed because of their differing types of business.

3. **Critical Success Factor (CSF)**: Here there was an overwhelming explicit response for effective communication among the CN partners by three of the cases. Two of the cases, HI and BD stated that they usually work to deliver something quickly in smaller steps rather than wait to deliver everything in one go.

Both the TAP and SIM cases are based on a robust revenue structure which the analysis revealed. These two cases spoke out about the criticality of a quick request response cycle in the context of delivering the product or service as relevant to the cases.

Use of agile processes and responsive measures were quoted by the respondents for the SIM and BD project as being responsible for efficient delivery mechanisms. The HI case also tends to follow the agile process as per the data analysis.

Proper planning for optimal usage of existing resources was expressed in one way or the other by all four cases as being critical to the success. Tracking of customer issues and traceability was found to be a common pattern among three of the cases in TAP, SIM and BD.

4. **Degree of Unbundling**: All the cases are working unbundled to a significant extent to carry out the CN ventures being studied in this research. While there was quite a strong emphasis on the merits of large degrees of unbundling by the TAP respondent, the others were more open to the relative merits and demerits of both unbundling and a level of vertical integration. The HI and SIM case opinions have a tilt in favour of vertical integration.

As per the cross-case analysis, in the opinion of one respondent (TAP), the emergence of cloud computing is playing a significant factor in the acceptance of the unbundled model and the possession of special skills to be necessary for working unbundled in a CN as per three of the cases except SIM.

Three of the cases, except the TAP case, brought out several merits of working with owned entities (level of vertical integration). The merits enlisted were; a known escalation path, more understanding around priorities, motivated to achieving strategic objectives of the organisation, ease of making decisions, better resources utilisation, retaining intellectual property, having the financial gain all to themselves.

However, all the cases seem to be aware of the opportunities that working in a CN brings where they have to work to a great extent as unbundled.

5. **Critical Constraints**: No data was available from the SIM case about the critical constraints. Other cases highlighted differing factors that could be classified under this theme.

The TAP case brought about the issue of tight vertical integration of the past two decades being a major constraint at that time. However, it does not apply to the present case as they are working unbundled on their specific task.

Lack of flexibility in the joining process functionality of an on line product proved to be an constraint for the HI organisation, at the initial stages, although they have rectified it since. In the conclusion arising out of this case, an inefficient account management comes out as a critical constraint for the delivery of health insurance products. Inability to share sensitive information with the partners was also quoted by the above organisation that proved a constraint for the management of projects.

In the bag drop case, the complexity of transactions for check-ins for some locations in the earlier assisted bag drop case was one of the constraints. However with the self assisted bag check-in and bag drop case, it will not be a constraint any-more.

For the bag drop case, one of the major constraints was the implementation of a change management process in which both the airline staff and the passengers needed to undergo learning curves to come to terms with the new service. In this case, adopting an agile process for mechanical components during the fabrication stage is another constraint which probably has no solution, since it is impossible to change a mechanical part or component which is already part fabricated.

Market competitions forced the airline organisation to react quickly to meet extreme terms and conditions and deliver a seemingly impossible deadline. Needing to work to meet a practically impossible deadline is a critical constraint as it is, which is further aggravated by technical issues such as putting networking options in place for remote and small airports situated out of town.

The cross-case thematic analysis of data is displayed below in Table 5.1. The table presents a quick overview of the various factors highlighted by the cases that could be categorised under those themes. However the information within the cells across a row does not perform a cross-case comparison on any particular factor identified within the themes.

The empty cells in the table indicate the non-availability of data for those cases.

Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
User Experience				
1	Easy to use (simplicity).	In case of the website (on line) crash, user presented with an elegant message or necessary steps to continue with the task.	No data available.	Saves precious time of the passengers by avoiding waiting in queues.
2	Agile and responsive. Quick to produce the result (tickets).			Simple interface to use.
3	System has the ability to be monitored in real time.			
Core Offering				
1	Real time updated transaction information.	Insurance products in health and travel insurance sector.	Sales and distribution network for SIM cards.	Self-help check in and bag drop service.
2	Mobile payment solution platform which is an easy way to collect revenue from customers.		EFTPOS machines being used by the retailers, who are the direct customers of main partner.	End to end solution for baggage integration including hardware and software.
3	Cloud hosting services.		Automated rebate processing on top up and activation for the retailers.	Conceptual design and consultancy. Software integration and development.

	Continuation of Table 5.1 (Core Offering)			
Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
4	Parking machine and hardware. All the servicing and maintenance support.		Communication and deployment channel between the various CN partners.	Mechanical and electrical aspects and networking.
	Critical Success Factors			
1	Fulfilling of transactions.	Account Management.	Prompt request response cycle.	Effective Communication.
2	Secure, quick and effective way of parking.	Mutually dependent relationship between the primary stakeholder and other partners.	Quick and easy access of critical data.	Speed of delivery through responsiveness and agility.
3	Solution in real-time as per modern standards of communication.	Communications.	Communications.	Tracking and managing customer issues.
4	Immediate response to accept or decline transaction.	Understanding of priorities between the partners.	Effective information exchange.	Project Governance.

| Continuation of Table 5.1 (Crtical Success Factor) |
Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
5	Planned outages for maintenance.	Ability to deliver something quickly.	Tracking which is useful for the following purposes: • Auditing • Stocking and distribution of SIM cards • Invoicing by main stakeholder • Rebate processing	Change Management.
6	Measurability (of up-time).	Focus on minimum viable products (MVP).	Use of agile processes and responsive measures.	Planning and Vision.
7	Increased usage.	Following the agile principles.	Robust revenue structure.	Time management.
8	Quick rectification of faulty machines.	Ensuring the competence of partners through reference checks.	Usage of existing distribution and sales network.	Co-operation with CN partners.
9	Contracted and documented SLA.	Formation of small teams to handle backlogs.	Careful planning to minimise extra resource addition.	Optimisation of manpower and resources.
10	Reporting outages within a specified period of time.		Ensuring the adequacy of communication channel between the partners.	Proper scheduling of work and access.

Continuation of Table 5.1 (Crtical Success Factor)				
Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
11	Robust revenue structure.			
12	Innovation to show a market leading position.			
Degree of Unbundling				
1	Largely unbundled.	It was found advantageous to outsource co-ordination and relationship management between a couple of departments of the main stakeholder and another partner in the CN.	Advantage of integration in terms of ease in making decisions without waiting for consent from other partners of the network.	The bag drop case of this research brings out yet another unexplored area of intellectual property (IP). If the work requires IP which is airline related, they will get it done through their own business analysts.

Continuation of Table 5.1 (Degree of Unbundling)				
Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
2	Main stakeholder outsourced the integrated part of technology delivery and execution of the projects.	There are relative advantages of a degree of integration since there is a known escalation path for following up and a lot more understanding among priorities, if an entity were at least partly owned by (integrated to) major stakeholder.	Vertical integration more preferable for better manpower resource management owing to better control and knowledge about their abilities.	Generic ICT jobs involving networking, databases, operating systems of Unix and Linux are outsourced to CN partners like Geni, Spark, Dimension data and several other suppliers who are generic IT or business partners.
3	Outsourcing model is an example of unbundling, and is being reinforced with the advent of cloud delivery mechanisms.	Disadvantage of unbundling was felt in the difficulties encountered in project governance and in understanding the priorities and constraints for a non-owned entity.	Within a level of vertical integration, there is more commitment towards achieving profit or avoiding loss.	Important to build and retain airline specific IP.

Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
		Continuation of Table 5.1 (Degree of Unbundling)		
4	Many of the organisations are open to un-bundling and also willing to work in a CN with partners.	Another merit of working with an owned entity (that represents a degree of integra-tion), is working for achieving a strategic ob-jective of the main stakeholder organisation.		Another advan-tage of employing business analysts is that they act as translators to collaborative IT partners.
5	Specialised skills are needed by the organisa-tion is a sort of pre-requisite for organisations to be working in an unbundled configuration.	If several partners are involved for delivering the health insurance product, every one of them needs to do his part and do it well.		Advantage of working in a semi-unbundled structure in that it allows them to retain their IP since they build IP in other partners through SLA's and those IP resources are on the account of major stakeholder when needed by them.

Continuation of Table 5.1 (Degree of Unbundling)
Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
6				The baggage integration organisation has a substantial level of integration carrying out practically everything from providing a conceptual design and consultancy, handling both mechanical and electrical aspects, networking, software development and integration.
7				The upside of working in a level of vertical integration or with the whole project is that they will have the profit all for themselves.

Continuation of Table 5.1 (Degree of Unbundling)				
Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
8				The critical factor in working with the whole project is that it puts an added responsibility of making sure the whole project works as expected. "Whole project" refers to a degree of vertical integration.
9				The downside of working as unbundled is to work under financial constraints while collaborators look to protect their profit margin.

Continuation of Table 5.1 (Degree of Unbundling)				
Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
10				The advantage of working unbundled is having to shoulder less responsibility as the networking will be the responsibility of the airline. The latter knows their responsibility and can implement it a lot quicker.
Critical Constraints				
1	Tightness of vertical integration. Over the last two decades, it was not possible to disrupt the process as nobody could get an entry if it were a defined process. This seems to be a critical constraint in the success of CN ventures. However further research is needed to support this hypothesis.	Lack of flexibility in a product functionality could pose a serious constraint in the success of a product at least at the initial stages.	No data available on major constraints.	Treating complex transactions at par with simple transactions, as in the earlier service of staff assisted bag drop was a critical constraint.

Continuation of Table 5.1 (Critical Constraints)				
Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
2		Different ways of working by various partners in a CN. The outlook towards measurement of fast speed or quickness of performing a task varies among them.		The handling of change management that involves staff training and a varied degree of learning curves for passengers had proved to be a constraint at least at the initial stage of change over.
3		Conflicting requirements between the various organisations of the network also contribute to delays in getting work done.		Implement changes to a mechanical component which is already under fabrication.
4		Lack of efficient account management is a critical constraint as it can also prove instrumental in an external party acquiring the business which the HI organisation was interested in.		Lack of effective communication between the CN partners.

Continuation of Table 5.1 (Critical Constraints)				
Serial No.	Txt A Park	Health Insurance	SIM Project	Bag Drop
5		Working with external organisations even in a CN has the major constraint that commercially sensitive information cannot be shared with them.		Competitions entering into the market necessitate emergency action by the major stakeholder to survive in the market. They need to devise ways and be agile in order to cope with extreme terms and conditions.
6				Technical issues such as limited network supply options for smaller regional airports like Invercargill, constitute a critical constraint. So, in this case, for example, where the airport is across the river from the town, the only option with them is to use DMR (digital mobile radio).

Chapter 6

Cross-Case Analysis of Sub Questions

6.1   Introduction

In any study, there are a few main questions that the research seeks to answer. To find replies to those main questions, each of them is broken into a set of sub-questions to help address the complete answer. This is usually done since the participants or respondents of the data collection interview may find it difficult to respond to the whole question because of the following reasons:

- The response to the main question may be too expansive or lengthy.

- The questions may be highly technical to be answered in one go. It always helps to provide sub questions that are related to the main questions but require only a subset of the response with regards to the latter.

- The main questions may be too complicated to understand and respond to.

For this research, there are two main questions which were first formulated in (Refer: Chapter 3, Section 3.1). Both questions were broken into several sub questions. The research started with a set of sub questions (which formed the interview questions as earlier mentioned in Section 1.4 and Section 5.1) and was reworded/rephrased for simplicity in understanding, without changing the meaning or underlying content. This rewording was done after the first case was interviewed, on the feedback of the health insurance organisation, the second case respondent. Thus, the new set of sub questions (or the interview questions) were put to the rest of the three cases, with the original set of sub questions being put to only the first case (TAP).

So for the sake of transparency and comparison, both the set of sub questions are reproduced. The original sub-questions are in italics:

The first main research question is as follows:

Q1. How to govern collaborative networks to achieve an optimal level of responsiveness for a given business model?

The sub-questions for Q1 are as follows:

1. *How do you define responsiveness for a network of collaborators?* How does your company react quickly and positively when dealing with issues involving the network of collaborators?

2. *Is there a way (that you know of) to have a measure of the responsiveness as mentioned above?* Are you able to measure this quick response during fast turnarounds of customer issues?

3. *What are the models of technology governance/governance structures being used by your organisation within this network of collaborators for running this project?* How do you govern this project with the ICT resources at your disposal?

4. *What are the challenges to the current governance model used with your network of collaborators for this project?* What challenges are faced in governing the project with your network of partners?

5. *What are the considerations that went into the formation of a business model for this project within the collaborative network?* What factors were taken into consideration while setting up this project in collaboration with other partners?

6. *How does the collaborative network implement (deployment and delivery of the product or service) technology governance for this project?* How the deployment and delivery of the product/service are managed across the business partners?

The second main research question is as follows:

Q2. How does the level of vertical integration (versus unbundling) in organisations affect the agility of their business models?

The sub-questions for Q2 are as follows:

1. *How do you define vertical integration within the network of collaborators you are working in?* Are all the collaborative partners involved in the project owned by the company?

2. *What is your view of an agile business model?* Is an Agile Business model being followed for this project?

3. *How will you measure it or in other words what could be done to measure agility?* Can the degree of Agility be measured by some means?

4. *What is unbundling of collaborative networks in your opinion?* Are all the partners responsible for different units of work/service that is finally delivered as one product?

5. *How do you compare it with vertical integration advantages/disadvantages)?* What are the advantages or disadvantages in having all or some of the partners owned by one company?

6. *How do you think an agile business model for a collaborative network of organisations creates defence against unpredictable market conditions?* How does the agile business model protect from unpredictable market conditions?

7. *How in your view could a vertical integration affect the agility of the business model for the collaborative networks?* How does belonging to a single organisation affects the agility of the business model for a network of collaborators?

6.2   Cross-case Analysis - Q1

After having listed all the questions and sub questions, each of them will be analysed case wise and discussed in detail. The original questions are in italics and the reworded questions in normal font as per earlier followed convention in Section 6.1.

6.2.1 Analysis of sub-question 1 data

The sub questions for the Q1 are discussed first as follows:

1. *How do you define responsiveness for a network of collaborators?* How does your company react quickly and positively when dealing with issues involving the network of collaborators?

   TAP: The data analysis from this case suggests that this organisation views the responsiveness both from the business as well as the consumer side. The customer's expectation from this service is around the fitness for purpose of the service, and that embraces the ease of use and the fulfilling of transaction. The customer expects to have a feeling of being able to park securely, quickly and effectively with the least amount of hassle in making the payment. If the entire transaction process is a complex one, it will repel the customers who are likely to resort to the old way of cash payment for parking. From the business perspective, the service will be responsive if the solution is real time adhering to modern standards of communication. From the customer perspective, the interpretation of real time is that the delivery of the ticket or a failure message should be almost instantaneous. On the other hand, businesses would like to have the ability to monitor the transaction information from the parking machine sites, in real time.

   HI: The analysed data from the health insurance case points to the importance of treating the CN partners as individual partnerships and in trying to make it work from both sides. The major stakeholder makes sure to deliver and receive whatever resources are required from the other partners. Another factor towards achieving responsiveness is the importance of account management, which is carried out by the contact person in the partner organisation to help in the process of communicating and explaining their priorities. An escalation path in the partner organisation is also ensured though scarcely needed.

   SIM: According to this case study, the partners in the CN react or respond to issues related to the project in different ways. For example, if stock replenishment of SIM cards is required, the major stakeholder communicates to this effect with the particular SIM service provider through emails and web portals. As these communications are all recorded, the quickness of response can be seen with regards to the request. To avoid any ambiguity in knowing the person to contact for such a replenishment, the point of contact is known

and fixed in the service provider organisation so that there is a minimum delay in processing the request.

BD: The responses of the two respondents, one from the major stakeholder airlines and the second from the baggage solution provider gave rise to a common pattern. This similarity was observed as both overwhelmingly stressed on the effectiveness of communication to be the main tool to achieve responsiveness. Both of them spoke about the need for regular meetings to get updates from all members, in particular from the team leads to share information and foreseen challenges with other team members. Foreseen challenges are known or those that can be anticipated in advance by the experienced team leads. The baggage solutions provider practices the idea of one to one communication for smaller issues which involve just one partner while resorting to the use of emails for communicating on larger issues involving a number of people, to be followed by meetings. All team members are encouraged to share their inputs, and these meetings are necessary to ensure that all are on the same page. They follow up these meeting points with further investigation, testing and steps to resolve. During the entire period till the issue is resolved, following up, through emails, is carried out to ensure actions are taken on these matters. As a further measure to improve the responsiveness, a manager is entrusted with the responsibility to keep in touch with the clients to update them while ensuring progress of the team.

Summary of analysis of sub-question 1 data   Summarising on the cross-case analysis of sub-question 1, it is deduced that two of the cases in HI and SIM view the responsiveness in different ways. Out of the remaining two cases, in the bag drop case, data collected from both respondents indicate a strong connection of effective communication that includes following up action on the issues, with responsiveness. The health insurance case also emphasises the need for effective communication although indirectly, in referring to the need of mutually satisfying each of the partner's information requirements from the major stakeholder, which is possible only through communication. The account management resource, as indicated by this case, refers to the point of contact in the partner organisation. The importance of this resource lies in the understanding of each others priorities within the collaborating organisations. The account management resource plays the role of conduit for effective communication among the collaborators.

The SIM project highlighted the quickness of response in a request response cycle that is also measurable as being responsive. There is a significant indication of the importance of effective communication in the smooth operation of this service throughout the data analysed for this case.

The TAP case associated the responsiveness with both the customer and business and emphasised that a high quality of experience for the customer qualify as being responsive. For businesses, real time information from the system about the transaction status is the main expected parameter of responsiveness.

In conclusion, the following factors have been found to be important for a business to be responsive:

- Effective Communication.

- Account management and escalation path in partners.

- Quality of experience.

- IT systems communication in real time.

- Quickness in response.

6.2.2 Analysis of sub-question 2 data

2. *Is there a way (that you know of) to have a measure of the responsiveness as mentioned above?* Are you able to measure this quick response during fast turnarounds of customer issues?

TAP: The case data suggests that the local governing body, who is the owner of this project expects the system to be always available. Planned outages for system upgrades are carried out at off peak hours at night when the demand is low. The responsiveness which is related to the availability or up-time of the system is measurable since it adheres to the service level agreement (SLA), where it is documented and is 99.995% which translates to only 1-2 hours of outage in a month. The operational SLA defines response time when a machine becomes faulty rendering parking there impossible. In such a case, the major stakeholder measures the SLA for a response time of 30 minutes for a service technician to go there and fix the problem. In the respondent's

opinion, it would be fair to allow up to 5 seconds response on the customer side to confirm or decline a transaction. The following quotation will state the rest of the measures of responsiveness:

> *"The responsiveness is definitely documented and contracted in the SLA. In fact, we have monthly reviews and weekly reports on the availability and up-times, whether it has met expectations in SLA's. If there is an outage, there is an SLA on that outage, and it has to be reported within a period of time so that they are very tightly governed because of the transactional nature of the product."*

HI: In attempting to define a measure of responsiveness, this case draws attention to the fact that various partners work in different ways applying separate yardsticks for measuring the time required for completion of a task. It again refers to good account management being the key to making sure enough time is given to a partner to complete the task. The account manager is also responsible for ensuring that the HI stakeholder changes are put on the backlog of the CN partner and actioned. There are conflicting requirements between the partners and the HI organisation with regards to an HI change request going to them for action. The conflicting requirement is applicable the other way too as when there is a software upgrade by the partner organisation, the HI organisation may need to retest their interfaces to ensure that partner services are always supportable. This retesting also ensures that partner organisation services are running on the latest technologies.

SIM: This case does not bring any new information on measuring the responsiveness, but stresses what was told earlier towards replying to sub question 1. The responses having been recorded on databases and network drives, are easily retrievable and can, therefore, serve to measure the time lag between the issues and their turn around times.

BD: This case observes that the speed of completion of a new project consisting of 5 airport upgrades in 6 weeks including installation and commissioning to be an adequate measure of responsiveness. During this project, all the customer issues were managed by using tracking and taken up for resolution. The use of tracking and resolution is a responsive measure by all means. The tracking ensured that the defects or snags do not exist after a reasonable period in the absence of stakeholder staff for whom manual tracking was an unrealistic notion as they could not be present at all the sites all the time. The response

from the baggage integrator considers responsive measurement from a software development perspective. The respondent commented the most common and yet often untold fact that the best measurement is through ensuring that the customers are happy. In their opinion, the communication link with the major stakeholder and project owners needs to be always functional. It is also concluded that achieving the SLAs in itself is a measure. They also use a tracking with a ticket system for issue resolution. Once an issue is logged, they try to make sure that it is tracked and closed within one week which depends on the severity of the issue. If the issue is so severe that it affects business as usual, then a quick fix is applied, and the issue is taken up for further investigation.

Summary of analysis of sub-question 2 data   Summarising on the cross-case analysis of sub-question 2 mentions the availability of the system or its up-time as a measure of responsiveness according to the TAP case. Satisfactory adherence to SLAs is another measure of responsiveness and emerged as a matching pattern in two cases of TAP and BD (baggage integrator).

Quickness in fault rectification and periodic availability reports as contracted in SLAs, as well as separate outage SLAs, form a part of responsiveness measurement which is documented, as per the TAP case.

The HI case response on this sub-question concludes that different partners have different yardsticks for measuring the time required for completion. However, no distinctly new information emerged about measuring responsiveness. The case emphasised the importance of good account management in giving a reasonable period to finish a change management task by the partner organisations. The change is two way, which occasionally flows from a partner to the major stakeholder HI organisation. So it may be concluded that an amicable collaborative working environment is necessary for achieving a fair amount of responsiveness.

The SIM case spoke of the responses to issues, raised through email, fax or other modes of communication that is recorded and hence, can be traced when needed. It can, therefore, serve to measure the time lag between the raising of issues and their resolution.

6.2.3   Analysis of sub-question 3 data

3. *What are the models of technology governance/governance structures being used by your organisation within this network of collaborators for running this project?* How do you govern this project with the ICT resources at your disposal?

TAP: The TAP-A organisation which is the MPSP, mentions that their governance processes and systems are audited yearly. They have a compliant and governance designed process which is transparent, and it follows international standards in the areas of governance and compliance. For this CN project, it is a participatory type of governance according to the case.

This sub-question was also responded to by the present owner and major stakeholder public enterprise who opines that they are not operating on a centralised model for this service. Various groups within them respond and oversee the contracts, finance, operations and IT part when necessary. In his opinion, changing the model is not straightforward due to the technical issues involved and the involvement of various partners. At the time of inception of the service, it was assumed to have a more centralised governance and was owned by a different local governing body from the present one.

The parking vendor organisation reveals that project sponsors were appointed initially from each major stakeholder who agreed to a deadline upfront for completion. They also provided authority to the project managers to have tasks completed in time within their organisation. The centralised model fitted best at the time.

HI: This case spoke about the most beneficial projects being picked up by the organisation for further action. The analysed data from the case brought little information on governance other than a passing reference to a comment as follows:

> *"So certainly project management and governance and account management, understanding where people are up-to in a particular project and what the requirements are on us is quite critical."*

SIM: According to the data analysed from the SIM case, individual governance by every collaborator in the network seems to be the norm. In that sense, it fits the participatory governance model [5].

BD: The major stakeholder, the airline, has governed this upgrade project in a decentralised manner especially about the procurement. The ICT governance has helped in carrying forward the larger organisation decisions to meet the objectives. However, respondent views brought about the idea of quite a few bespoke areas in the airline industry where just a few suppliers are only in the world or are specific for a particular product. In those cases, the best ICT governance practices (based on fair practices for acquiring software and providing organisations) have to be parked to one side. The reason for acting in this manner is quoted in the comments below:

> *"The decision is basically driven out of we might say that it's going to cost us an extra 100,000 dollars to do this, but it might it be on a 230 million $ aircraft. The actual scale in our organisation of the IT footprint in cost pales in comparison to the actual other costs in our business of fuel and aircraft and leasing itself."*

The baggage integrator did not bring any significant knowledge on the governance of this project from their perspective. Indications from the data emerge that to start with it was a centralised governance with BD-A being the key stakeholder. As such they had the main share of the policy decisions as part of the governance responsibilities.

Summary of analysis of sub-question 3 data Summarising on the cross-case analysis of sub-question 3, the TAP case brought to light the fact that at the initial stages of the project, the owning local governing body followed a centralised governance. The project had principal sponsors from each of the major stakeholders who were committed to a deadline for completion for the project following which they gave authority for the project managers to have the tasks completed on time. From the limited number of respondents (TAP-A, the MPSP), it is observed that the service is being run at present as a sort of participatory governance, where all the collaborators have the freedom to participate in the governance.

This observation is similar to the observation in the SIM case which views the SIM service as being governed in participatory configuration.

The present owner of this TAP project, another local governing body also states that it is not a centralised governance that their organisation is pursuing in this project.

The HI case did not offer any significant information on governance.

The BD case observed that a decentralised governance had been followed, by the main stakeholder, particularly for the process of procurement for this upgrade project. Since this was a fast track project, decisions related to procurement were quite restricted and rapid. The concerned departments had already chosen the business partners in an informal (without following normal protocol) manner, well ahead of time, to speed up the process of delivery. They did not have the time to go through the proper protocol for procurement, like advertising the request for proposal (RFP) and the like. The comments from the interview supports the above comments:

> *"It is decentralised. For this, really because it is a rapid project, the decision of procurement was quite restricted, quite rapid. So in the interest of speed of delivery, we had already decided who our business partners are going to be, we did not have the leisure of going right here is the RFP (request for procurement) and go through all of that stuff."*

There is another factor that contributes to their inability to adhere to the usual steps for the procurement process. There are many software and other products, which are of bespoke nature, where there are only a few suppliers in the world. Although this is against the best practices for procurement, there is a sort of compulsion to procure from those vendors, because of this bespoke factor as described earlier. To an extent, this is justified since the ICT footprint in cost pales in comparison to the other expenses like fuel and aircraft. The negligible cost of IT footprint could be explained by saying if the cost of a proprietary software was an additional hundred thousand dollars, this was on an aeroplane that costs 230 million dollars.

The following quote by the respondent explain the above statements:

> *"But often with this big organisation, particularly because quite a few areas are bespoke, so Engineering and quite a few suppliers are only in the world or they are particularly specific for that product and so even though from an IT perspective, it may not make sense to*

work with that software or that party, we sometimes have to because the decision is basically driven out of we might say that it's going to cost us an extra 100,000 dollars to do this, but it might it be on a 230 million dollar aircraft."

6.2.4   Analysis of sub-question 4 data

4. *What are the challenges to the current governance model used with your network of collaborators for this project?* What challenges are faced in governing the project with your network of partners?

TAP: The main challenges to the governance of the TAP services as evident from the data are about cloud based issues of attaining compliance around security. Data sovereignty in this country is a critical issue as people are not comfortable with data being hosted on servers outside New Zealand. The concerns on data sovereignty are applicable especially to those cases where all enterprise opportunities are networked to local government bodies. Vendor management is another challenge for the parking hardware vendors TAP-E (Chapter 4), who are in this role and they manage all the physical parking machines. The parking hardware vendors are also responsible for the availability of TAP-A database and to ensure the availability of networks provided by the telecommunications organisations. To achieve and maintain a resilient and robust system for process and security and standards expected of a global carrier, the TAP-A has to perform yearly tests on their platform to check its compliance. Penetration tests are also being carried out for checking data security and compliance which also ascertain that the mobile numbers are not leaked out. Then there are integration challenges to working the CN regarding links that may break down, which need governance. The ticket system for tracking and resolution of issues are all part of compliance and constitute challenges.

Transfer of knowledge if key people (sponsor or PM) leave the organisation constitutes a challenge as indicated by TAP-E, the vendor manager. It works well for short development projects (less than 12 months) – but not so well for ongoing development projects as per this respondent.

HI: Conflicting priorities pose a challenge which is alleviated through ensuring that enough time frame is provided to the partners and also that the people

being dealt with are competent. Lack of visibility when dealing with an external party (or CN partner) certainly seems to pose a challenge to governance especially with regards to getting a quality job when the things are not going well with the partner/s. More complex projects need better communication and understanding which is ensured by appointing project managers for the job. To summarise, the governance is about understanding the processes and their effect on the project time-lines.

SIM: The main challenge emerging from this case is about the right communication to be done at the right place and time for achieving goals. Issues like a non-functional server or a piece of software, bug tracking and change requests for development are the challenges faced by the major partner, SIM-B on whom the main stakeholder and owner SIM-A depends on heavily for infrastructure and software/hardware resources.

BD: For the airline organisation, the main challenge was unfamiliarity with the system for both the staff as well as the passengers when the service went live. The other challenges taken into account before and during execution of the project are:

- Long lead items listing.

- Project Plan.

- Infrastructure planning.

- Determination of the components likely to be required.

Apart from those listed above, the network planning for places where there is a limited network capability was another major challenge particularly for airports situated at remote places. The communication in the form of reporting by people at those locations was a key to meet this challenge.

The baggage integrator respondent holds the short delivery time to execute this upgrade as the only challenge. However they had the governance mechanism in place as project director at the top, who intervened in the issues that could not be sorted out by the project manager.

Summary of analysis of sub-question 4 data   Summarising all the responses for sub-question 4, a system for bug and issue tracking is a common

pattern that emerges from the data as one of the challenges for all but one case, that of HI.

There are challenges around compliance for cloud deployment of TAP service. Vendor management is another issue for this service and so is the transfer of knowledge when key persons leave the organisation. Maintaining compliance standards for data security poses another challenge for TAP-A.

Conflicting priorities around handling changes is the biggest problem for the HI case. Lack of visibility is another problem that could pose a serious threat to getting a quality product as per their experience recently with one working partner. Server and software related bug tracking issues as well as getting across change request for software development are the main challenges faced by the SIM case major partner, SIM-B.

Before the project execution stage, long lead items, the shape of a project plan and infrastructure and components going into the upgrades were the biggest challenges encountered by the airline, BD-A organisation. After the completion, unfamiliarity with the new system was the biggest challenge. For the baggage integrator, the short time to execute the project on behalf of the major stakeholder airline organisation was the only challenge noted.

6.2.5   Analysis of sub-question 5 data

5. *What are the considerations that went into the formation of a business model for this project within the collaborative network?* What factors were taken into consideration while setting up this project in collaboration with other partners?

TAP: The following were the main consideration in forming the business model when the project was started as per the analysis of TAP-A data:

- Customers need a process for making payment for parking.

- The interface for the customers should be easy to use.

- The service should be based on a sound revenue model to keep all the partners satisfied and engaged for a reasonably long time.

- The service should give a cashless option for payment that is secure from acts of vandalism as well as provide a secure solution for the transaction.

The following business consideration for this service resulted from the data obtained from the parking vendor:

The parking solution should be innovative to show a market leading position and unique point of difference that would be difficult for imported meter suppliers to produce. The need to increase revenues/profit by creating a want for New Zealand customers to upgrade their meters to allow TXT payment.

HI: The knowledge of and interaction with account manager [58] comes out from the data as being an important consideration in setting up the health insurance projects. A good rapport needs to be built with the account manager that should enable understanding each other's needs and priorities as the account manager is a crucial interface between the main stakeholder and the CN partner. Having an intimate knowledge of the partner's business drivers is essential to react to the changes by each one of the organisations. So there is a focus on reference checks for finding competence in the partner organisations through the people working in them.

SIM: Several factors were taken into consideration at the feasibility stage of the SIM project by the major stakeholder organisation, SIM-A. They are listed as follows:

- Potential market.

- Potential customers.

- Availability of resources at their disposal.

- A robust revenue model.

- Pre-existing sales and distribution channel in sales representatives and retailers.

- Communications channel.

The partners also made sure that they could work with minimal addition to existing resources and with minimum extra investment.

BD: This case was necessitated by the market demands for the major stakeholder with new fleet arriving and competition entering the market. As a

result of these factors, there was an expected increase of passengers with all needed to be served in the same footprint. The central idea is nicely elucidated by the airline organisation respondent:

> *"The central idea or concept was self-service. Concept behind self-service is you have the same footprint of terminal and leased space where you can transact more people. So it's not necessarily having less staff, its having the same amount of staff but having more touch points for the customers to transact themselves."*

Two important factors that were considered towards setting this self service are:

(a) Ease of use (Customer Experience).

(b) Optimal usage of time and manpower.

Of the above two, the first one is more applicable at smaller airports like Invercargill. However, larger airports can reduce the staff by 1% which was the initial consideration towards cost savings.

The baggage integrator perspective on factors being taken into consideration is all about maintaining business as usual at each of those locations where upgrading was carried out.

Summary of analysis of sub-question 5 data Summarising on the cross-case analysis for sub-question 5, there were similarities in considering a robust revenue structure for the TAP and the SIM projects. Further, the TAP case considered an easy to use interface which is innovative enough to take a market leading position. The increase in revenue/profits were to be addressed by creating a need for New Zealand customers to upgrade their meters to allow TXT payment.

For the HI case, it was most crucial to have a sound account management within the partners as well as the competence of people working in the partner organisations towards setting up HI services and products.

The SIM project owners had conceived the project idea as they were aware of several pre existing factors at their disposal, like sales and distributions channels, an existing customer base in retailers. The SIM service was also

conceived to utilise existing communication channels and hardware and software resources for further gains.

The BD case was initiated due to market forces and setting up considerations was simply to serve more passengers in the same footprint as the assisted BD service. The aim was also to provide an excellent customer experience at smaller airports and provide some cost saving through the optimum use of manpower and time. To maintain business as usual at each location where the upgrade was done, was the prime consideration of the baggage integrator organisation.

6.2.6 Analysis of sub-question 6 data

6. *How does the collaborative network implement (deployment and delivery of the product or service) technology governance for this project ?* How the deployment and delivery of the product/service is managed across the business partners?

TAP: Txt a park works off a server that is hosted in the cloud. The TAP-A organisation can physically deploy solutions rapidly.

HI: The HI case speaks about having clear and understood user interfaces for implementing their products. This understanding refers to how a particular partner organisation's web user interface that was linked to the HI back end would look like. It was also about how each of these two systems would behave (in isolation) if there is a broken link between the two. Although this organisation has built the redundancy in, they would be interested in analysing the cause of the broken link. The organisation would like the users to be presented with an elegant message that suggests them as to what needs to be done further to proceed in the event of a website malfunction. This organisation further stressed on the deployment mechanism as a critical factor. The reference to deployment is about which component lives where on the web. The deployment issue was considered for a white labelled product of an organisation say (HI-F) who were selling the HI products as their own and through the former's website. The content management part was looked after by the other organisation HI-F and the join flow function by the major HI organisation. The best solution that was worked out mutually was to have a navigation button on the HI-F website for customers. When they want to buy;

clicking the button can take them to the HI organisation website, where they are able to carry on with the joining process. Each of these two organisations would only need to work on their side; HI-F needs to look after their content management with their style and branding. The main HI organisation needs only to maintain the join flow functionality, which is theirs, and is reusable with different products and branding. We find that each other's change control plays a big part that needs to be considered before setting the business.

SIM: In this service, there is no cloud hosting involved. It has only the relational database that stores and manages all the data with the front end being presented to the users for processing orders. The orders are placed through an on line system SalesApp as mentioned in Chapter 4 (ref: Section 4.4.1 and 4.4.2) by the concerned persons, appear on the front-end of another application WarehouseApp as mentioned in Chapter 4 (ref: Section 4.4.1 and 4.4.2) as they use a common database. The major partners ensured that they possess their own contact centres and delivery partners to deliver physical SIM cards. The sales and distribution channel and the communication media are the other two channels that support a smooth physical product (SIM) and logical product information flow between all the CN partners.

BD: Here the main stakeholder data reveals challenges on delivery around dual connectivity. The norm for the airline is to provide dual connectivity for airport upgrades as a redundancy measure. At one point in time, during the upgrade, they had to bend that rule to let some airports to go live on one connection since the connectivity was not going to be available during the time frame. So there was a contingency situation which was managed by additional staff training and planning for possible failure for that connection. This case observes that the capabilities of not only the CN partners but their suppliers too play an important role in this short time frame upgrade project regarding cost and availability of functionalities and resources. The availability of fibre plays a critical role in providing networking and other IT services, so they had to follow this with their major partner and other suppliers to this effect. The key here was the effectiveness and timely communication of the need for fiber to all team members and having the project manager follow it up in team meetings to make everyone aware of the issue. In the case of the baggage integrator organisation, they put a plan in place before arriving at the site to start the work, to make everyone aware of the disruption it would cause. The organisation has the understanding from prior experience of working at

the airports, to prioritise the areas of work which may require electrical and mechanical isolation to be able to work in a safe manner. They have the necessary skills and are authorised by the major stakeholder to provide network infrastructure which was completed, although some constraints were faced in establishing the network connectivity and sorting the firewalls by the airline organisation. For the ongoing maintenance of the project, the software aspects are being supported remotely. The hardware part including the component replacement, as the data suggests, is looked after by a local contractor who has a service contract with the major stakeholder airline.

Summary of analysis of sub-question 6 data Summarising the cross-case analysis for sub-question 6, cloud is the deployment and delivery mechanism for the TAP service.

The HI case highlighted the deployment as to where each functional component should live (on the websites) and each other's change control (mentioned in the context of collaboration on a white labelled product with an external organisation), being crucial factors for delivery of their products.

The SIM case does not have any cloud service involved, so it provides contrast to the TAP service in this aspect. This case uses RDBMS to store and manage all information and a UI to process all orders which are placed on a web application that uses the same database as the UI. They have a delivery mechanism through courier to deliver physical SIM cards and use a sales and distribution network of representatives and retailers to market the product.

The BD case major stakeholder and owner provides dual connectivity for redundancy at airports to run the service that needs fibre for networks. The effectiveness and timely communications with the suppliers and team members played a critical role in this new service. The baggage integrator organisation put a plan in place for the actual upgrade work at the airports. They also prioritised their access areas based on prior experience, to work with minimum disruption to the business. Once the upgrade being over, they provide on-going software support remotely, and the hardware support is being provided through a service contract by another contractor.

6.3   Cross-case analysis - Q2

The sub questions for the Q2 are discussed as follows. The question in italics represent the original questions followed by normal font for the rephrased questions as in the previous section.

6.3.1   Analysis of sub-question 1 data

1. *How do you define vertical integration within the network of collaborators you are working in?* Are all the collaborative partners involved in the project owned by the company?

   TAP: The response mentions what may have been the integrated part for this service has already been outsourced. The explanation is that the owners or major stakeholders have given away two major components in the form of technology delivery (mobile payment solution) and execution of the product (parking machines delivering tickets or signalling error messages) to these partners TAP-A and TAP-E in the CN. Further interpretation of this data seems to show a bias against integration as it is thought to be an old concept in the respondent's opinion.

   The case brings about the response of the parking vendor which is quite straightforward to understand as follows:

   > *"Each major stakeholder supplies their own products or services which (may or may not have subcontractor suppliers). All major stakeholders and services are integrated to produce the overall solution."*

   HI: The HI response indicates that some partners are owned by the HI organisation while some others are not owned by them. The HI-A organisation infrastructure is an internal collaborator and is handled by their Australian division, and the development team is also an internal collaborator. Rest of the collaborators are external agencies.

   SIM: The data from this case indicates that all collaborators are working unbundled as independent organisations. However, all the collaborators work together and with mutual understanding to take a decision for this service.

BD: The major stakeholder, the airline organisation, is the leader and contributor to the project, meaning they are the main stakeholder. As per the information available from the data analysis, the ICT department is responsible for engaging properties and facilities area. Following this, they engage the services of external parties like BD-B, the baggage solution provider for services like this upgrade project. The baggage integrator data analysis reiterates the fact that the answer to the sub-question is a categorical "no" which means that the main stakeholder does not own the collaborative organisations. There is a project management company that was engaged. There is the airline organisation as the main stakeholder, there is the baggage solution provider, BD-B, and there is the installation company that the baggage integrator organisation engages at each of the airports and then the vendors of baggage integrator that they use to manufacture and supply various pieces of equipment for the upgrade project.

Summary of analysis of sub-question 1 data   Summarising from the cross-case analysis for sub-question 1 of main question Q2, it is revealed that all the collaborators in the CN for all the cases are independently operated organisations. These organisations are not owned in any manner by other partner organisations of the network.

The HI case illustrated that they are working as partly integrated to the extent that two of their collaborators in infrastructure and development teams are internal (owned by them), while others are all external to the organisation.

In the SIM case, though all the entities are non-owned by any other in the network. However, in this service, there is a collaborative decision process to be seen.

In the BD case, the major stakeholder works with two internal teams in facilities and properties, with whom they engage at the start of the upgrade. Initially, it operates in a slightly vertically integrated configuration. The data interpretation of the case seems to suggest that these two teams are engaged by the ICT department who are authorised owners of the project for the major stakeholder. After that they employ the services of external partners such as the baggage solution provider and the project management organisation

to work on the project. The baggage solution provider employs a manufacturing vendor to supply various pieces of equipment and also an installation organisation as their sub-contractors.

6.3.2 Analysis of sub-question 2 data

2. *What is your view of an agile business model?* Is an Agile Business model being followed for this project?

TAP: The TAP-A organisation stresses that they are agile in their operation as illustrated by the following salient points:

- API based interfaces.

- A platform having the ability to talk to all business use cases.

- Organisation system can be integrated into their engine.

- Customisable to deliver messages in a process that is governed by the organisational business.

All the points above are characteristics of a pluggable architecture that is agile. This service is also hosted in the cloud, and it could be deployed in any country, swiftly (for instance within a week), which is an example in agility. By their admission, they are exemplifying agility as follows:

> *"So agile in terms of development and agile in terms of deployment."*

The response from the parking vendor, in this case, is in agreement that being agile is essential when delivering new technology products and solutions. The respondent expresses that the organisations expect requirements to change to overcome barriers. This response is, however, restricting itself to the initial part of the project life cycle.

HI: This case looks at agility from another perspective of the working process where working in a sensible way on projects is synonymous with agile working. They work in a manner to extract the most value from a project as quickly as possible. An example quoted in this case is about deciding for only two of the four new products launched to be put on line. A technical issue necessitated this decision. These two products were selected based upon internal discussion

with sales teams based on the volume of sales observed in the past for the products. Once the initial problems regarding the join flow logic were sorted out, the team decided to put the rest of the two products on line as well. This decision was emphasised as being agile based upon minimum viable product as per customer feedback and was preferred over the instructions from the CEO to put credit cards functionality first.

SIM: This case also asserts being agile by following an agile business model. The usage of pre-existing sales and distribution network, pre-existing infrastructure and resources, pre-existing communications medium as well, for this project, does point to an agile working concept. There has been minimal resource addition and with minimum investment, it still works with a robust revenue structure that has proved profitable for all the collaborators. The CN could implement this service initially with two SIM service providers in which ultimately all the six vendors in the local market could be plugged in easily which is again an agile characteristic.

BD: The airline, which is the main stakeholder in this project has demonstrated agility through this upgrade project by its very concept of moving away from a many to one service relationship to a many to many relationship. This change in concept enables customers travelling to destinations that require simple transactions to check-in faster, as they are not required to queue behind passengers travelling to destinations requiring a time consuming and complex transaction. A decision was made almost half way through the project execution about sticking with the staff assisted bag drop till Christmas and after that to start the self-service. This reaction also points to an agile partnership. This decision was taken purely because around the Christmas time, the passenger loads are very high, and many of the passengers travelling for the first time, would have been inconvenienced if the self service was started at that point. In the words of the respondent:

> *"That was part of the decision made part way through and really that was an agile, it was an early test on one site and make the adjustment and change direction."*

In the baggage integrator organisation, agile principles are being followed for software development with morning scrum meetings. As the time was very short for completion of this project which included a software application development for passenger use, a close co-ordination and effective communication

with the airline organisation ensured that they received what they required from the airlines to complete the task.

Summary of analysis of sub-question 2 data   Summarising from the cross-case analysis for sub-question 2 of main question Q2, it can be observed that every one of the cases adhered to or implemented agile principles. The TAP project respondent from TAP-A quoting a few points on agility e.g. API's exposed to other businesses for use, providing a platform that has the ability to talk to business use cases, ease of integration of other systems to their engine and so on.

The HI case stressed on the usage of the minimum viable product that uses the concept of extracting the most value from a project as quickly as possible being an agile way of working. The SIM service operates on an agile business model that is practically immune to market unpredictability because of its self adjusting nature. Agility of BM for this service is also demonstrated from a pluggable architecture where all SIM service providers could be integrated without any trouble, although initially, it started with only two of them. It further highlights flexible usage of an existing sales and distribution channel as well as an existing market for the products. The SIM service reveals the usage of already available hardware and software resources with minimal extra investment. Finally the service presents the possession of a sound revenue model. All the above mentioned factors are the characteristics of an agile model of business.

The BD case highlights the agile way in which the upgrade project was handled. Agility seems to be embedded in the business concept of being able to serve many customers at the same time, without a queue up, with the new self help kiosks. Agility was also demonstrated in the reaction of the major stakeholder in taking a decision part way through the project. The decision was directed towards the timing of the introduction of the change that would benefit the passengers. The baggage integrator organisation views the working in close co-ordination with the airlines which ensured that they received the resources that they needed as part of the agile functioning. They feel that this agility has enabled them to deliver the tasks within the scheduled time frame.

6.3.3 Analysis of sub-question 3 data

3. *How will you measure it or in other words what could be done to measure agility?* Can the degree of agility be measured by some means?

TAP: Speed of deployment is a measure of agility as per the TAP-A case. Technology and cloud service gives them the ability to deploy almost instantly. As per the parking vendor measure of agility is the time to adjust, i.e. adjusted project milestones can be met on time.

HI: Here again, no particular statement or information emerges for a measure of agility. Only with regards to a qualitative measure, the focus was again on extracting the most value from a project as quickly as they could to achieve a considerable amount of work with a few resources. According to the respondent quote:

> *"We don't over engineer and we always ensure that, well we don't always succeed, we always try to ensure that we complete a project so that it's offering the most amount of value but also doesn't leave any debt for us or the business."*

Therefore, it is concluded that the case highlights factors that help achieve a sense of being agile and tries to establish a qualitative measure of that sense.

SIM: This case data attempts to put a measure of agility by looking at the way teams involve themselves in a project planning. The case further tries to explain it with the example of a hypothetical case of induction of a new SIM service provider into the CN by looking at making a cost estimation based on estimation for a previous vendor. Time frames can also be set up for the service provider to complete joining the team, that is one of the factors while calculating the degree of agility.

BD: Time, in view of the major stakeholder respondent, is a significant factor towards the measurement of agility. Introducing changes in calculated small steps rather than in one big leap is an agile measure. So as the product was implemented, all of the functionalities were not switched on at once. In an agile way, some of the features were gradually integrated. The change management was done this way for training the passengers by letting them have adequate time to become familiar with those features. The measure of agility from the

perspective of the baggage integrator has been the successful delivery of the project in time, as scheduled, meeting the customer requirements.

Summary of analysis of sub-question 3 data   Summarising the cross-case analysis for sub-question 3, it can be deduced that all the stakeholders that took part in the data collection for the four cases have their ways of expressing a measurement of agility. The TAP-A respondent made it clear that speed of deployment that is achievable through cloud technology is a measure of agility.

The HI participant was not explicit about a measure for agility but quoted about the way agility could be achieved by the concept of extracting the most value from a project as quickly as possible by completing it without over engineering.

The SIM case respondent also put his interpretation of agile measurement by mentioning the way teams involve themselves as the measure of agility. According to the respondent, within the project planning, setting up of time frames which could be met is another measure of agility.

BD case participant from major stakeholder also put an emphasis on time as a measure of agility although in a different sense. This case stressed the need for smaller steps for introduction of new project features at a time. This gradual introduction of new features (change management) plays a substantial part in training staff as well as the passengers about the new service. Timely and wise policy decisions like the one taken mid way through the project to keep the staff assisted bag drop scheme till the peak time around Christmas was also an agile step. The baggage integrator views the agility measure as the successful and timely completion of the project as per the project schedule, meeting the customer requirements.

6.3.4   Analysis of sub-question 4 data

4. *What is unbundling of collaborative networks in your opinion?* Are all the partners responsible for different units of work/service that is finally delivered as one product?

TAP: The case brings about the unbundled way that this service has been operating. The respondent from TAP-A expresses that the service has been running within the collaborative network of 16 local governing bodies, two telecommunication operators as carriers, the vendor, the MPSP (TAP-A) as the cloud services provider and finally, the customer. The respondent thinks it is connecting across functionalities in the business. Research data further details the respondent's views on the local governing body's working with the following highlights:

- Broad footprint (Inclusive of social services and extending to facilitating parking).

- Purpose – keep cities functional and working smoothly and be economically viable.

TAP as a service is continuing to work successfully as a collaborative effort for a long time. So no change was felt necessary to disrupt it.

The data reveals that the local governing body, the owner of this service, had outsourced the integration part from the onset of the project. Integration part is interpreted as being the integration of mobile payment solution platform with the parking ticket vending machines. It also represents the routine repair and maintenance services including the periodic upgrades to the machine hardware and software. The response further points to the fact that they had approached the parking vendors from the industry sector when the tenders were in the process of being awarded for the first time. The project owners had asked the latter to tender for the TAP service as they were considered experts in parking machine related services.

The data further suggests that cloud has provided more acceptance in the unbundling of service and to align it with service providers that are cloud owners. The respondent compared the way their organisation works in the cloud, with that of MS Office 365 which is an unbundled service offered through the cloud, where one can just subscribe to the services. This comparison of the functioning of organisations in the cloud environment with Office 365, validates his comments that unbundling has paved the way for the acceptance of the cloud. In this concept, the customer does not require to wait for a box of CDs to be shipped after paying for a license. In the earlier model, the customer would have to upgrade whenever the same were made available by

MS. The unbundled service for the same MS-Office is being offered at lower prices than before. The parking vendor commented on unbundling as below:

> *"The breaking down of each major organisations service or product."*

HI: The participant from this case mentioned that they do not have partners that overlap in any manner. The absence of overlap is interpreted as all CN partners are completely independent organisations for the HI services. Delivering an HI product requires everyone of the partners to do their work efficiently. To illustrate this point, the respondent suggested that if the provider organisation for all digital scanning solutions had not delivered the assigned tasks, the main stakeholder health insurance organisation would not get any application for claims form. If the payment provider for the health insurance organisation had not produced the deliverables, the latter would not receive any credit cards payment. If the main banker's application, trTool, had not been functioning, no direct clearance could be processed. So absolutely everyone has a discreet function, and each one is critical for the delivery of the product at the end of the day.

SIM: Data from this case suggests that all partners have been working in an unbundled manner and are responsible for their own units of work. As the service has reached the customers and is performing well, it is evident that the partners in the CN are performing their tasks efficiently.

BD: The respondent's organisation (major partner, the airlines) usually does not engage or employ from outside if they need intellectual property (IP). IP here means new products, processes, designs of the organisation, the result of innovation and creativity by their own resources. The interpretation of this section of the data is that if a project or part of it is IP related (means organisational business related), then the internal team of business analysts (BA) are assigned the job. Assigning the job to internal BAs has two benefits: Confidentiality of sensitive business information is maintained and the BA's act as a conduit of information translation between the Airline and its collaborative IT partners. The baggage integrator (BD-B) respondent notes the structure of the collaborative partnership is asserting that everyone works on his or her units of work in an unbundled formation. This organisation is responsible for delivering the solution. The airline organisation (BD-A) was

mainly responsible for network and communications and another project management organisation that was a collaborator was in charge of project delivery on time, within budget to meet the BD-A requirements.

Summary of analysis of sub-question 4 data Summarising the cross-case analysis for sub-question 4, it can be observed that all respondents have been working in their respective cases in an unbundled manner to a large extent. For two of the cases in TAP and SIM services, all the partner organisations seem to be fully unbundled, whereas in the case of HI and BD main stakeholder organisations, they have a degree of vertical integration built into the unbundled structure as the study reveals.

The HI case illustrated earlier as a response to sub-question 1 (on the degree of vertical integration) that they are working partly vertically integrated to the extent that two of their collaborators in infrastructure and development teams are internal (owned by them). The other partners are all external to the organisation.

In the BD case, the major stakeholder works with four internal teams in facilities and properties, security and ICT, so it works in a slightly vertically integrated configuration although it still needs to work with collaborators in the CN that work unbundled. Within the internal departments, the securities group is responsible for managing the welfare of customers, enforce compliance rules around when bags can go on the belts and when passengers need to have their passports checked.

The baggage integrator organisation respondent asserted that they worked on the delivery of the solution that is their part of work. It was also indicated that they performed their tasks as partners in the CN with the airline and a project management organisation. The airline was responsible for network and communications among other things. The project management organisation was responsible for the delivery of the project as per the project schedule and within budget.

6.3.5   Analysis of sub-question 5 data

5. *How do you compare it with vertical integration (similarities and differences or advantages/disadvantages)?* What are the advantages or disadvantages in having all or some of the partners owned by one company?

TAP: Going through the analysis of this respondent's response (TAP-A), there is an overwhelming opinion about the advantages of working in an unbundled way. He attempts to bring logic to this view from the perspective of organisations in expressing that it is cheaper to outsource to a skill set that is an expert. This outsourcing is in contrast to hiring or developing a skill set internally to run a fully integrated configuration. The following comment is presented from the raw data itself:

> " Let's give away the bits that we are not strong doing and that's why I think the Txt A Park has long legs in the industry for going forward."

HI: The respondent is categorical in expressing his views on disadvantages of working unbundled. The points put forth in support of his statement being:

- Hard to govern.

- Hard to understand the priorities and constraints.

- Uncertainties about the escalation path.

He further mentions about the sharing and working towards a strategic goal by organisation owned internal partners (or departments). The examples from experience, working with internal development and infrastructure teams were quoted as advantages of working vertically integrated.

SIM: According to the SIM case data, the respondent seemed to be more supportive of vertical integration as it helps in making quick decisions without having to wait for all members of the network to respond. This case asserts that businesses want quick response and delays in taking a critical decision is an obstacle.

BD: The respondent has highlighted an unexplored merit of semi distributed model or having both a degree of unbundling and vertical integration. The interpretation of semi distributed is a mix of both integration and unbundling

(to a degree). The merit lies in the effectiveness of human resource utilisation. The skilled human resources can be put to good use working for someone else if there isn't any useful project/assignment for them from BD-A (main stakeholder) and then have them recalled when required by the main stakeholder. The shuffling of resources helps in having another partner's business ticking along as well. A greater degree of unbundling where IP is the requirement compromises on the quality and is also a drain on the finances. To explain this, let's think that a fresher from the university is recruited for a project where the intellectual property is predominantly required. Recruitment of an unskilled resource will result in the investment of time and therefore cost to train the individual. This cost is borne by the main stakeholder with the resultant quality of deliverable also likely to suffer as a consequence of the action. The respondent stresses the fact that it could ideally be the best to work with full vertical integration but due to complexities and varied demands of the projects, would not be a sound idea in practice. It might topple the entire project and so quoting directly from the interview as below:

> *"Contracted and partnered model works for that goal because I treat it, my terminology is like a spot of sunshine. Over here you get some time in the sun and then the focus will move somewhere else."*

The response from the baggage integrator speaks of the advantages of working from both perspectives, working unbundled or with a larger degree of integration. The benefit of working integrated is that the organisation could protect its profit margin, and unbundling would mean working under financial constraints. Working integrated would also imply that full responsibility would be on that organisation. The explanation as above can be seen in the own words of the respondent as follows:

> *"If we've got the whole project, we have got to make sure that the whole project works. But again, I mean there are advantages, not being in one company. BD-A being responsible for the networks. It's the network infrastructure. They know what they are responsible for. They can look after it and they can make it happen lot quicker. So its horses for courses!!"*

Summary of analysis of sub-question 5 data   Summarising the cross-case analysis for sub-question 5, it can be observed that only in the case of

the TAP-A organisation, there is a strong argument for a high level of unbundling mainly due to economic reasons. Two of the cases, in HI and SIM, are more inclined towards working with a vertically integrated structure. The HI respondent supports his views about vertical integration, by quoting that it renders an easier and smoother project governance. Working with internal teams, which is analogous to working with a level of vertical integration, gives them the advantages of an ease of governance through a better understanding of the priorities and the constraints. The case also brings about the importance of a known escalation path and working towards strategic goals which are achievable by working in this manner. The SIM case highlights that the quickness in arriving at decisions is a significant advantage of working within a vertical integration structure. Both of the respondents in the BD case observe the pros and cons of working with vertical configuration and unbundling. The main stakeholder commented that the choice between the two modes of working depends on the requirements of the project. For most of the projects, it is a combination of both unbundling and integration. Vertical configuration works better for projects that need to use IP, whereas unbundling works better for more generic type of jobs. The other respondent, in this case, refers to working with financial constraints being an issue with working in an unbundled way, with the advantage being less responsibility to bear, in a project.

6.3.6 Analysis of sub-question 6 data

6. *How do you think an agile business model for a collaborative network of organisations creates defence against unpredictable market conditions?* How does the agile business model protect from unpredictable market conditions?

TAP: The respondent observes that the ease and speed of deployment of the mobile payment solution platform, through cloud hosting, is the guard against unpredictable markets. He speaks of his organisation having the ability to deploy in any other country say, China within a week, which will be an entirely new business. The parking vendor comments about the ways to create defence against unpredictable market conditions as below:

> *"By being flexible and have pooled knowledgeable resource to provide reactive solutions to meet market conditions."*

HI: The response to this sub-question has already been provided as a CSF (section 5.2) on handling backlogs efficiently by working in small teams. That has been the main reason quoted by this respondent about how their agile methodologies and business model protect the business from an unpredictable market. Here the primary data in response to the present sub-question, details the relative advantages of using smaller teams over a single large team when it describes how the core team of 20 was broken into three teams to handle multiple projects at the same time. It allows those teams to release the project at different times, so one of the teams could be made available fairly soon if there is a change in requirements or market conditions to attend to this change. As an excellent example of what has just been explained, the partnership of the HI primary stakeholder with another organisation in the retail sector, for an insurance product has been discussed in the data.

Working in a number of small teams that adhere to an agile methodology, they could acquire the white labelled business from the retail sector organisation. The business could be acquired by re-prioritising and redistributing work between the three teams so that they could start working on the RFP first and then after acquiring the project, all the teams phased out their present work slowly, and switched over to working on the newly acquired work. Further, they phased the work as the deliverables became clearer.

SIM: The SIM case respondent, as the data suggests, observes that there is a built in flexibility in their revenue model that protects the service against unpredictable market situations. In his opinion, it is a sort of self adjusting model, which is agile. As a supporting statement, mention was made of budgets having been pre estimated and based on previous trends.

BD: The response in part has already appeared, spread over several CSF's in an earlier section (section 5.2). The following paragraph, however, serves as a proper response in the context. The response is that in the opinion of the major stakeholder respondent, this project acts as a perfect example of agility in the sense that one could enter the market sooner through an emphasis on MVP (or most valuable product) first. Being able to enter the market quickly, allows them to counter a volatile or unpredictable market. In respondent's own words:

> *"This is a perfect example. We are agile having the ability to live*
> *a MVP (or most valuable product) first or in small chunks rather*

than big bang means you can be to the market sooner, and there are
a lot of methodologies around that but actually within our business
that's very true."

The respondent also mentions about the ability to turn on/off features in
their product according to the circumstances, helps in carrying out change
management and training more effectively. Here, the respondent refers to
a large number of airports (say 26 as per the data) undergoing the change
management process, simultaneously. He illustrates the training aspect saying
that since they are running four production environments for training, this
agility to turn on/off to different environments allows the people to catch up.
This ability ensures that none of the concerned airports, anywhere in the world,
miss their services. To ensure that no one misses the service, the changes are
carried out in phases during the day, depending upon the time zones that the
airports are situated.

Finally, this ability supports compliance process as exemplified here from the
direct comment from the interview:

"Not only that but also compliance to a degree as well. Some
markets like Australia don't allow mobile check in, whereas, in New
Zealand, UK, the USA will allow mobile check-in. So having the
ability to, our ability to turn the features on and off in different
markets is vital as well because may be they'll say tomorrow "we are
happy with that". It's just a flag for us to change and then all of a
sudden that functionality is available to the business. That is where
we add real value to the business."

The baggage integrator respondent, however, looks at the response from an
angle of resourcing level. He observes that to manage the unpredictable market
conditions, they review their resourcing level and take contractors on board
apart from their regular employees.

Summary of analysis of sub-question 6 data   Summarising the cross-
case analysis for sub-question 6, it can be observed that the TAP respondent
views the ease and speed of deployment, through hosting on a cloud platform
as the defence against unpredictable market conditions for them. The vendor

views that, providing reactive solutions to meet market conditions, help them protect the business against an unpredictable market condition.

The HI case reveals the importance of working in various small teams that follow the agile processes, which is the practice in that organisation, as being the key to defending the business against a volatile and an unpredictable market.

The SIM case observes that their revenue model built into the business, based on past trend, is robust enough to self adjust and respond to the unpredictable market conditions.

The BD case major stake holder observes the importance of using the ability to turn on/off features at the proper time, helps them carry out change management and training more efficiently. This feature also supports the adherence to compliance which was exemplified in the relevant passages. Also introducing changes through a most valuable product first approach, allow them to reach the market sooner.

In this BD case, the baggage integrator response is built upon assessing resource levels to include the right combination of regular employees along with external contractors to meet the fluctuations of the market.

6.3.7   Analysis of sub-question 7 data

7. *How in your view could a vertical integration affect the agility of the business model for the collaborative networks?* How does belonging to a single organisation affects the agility of the business model for a network of collaborators?

TAP: The respondent commented, as per the interview data, that the vertical integration structure of working for some of the organisations on this service could have adversely affected the agility. He seems to base his observation on the fact that the collective effort of unbundled network (interpreting as collaborative venture working in an unbundled manner) has been successfully working.

However the short response from the parking vendor seems to be in direct contrast to the above respondent, as below:

> *"Having too many organisations can adversely affect the agility"*

HI: This case respondent, as was observed earlier, is more inclined towards the vertical integration in achieving the agility of business model in the face of an unpredictable market condition. As was observed previously, working with a level of integration allows the major stakeholder to have visibility into their priorities and the backlogs. This organisation is now working towards the acquisition of another local business, which is commercially sensitive to them. As the acquisition is still in the process, they are unable to update some of their teams overseas. However they could still mention to the latter about a high profile acquisition in the process and that there would be more transparency after the process is over when the acquired organisation becomes their own. This is supported by the comments as follows:

> *"Certainly, owning any of the partners that we owned we have a lot more, and probably transparency is the word around how we share our information."*

He further mentions the demerit of working with external collaborators in observing that the former could never engage their partner (like the scanning solutions provider) in any discussions and share information because of the commercially sensitive nature of those information.

SIM: This respondent shows his leanings in favour of working in a vertically integrated structure for taking on the market uncertainties. He emphasises that a more vertically integrated structure results in better resource utilisation by allowing to plan as per functional specifications of the project, using the known capabilities of the resources. The other factors advanced are:

- Better transparency.

- Better control and monitoring.

- Commitment towards meeting organisational goals.

- Less economical and technical debt as only one organisation is involved.

BD: The BD case seem to be more open on a "distributed model" (according to the major stakeholder respondent's words) that adopts both of these working configurations, as per the requirements. He further sees the merits in both types of working structures: for working with CN partners in an unbundled manner as well those in collaboration with internal teams (integrated departments within) on a project. He views that working thus imparts more

efficiency to the project. To achieve this goal, the organisational SLAs play a major role, and they become instrumental in the development and the retaining of IP through the network partners. As the following comments show, it saves them time and money, which would otherwise be spent, in training fresh recruitment.

> *"The other factor is we do keep a bit of control on our business partners through our SLAs and through our partnership we do expect that we do have certain amount of people within that organisation that work for Air NZ and in some cases, we have dedicated named people who work for Air NZ. So yes they are paid by other companies, they work for other organisations, while they are not working for us, but they are the named people who are on our account. So that also help build that intellectual property so we don't have their people fresh out of the university"*

The other respondent, from the baggage integrator organisation, for this case, argues for a vertical integration configuration due to the existing communication channels in such a configuration. This way of working avoids the different dynamics of working with partners. He further views that in a single organisation structure, the boundaries of working are known, so there is less probability of a lack of communication on a matter.

Summary of analysis of sub-question 7 data   Summarising the cross-case analysis for the sub-question 7, it can be observed that the majority of respondents are more supportive towards the vertical integration approach. Only two out of a total of six respondents for the cases, the TAP-A (MPSP) organisation, and the airline organisation (BD-A) viewed a different opinion from the rest.

The TAP-A organisation was observed as being more vocal towards an unbundled way of working, while the airlines organisation views working with a combination of the two being ideally suited to their business and depends on requirements. He also observes that through putting proper SLAs in place for their partners in a CN, the organisation can support the development of IP as well as retain it. They can save time and cost on training resources by maintaining certain named resources on their account through SLAs within their partner organisations.

Both the HI and SIM cases mention about having more transparency and control in a vertically integrated way of working. Another factor which also seemed like a matching pattern between them was the motivation that such a working structure offers in the way of working towards achieving a common or strategic goal of the organisation. The SIM case also observes that resource utilisation can be done better if one works with internal teams. The parking vendor notes that too many organisations adversely affects the agility, though he does not go any further in his response.

The baggage integrator advances his views in support of working in a vertically integrated manner, as he feels that it makes it more convenient to work since the boundaries of working are known. He further describes that the teams, working in this manner, do not need to work with different dynamics associated with the various partners, which happens in an unbundled configuration.

Chapter 7

Discussion and Conclusion

7.1 Introduction

The present chapter is the final and conclusive chapter of this research study. This chapter details the summary of the findings for the main research questions 1 and 2, contribution of the thesis, and a discussion about the limitations. It previews the issues faced while carrying out the various phases of the research with emphasis on those faced during the data collection stage. The chapter concludes with a mention of the possibilities for future research that this study has opened up.

7.2 Summary of answers to the main research questions

In Chapter 3 on research methods and Chapter 5 on cross-case analysis, the two main research questions were presented which the research would set out to answer. This section has the summary of the answers to those two research questions. The detailed analysis of the sub-questions related to the main research questions Q1 and Q2 have already been covered in the Chapter 6.

7.2.1 Summary of answer to research question 1

The summary of the answer to the Q1 is described below, based upon the analysis as mentioned above and using qualitative research methodologies [10].

Q1 How to govern collaborative networks to achieve an optimal level of responsiveness for a given business model?

Answer: Effective communication emerged as a matching pattern in defining responsiveness in three of the four cases in HI, SIM and BD. The leftover case in TAP also implicitly suggested the need for effective communication for success in the CN venture. The quickness of response also emerged as a factor related to the Business Model responsiveness. Other factors that contribute to responsiveness are primarily the opinions of individual cases, as follows (the bracketed cases represent the primary data source for the factors):

- Account management and escalation path in partners (HI).

- Quality of experience (TAP).

- IT systems communicating to back end in real time (TAP).

- Quickness in response (SIM).

- Promptness in fault rectification (TAP).

- Outage SLAs (TAP).

- System up-time (TAP).

- Recorded and retrievable response to any issue as measurement of responsiveness (SIM).

- Speed of Completion of the Project (BD).

- Issue Tracking and Resolution (BD).

Satisfactory adherence to SLAs is another measure of responsiveness, as observed by two of the cases in TAP and BD (baggage integrator). From the HI case, no noticeable new knowledge emerged about measuring responsiveness. Two of the cases (TAP and SIM), observed that the services are being run at present as a sort of participatory governance, where all the collaborators have the freedom to participate in the governance. One of the cases (BD) brought out the decentralised type of governance for that project by the main stakeholder, in at least the procurement process. All but one case in HI detailed the process of bug and issue tracking as one of the challenges in governance. Other challenges encountered in daily governance are listed as below by individual cases:

- Compliance issues.

- Vendor Management.

- Transfer of knowledge on the resignation of an experienced person.

- Conflicting priorities around change management.

- Lack of visibility and control.

- Unfamiliarity with the new service.

These are the specific challenges encountered in project execution stage, as mentioned by one case:

- Long lead items.

- Project plan.

- Infrastructure and component list.

- Short time for project execution.

Two of the cases (TAP and SIM) considered a robust revenue structure as the basis for forming the business model. The parking vendor respondent in the TAP case mentioned that a need for an equipment upgrade was created in local customers. The necessity to create the need was a consideration during the set up stage of the business model. Sound account management practice, as well as the competence of people working in a collaborative network, were observed critical factors in project governance by two of the cases (HI and BD). The ability and foresight to use pre-existing facilities like sales and distributions channels, a customer base, communication channels and hardware and software resources, were mentioned as factors for consideration of a collaborative network business model by the SIM case. Providing a good customer experience, having the ability to serve more customers in the same footprint and some cost saving through the optimum use of manpower and time was also observed to be factors taken into consideration for setting the business model. To maintain business as usual, at each location of project execution, was noted as the prime consideration in the one case of BD where access areas are prioritised based on prior experience, to achieve the above. One case (TAP) uses cloud computing as deployment and delivery mechanism. Another case (HI) commented upon the importance of deployment and delivery in assessing where each functional component should live (on the websites), quoting the reference of a white

labelled product. In contrast, the third case in SIM mentioned about a delivery mechanism through courier to deliver physical SIM cards and use a sales and distribution network of representatives and retailers to market the product. As different mechanisms for delivery and deployment, the BD case mentioned about providing dual connectivity for redundancy at airports to run the service that needs fibre for networks. On-going software support for the BD case is provided remotely by the baggage integrator, with the hardware support provided through a service contract by another contractor.

7.2.2 Summary of answer to research question 2

The summary of the answer to the Q2 that this study has found, based on a qualitative approach and as analysed in detail, through the sub-questions in chapter 6, is as follows:

Q 2. How does the level of vertical integration vs. unbundling in organisations affect the agility of their business models?

Answer: As per the primary data available, it may be inferred that there is a smooth revenue stream running in conjunction with the service stream in the TAP case. These are the factors that have made this service maintain profitability and sustenance to the change in market demands. Consequently, they indicate benefits of an unbundled structure for this CN project towards achieving agility. This service has benefited from unbundling in the following ways:

- Quick Plugging in of cloud mechanism (for deployment and delivery of solution).

- Adaptability to change in requirements (or market demand) to be agile.

The back end of the solution does not need to change as it is sound and robust. So in future, if the Council wishes to go ahead with an app on the mobile phones for parking, then this transformation can be done quite easily.

The data collected from two of the cases in TAP and BD explicitly suggest that possession of specialised skills identifies a collaborator in a CN, which is largely unbundled, and agile. The SIM service and the HI cases agree that all the partners work on their assigned units of work to deliver the service/product in their respective

networks. From this, an inference can be drawn about the possession of necessary skills by the partners in an unbundled network, as contributing towards agility.

The data from all of the cases, directly or indirectly, suggest that an adaptability to change in requirements is critical to the success of a CN service or project.

In the health insurance case too, the collaborative network is working largely unbundled with each collaborator working on distinct units of work. We observe how each of the functional units are critical for the delivery of the end product/service. However, it follows from the data analysis that a level of vertical integration seems to be preferred in achieving the strategic objectives of the main stakeholder for the HI case. Working thus has the advantage of a central escalation point for the projects, besides having more visibility and control, both factors contributing to agility. If operational project management has a higher priority, then unbundling (outsourcing) a part of the work seem to be the agile approach.

The SIM services case also makes an assertion of the fact that all the partners are responsible for working unbundled. However, the inherent delays due to the requirement of everyone's agreement for critical project governance issues, seems to be a disadvantage of unbundling from an agility perspective.

The data analysis from this research also indicates that it requires many meetings to move forward a decision where all partners need to be present, which goes against quick decision making and is an obstacle to achieving agility. Being vertically integrated implies better resource management, visibility and control. The implication towards a better visibility and resource management hold true as the capabilities of the personnel are well known to the management within the same organisation.

The findings from the BD case highlighted the merit of a combination of vertical integration and unbundling. The merit lies in the effectiveness of human resource utilisation. This effectiveness of resource utilisation is achieved through carefully documented service level agreements (SLA) for the collaborators in the collaborative network. The SLA's assist in creating and maintaining IP (intellectual property) within the partners through retaining their personnel on the major stakeholder account for later employment. Where only IP is required in a project, it is more beneficial for a business to have a higher degree of vertical integration by employing the services of internal BA's which saves them time and cost on training and also retains airline specific IP. These factors support in achieving agility. On the other hand, if the job is a generic IT oriented e.g. related to the server, networks
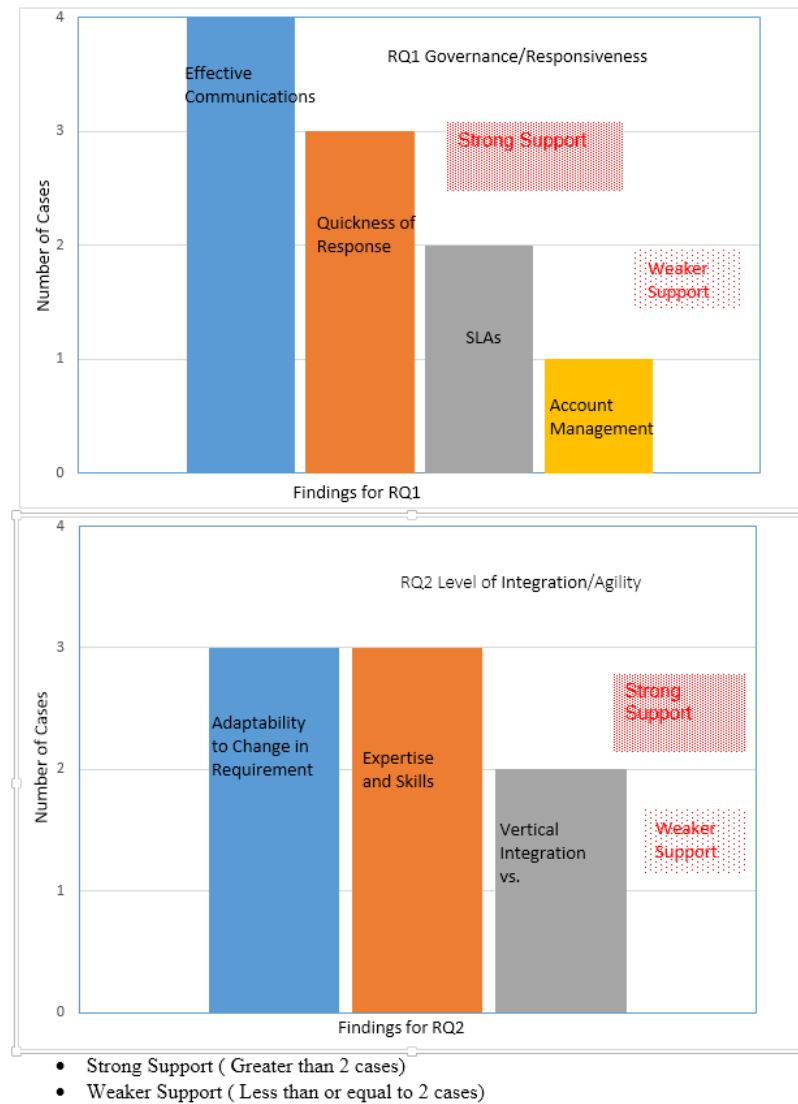
FIGURE 7.1: Graphical representation of Findings

and operating systems, then they find it a more appropriate measure to outsource (unbundle) that part of the project to CN partners.

The other important partner, the baggage integrator observes that there seems to be an advantage in a larger degree of vertical integration towards achieving better profit margins and financial gain if the organisation is skilled in several areas. The organisational skills help in working towards agility. A snapshot of the main findings for both the research questions RQ1 and RQ2 are shown diagrammatically in Figure 7.1.

7.3 Contribution of the Thesis

Recalling the section 3.1 where the following objectives were formulated:

- Identify different factors that are responsible for any organisational business model to be governed with an optimum level of responsiveness.

- To enable organisation to identify a suitable structure (degree of integration/unbundling) in a collaborative network business model, for their mode of governance, in order to achieve agility.

Also referring to the challenges for this research as per section 1.2

1. Ways to govern a CN to achieve an optimum level of responsiveness.

2. To achieve right combination of integration vs. unbundling for business model agility for an ICT service.

This thesis has added to the knowledge in the area as the discussions on the analysis of sub-questions of research questions Q1 and Q2 (Section 6.2.1 through 6.3.7) would indicate.

To summarise, the following are the salient points of contribution of the thesis:

1. It has stated that effective communication is an essential requirement for the success of a CN project.

2. The thesis has validated a commonly held notion that skills and expertise in a specialised area is an essential ingredient for success in a network.

3. The thesis brings out several factors that lead to achieving agility and responsiveness of business model for the participating organisations. Many of these factors are in conformity with earlier published work [1], thereby validating those.

4. The thesis has defined the factors responsible for achieving BM agility and an optimum level of responsiveness for a network of multiple (more than two) collaborators, from which the desired characteristics of an Agile and Responsive Business Model may be determined.

5. This work has advanced several propositions and opened up areas of future research as described in Section 7.5.

6. The work done has contributed to finding the constraints in the path of achieving agility and responsiveness.

7.4   Limitations of the thesis

The following are the limitations faced:

- Lack of interviews from some of the collaborators: This factor made conclusive inferences within cases practically impossible as other collaborators' perspectives remained unknown. The lack of data affects the process of drawing a balanced conclusion on an issue in a qualitative study.

- Limited publicly available data as a secondary source of information: This forced the source of data to be restricted to only the interviews, with the possibility of a biased judgement.

- Follow up emails were not answered: Certain difficult to understand, parts of the transcripts were left to the interpretation of the researcher, as there were no further explanations by the respondent.

- Time restricted the number of cases that could be included. More time at the disposal meant more cases and hence the availability of more data. The inclusion of more cases might have helped in avoiding the ambiguities or inconclusiveness in the analysis.

- The personal judgement of respondents as reflected in their responses may be influenced by their role in the organisations, e.g. a sales or marketing personnel may view the factor of integration versus unbundling from the perspective of business gains to his organisation.

7.5   Conclusion and future research

Based on this study on the working of the cases, a proposition may be advanced based on main question 1 on agility, that for some type of services, it seems that a higher degree of vertical integration is a better approach. For those services, if a cloud based deployment and delivery approach is the priority and the contribution of collaborators is diverse, then there is no option but to go for unbundling as a

solution. Additional research is recommended to find out exactly which types of ICT-enabled services benefit from a vertical integration as the preferred structure for a CN.

The second proposition is based on the findings from the main question 1 on responsiveness. It could be stated that services such as TAP provide collaborators with an advantage over others (like the HI case) in having a quantitative measure of responsiveness. Further research into metrics for responsiveness is recommended. In other words, research to focus on defining measurements that can be used to better manage the collaborative networks.

A third proposition that can be advanced is that a participatory, and largely decentralised model of project governance, is more effective in achieving an optimal level of responsiveness in a CN than a centralised model. This third proposition will require a larger set of case studies to confirm our findings about the preference for a decentralised model for collaborative networks.

This study has opened up various possibilities for further research; to quote an example, respondents from the health insurance case and the SIM service would like to have a higher degree of vertical integration for their services than others. This research has paved the way for investigation to questions like "What type of products or services could benefit from unbundling more than others?"

Appendix 1 Ethics Approval

28 October 2015

Jairo Gutierrez
Faculty of Design and Creative Technologies

Dear Jairo

Re Ethics Application: **15/347 Governing networks of collaborators for achieving business model agility for ICT enabled services in New Zealand.**

Thank you for providing evidence as requested, which satisfies the points raised by the Auckland University of Technology Ethics Committee (AUTEC).

Your ethics application has been approved for three years until 28 October 2018.

As part of the ethics approval process, you are required to submit the following to AUTEC:

- A brief annual progress report using form EA2, which is available online through http://www.aut.ac.nz/researchethics. When necessary this form may also be used to request an extension of the approval at least one month prior to its expiry on 28 October 2018;

- A brief report on the status of the project using form EA3, which is available online through http://www.aut.ac.nz/researchethics. This report is to be submitted either when the approval expires on 28 October 2018 or on completion of the project.

It is a condition of approval that AUTEC is notified of any adverse events or if the research does not commence. AUTEC approval needs to be sought for any alteration to the research, including any alteration of or addition to any documents that are provided to participants. You are responsible for ensuring that research undertaken under this approval occurs within the parameters outlined in the approved application.

AUTEC grants ethical approval only. If you require management approval from an institution or organisation for your research, then you will need to obtain this. If your research is undertaken within a jurisdiction outside New Zealand, you will need to make the arrangements necessary to meet the legal and ethical requirements that apply there.

To enable us to provide you with efficient service, please use the application number and study title in all correspondence with us. If you have any enquiries about this application, or anything else, please do contact us at ethics@aut.ac.nz.
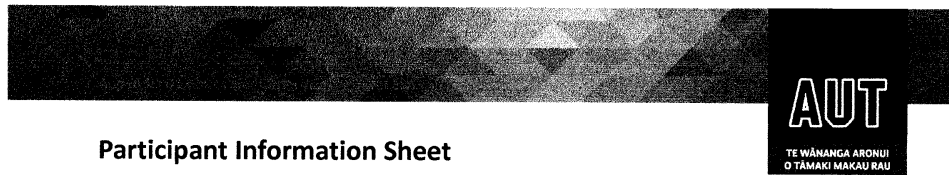
All the very best with your research,

Kate O'Connor
Executive Secretary
Auckland University of Technology Ethics Committee

Cc: Kaushik Chowdhury krchome1@xtra.co.nz; kchowdhu@aut.ac.nz

Appendix 2 Participation Information Sheet

Participant Information Sheet

Date Information Sheet Produced:

07 Sept 2015

Amended

11 Sept 2015

Project Title

Governing network of collaborators for achieving business model agility for ICT enabled services in New Zealand

An Invitation

Hi,

My name is Kaushik Roy Chowdhury and I am an MPhil student with the School of Computer and Mathematical Sciences. I am currently involved in a research titled "Governing network of collaborators for achieving business model agility for ICT enabled services in New Zealand" which will enable me to acquire an MPhil degree at AUT, which is a qualification at the post-graduate level. I cordially invite you to participate in this research and support me in my data collection.

Your participation is voluntary and you may withdraw at any time prior to the completion of data collection (31st March 2016). Please be aware that your interview will be recorded for transcription purposes purely for the authenticity and completeness of data collection purposes. If you do not want to participate or wish to withdraw later, you will neither have any advantage nor any disadvantage as a result of your decision.

What is the purpose of this research?

The purpose of this research is as follows:

The purpose of this research is to evaluate the governance structures of collaborative networks and formulate guidelines and set of recommendations towards achieving agility in their business models. This research is a multiple case study (4 cases) of IT governance structures and strategies for a collaborative network that uses an ICT enabled service such as Txt a Park scheme (of Auckland Council). It is aimed to study such factors as responsiveness of business model to changes in the environment. Business model agility factor will also be studied between two different types of networks. The case studies will be used to determine the impact of different governance structures on partner flexibility by cross case analysis.

The completion of this research is the requirement for acquiring an MPhil (Master's in Philosophy) degree at AUT University.

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How was I identified and why am I being invited to participate in this research?

I have initially shortlisted a few areas where collaborative networks exist for an ICT enabled services within Auckland. Your organisation was one of such ICT enabled services in a network therefore your manager was identified first through your organisational website (contact us section) by ringing the contact person. The contact person in your organisation redirected the call to the appropriate manager who was explained the research and asked for participation. Once he agreed to your organisation participating, he came up with your contact details. In the opinion of your Manager you are a key person to represent your organisation. Therefore you are being invited to participate in this research.

What will happen in this research?

I shall conduct a semi structured interview with a series of pre designed questions aiming to get the required information and data for the research. If it is more convenient to you an email interview can also be organised in lieu of face to face. You may please feel free to answer them in any order comfortable to you. You may also present your response as a story if that's a better option. The data I collect as a result of this interview will only be used for the purposes for which it has been collected.

What are the discomforts and risks?

There are no discomforts and risks in the process.

Your identity will be kept strictly confidential to others within and outside your organisation and your privacy will be maintained throughout.

How will these discomforts and risks be alleviated?

Not applicable as per explanation above.

What are the benefits?

The research will assist me in obtaining a post graduate (MPhil) qualification. Other beneficiaries are the participants who will gain an insight into relevant elements of an effective ICT governance strategy within a collaborative network (of more than 2 organisations) as they'll receive a summary of the findings of this research. The little understood factor of level of vertical integration vs unbundling in collaborative networks will be investigated and analysed that will bring out the right mix of the two for making a business model agile. All collaborative network organisations stand to benefit by this research as it will answer two of the biggest challenges in faced in the governance of such an ICT enabled service. There will be academic publications in journals and/or conference proceedings that'll lend credence to the findings of this research.

This research will also augment to the body of the knowledge in this scantily researched area.

How will my privacy be protected?

There will be no issues in protecting your privacy as your identity will not be disclosed to other people in your organisation neither will it be published in the research thesis.

What are the costs of participating in this research?

Cost is only in terms of time which at the maximum will be 1-1.5 hrs of your time (including any follow up email/interview). In fact it is more likely that the time taken may be as little as 30-45 minutes for each interview.

What opportunity do I have to consider this invitation?

You may take up to a week to respond.

How do I agree to participate in this research?

Please let me know of your willingness to participate and I shall send you a consent form. Please fill it in and give it back to me with your signature.

Will I receive feedback on the results of this research?

Yes, you will be given due feedback in a summary report of this research's findings.

What do I do if I have concerns about this research?

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor,

Name: Jairo Gutierrez

Email: jairo.gutierrez@aut.ac.nz

Work Phone: +64-9-921 9999 Ext. 5854

Concerns regarding the conduct of the research should be notified to the Executive Secretary of AUTEC, Kate O'Connor, ethics@aut.ac.nz , 921 9999 ext 6038.

Whom do I contact for further information about this research?

Researcher Contact Details:

Name: Kaushik Roy Chowdhury

Email: kchowdhu@aut.ac.nz

Mobile Phone: +64-210761038

Project Supervisor Contact Details:

Name: Jairo Gutierrez

Email: jairo.gutierrez@aut.ac.nz

Work Phone: +64-9-921 9999 Ext. 5854

Appendix 3 Consent Form

Consent Form

For use when interviews are involved.

Project title: Governing network of collaborators for achieving business model agility for ICT enabled services in New Zealand

Project Supervisor: **Jairo Gutierrez**

Researcher: **Kaushik Roy Chowdhury**

O   I have read and understood the information provided about this research project in the Information Sheet dated 07 Sept 2015.

O   I have had an opportunity to ask questions and to have them answered.

O   I understand that notes will be taken during the interviews and that they will also be audio-taped and transcribed.

O   I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.

O   If I withdraw, I understand that all relevant information including tapes and transcripts, or parts thereof, will be destroyed.

O   I agree to take part in this research.

O   I wish to receive a copy of the report from the research (please tick one): YesO NoO

Participant's signature: ....

Participant's name: ....

Participant's Contact Details (if appropriate):

....

....

....

....

Date:

Approved by the Auckland University of Technology Ethics Committee on   *AUTEC Reference number*

28 October 2015   **15/347**

Note: The Participant should retain a copy of this form.

Appendix 4 Code Details

Code Legend

1. Ease of Use

2. Efficiency

3. Usability

4. Flexibility

5. QOE

6. Availability

7. Usage Measurement

8. SLA (Not Availability)

9. Functionality

10. Change Management

11. Communication

12. Operation Management

13. Complexity

14. Creativity

15. Capability

16. Feasibility

17. Competitiveness

18. Superiority

19. Compliance

20. Profitability

21. Market Unpredictability

22. Outsourcing

23. Visibility and Control

24. Intellectual Property

25. Strategic Goals

Code Definitions:

1. Ease of Use: Ease with which a software/service/product could be used/handled by the customers/users. If anything (service/product/machinery/software) could be used/operated naturally (without external aid), then it has a high degree of ease of use. This also refers to the degree of user friendliness of a software interface.

2. Efficiency: With regards to timely meeting of deadlines, any action that was completed/accomplished quickly (with minimum expenditure of time and effort). The service/product being fit for purpose and that purpose can be carried out well. In the context of this research it includes efficient to use (takes less time in accomplishing a task).

3. Usability: The capability of usage of a software/service/product or system which takes into consideration its usefulness.

4. Flexibility: In regards to the ability of an action/operation to be easily modified. In general it gives an insight into the level of adaptability of that action with respect to its environment or context.

5. Quality of Experience: It has been used as a measure of customer experiences with a product/service (e.g. Txt A Park, Airport self-check baggage handling/bag drop etc.). It is supposed to be as a result of fulfilment of his expectations with respect to the product/service or enjoyment that it has provided to its user in the perspective of his personality. Also more satisfying to use.

6. Availability: A quantitative measure of the degree of being available (for a service/product) for end user's usage. It has also been used as qualitative measure at times.

7. Usage Measurement: Some sort of measure for use (how often and for how long) of a service/product.

8. SLA (Not Availability): Service level agreement (with availability – covered under separate code). In the context of a collaborative network (CN), it is a contract between a partner in the CN and the end user (which is generally the main stakeholder) that defines the level of service expected from the service provider.

9. Functionality: A range of operations of the software/interface/product or the systems in use in the collaborative network cases.

10. Change management: All operations, functions and actions towards implementing and managing changes (including adding extra functionalities in a software/web application or an upgrade in service offering), for example an upgrade for the airports for self-assisted bag drop and baggage handling.

11. Communications: Everything (including tools to communicate: like email, fax, meetings) related to external (among collaborators in a network) and internal (within an organisation) communication towards the advancement of a project for meeting deadlines and schedules.

12. Operations Management: All action and measures geared towards the day to day management of the operations of a collaborative network.

13. Complexity: A measure of the degree of being complicated in nature. The less the degree of complexity, it implies simplicity

14. Creativity: To be creative or thinking out of the box towards meeting customer expectations from the collaborative partners.

15. Capability: Measure of competency for an organisation in a collaborative network towards its contribution to the main objective of the project.

16. Feasibility: Degree of achievability or viability of a product or service. Use broadly for planning the business model of an organisation.

17. Competitiveness: A state of being competitive (as good as or better than others of a comparable nature) in the present day market for a business.

18. Superiority: Dominance of products/service offered by a partner over its competitors.

19. Compliance: Adherence to rules of the land (for an organisation for introducing its services in the market (external or internal)

20. Profitability: Any action, measure, decision or planning geared towards achieving profit. It also includes any revenue generating action by the collaborative partner.

21. Market Unpredictability: Uncertainties that can't be predicted with reference to market (for a product/service) with any degree of accuracy.

22. Outsourcing: Any service/work that is assigned to a collaborative partner by another partner who is either not expert in that field or feels it more economically viable to do so.

23. Visibility and Control: With respect to a project/assignment/work for which it is a capability of being readily observable and control (over it)

24. Intellectual Property: Relates to the artifacts, skills, designs etc., created from the intellect of individuals and in possession of an organisation, in short creation of intellect.

25. Strategic goals: Critical documented objectives of an organisation.

References

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