VICTORIA UNIVERSITY OF WELLINGTON

Te Whare Wananga o te Upoko o te Ika a Maui

Implementing a Managed Print Solution for Tainui NZ Ltd

A Case Study presented to the

School of Information Management

Victoria University of Wellington

in partial fulfillment of the requirements for the degree of

Master of Information Management

by

Liang Cao

18th Oct 2013

Declaration

1. I know that plagiarism is wrong. Plagiarism is to use another's work and pretend that it is one's own.

2. I have used the APA convention for citation and referencing. Each contribution to, and quotation in, this ***Case Study*** entitled ***Implementing a Managed Print Solution for Tainui NZ Ltd*** from the work(s) of other people has been attributed, and has been cited and referenced.

3. This paper is my own work.

4. I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work

5. I acknowledge that copying someone else's assignment, essay or paper, or part of it, is wrong, and declare that this is my own work.

Signature(s) Liang Cao Date 18/10 /2013

Liang Cao

Table of Contents

Abstract

Purpose – The purpose of this paper is to describe the failure of implementing a managed print solution to control costs and reduce waste associated with outsourcing practices in a complex and legacy environment.

Design/methodology/approach – Project documentation and literature reviews versus interview results by key stakeholders of the project.

Findings – It is found that there are critical successful factors would directly affect the result of a project implementation. Multi-party collaboration is quite challenging to each party, especially the product owner. It needs a strong leader to indicate each party's responsibility and make sure communication can go through smoothly.

Practical implications – Organizations who have more complex infrastructure and legacy systems would need to take extra care when integrating new systems.

Originality/value – This paper can be used by Tainui or other organization leaders and project managers to be more effectively achieve future project success.

Keywords Print management, Printers, Waste, Cost saving, IT project, CSF, Multi-party collaboration, Outsourcing

Paper type Case study

Chapter 1 : Introduction

Tainui New Zealand Limited ("Tainui") has experienced long running issues with the provision of an effective print service to its users. The key challenges faced within the Tainui print environment are an ageing printer fleet and a poor user experience. This on-going issue with print and the increasing costs associated with support of the service had led to the initiation of a project with the intent to deliver an enhanced user print experience, on-going reduction in the operational costs of printing itself (expected to reduce the current operating costs from $828k to $438k); it would align with Tainui's print strategy, and scope for future development.

Paua New Zealand Limited ("Paua") had been appointed as preferred supplier for the provision of a managed print solution ("MPS"). The initial objectives of this project were set as: a) to provide an enhanced user print service b) To implement cost management reporting to drive effective and informed decision making, and to increase the transparency and capacity of Tainui to manage the various costs

associated with printing across business units c) to successfully implement the Managed Print Solution within a budget of $250k by December 2012.

Eventually, the project was rolled out at the end of 2012, but none of the above objectives was achieved. This paper is written to investigate the failure, analyse and review the project, and find out the key issues that caused the failure. Due to the importance of the project, recommendations will be given to Tainui to review and improve the Managed Print Project and re-examine other projects to prevent any similar failure happening in the future.

In order to identify the key issues, company project documentation reviews will be carried out to understand the project's definition, scope, plan, and implementation etc. Scholarly literature review will indicate other studies that are closely related to this paper, to provide a framework for establishing the importance of this case study. Semi-structured interviews with interview questions generated from early literature reviews (project and theory based) will be carried out.

Conclusions and recommendations will summarize the findings and draw inferences. The findings from this case study can be used by Tainui or other organization leaders and project managers to more effectively achieve project success.

Chapter 2 : Background

Tainui has experienced long running issues with the provision of an effective print service to its users. The previous printers comprised a mix of Lexmark and HP devices, this is an aging fleet with an average age of 5 years. The age of the hardware has resulted in performance issues and increasingly frequent outages. The previous support model and Service level agreements (SLA) did not reflect the importance of the service to our business and are misaligned with user expectations and business requirements. The levels of frustration amongst staff that rely on print capability are unreasonably high. Further, the previous costs to support the print service are considerable, including: hardware repair/replacement; consumables; and helpdesk/support time.

The ongoing issues with print and the increasing costs associated with support of the service have led to the initiation of the project with the intent to deliver an enhanced user print experience. This initiative presents an opportunity to consolidate the fleet and ensure that the hardware and support provided across the Tainui environment are fit for purpose, reliable, and meet the needs of Tainui users. Additionally Tainui expect to deliver a significant reduction in costs, increase staff compliance and contribute toward Tainui's environmental sustainability goals.

The key drivers to implement the MPS project were:

- To enhance the user print experience
- To reduce operational costs - cost of printing, consumables and support costs
- To Provide improved transparency with a simple price per page cost model and present options to the Tainui business to track and manage print related costs
- To remove the financial impact of hardware refreshes
- To better align the print service with Tainui's sustainability objectives

The request for proposal (RFP) was responded by five vendors. A key stakeholder team was assembled for the evaluation process among those five vendors. Paua and ABCD emerged as clear front runners and were shortlisted accordingly for the next selection phase.

Final presentations were hosted at the respective vendors' offices and gave the opportunity for Tainui stakeholders to review the hardware and interface options presented by each vendor and directly query their proposed solution. In the final review, Paua emerged as the preferred vendor to deliver the following detailed solutions:

Full print fleet refresh	Paua Multi-Functional Printer (MFP) / Single-Functional Printer (SFP) Print Devices

Equistar Office* (*Equistar is a third party application provider to Paua)	Secure Printing Follow-You Printing (at 9 sites) Authenticated Access at MFP (at 9 sites) Copy, Scan and Fax tracking (at 9 sites) Enterprise wide print tracking Delegated Printing Detailed reporting and auditing Centrally administered "Scan to Email"
Paua @Remote	Automated toner ordering Automated meter readings Automated "serious fault" logging
Paua Web SmartDeviceMonitor	Print fleet alerting and monitoring Batch configuration of MFP / SFP

2.1 Printing Cost comparison

The costs detailed below were previously split between Infrastructure, Procurement and Business cost centres. This represented the costs of printing for the period May 2011 to April 2012.

Expense type	Monthly cost	Annual cost
EUC support – Skynet*	$ 3,092.05	$ 37,104.60
IMAC's – Skynet	$ 446.89	$ 5,362.68
Fuser kits - Skynet	$ 2,522.58	$ 30,270.90
Maintenance kits - Skynet	$ 2,469.68	$ 29,636.21
Toner - Skynet	$ 46,496.24	$ 557,954.93
Transport charges - Skynet	$ 1,932.19	$ 23,186.28
Depreciation	$ 7,430.14	$ 96,591.98
Printer refresh FY11 - Skynet	$ -	$ 8,063.72
Administration printer contract	$ 3,393.70	$ 40,724.40
	$ 67,783.47	$ 828,895.7

**Skynet is an outsourced IT infrastructure provider to Tainui. They had this business partnership since a long time ago. Tainui's day to day operations, networking and project infrastructure resources are all sourced from Skynet.*

2.2 Paua proposed cost model

The Paua costs detailed below are based purely on a price per page model and the volumes are based on Tainui's current print output volumes. These costs are inclusive of all consumables, hardware, software, support, IMAC's, spares and services provided by the vendor

Paua	Per page cost	Current monthly page count	Monthly Cost
Colour	0.08	98,000	$7,840.00
Black and White	0.022	1,242,340	$27,331.48
Admin printers	0.08/0.022	11,000/21,000	$1,342.00
	Monthly Total	1,373,340	$36,513.48
	Annual Total	16,480,080	$438,161.76

Based on previous volumes the shift to a Managed Print Solution with Paua was expected to deliver an operational cost saving to Tainui of $390K per annum.

On the 31st of December, 2012, this amazing project formally rolled out to Tainui's varied sites, after its completion of technical, functional and user acceptance testing, creation of a revised service/support model, and print queue rationalization and updates. This formal roll out was also after the successful implementation of three testing pilot sites in Christchurch, Wellington and Auckland.

At the beginning, everyone seemed very excited to this new implemented managed printing system. You can see all the ageing printer fleet had now been replaced with

the brand new Paua branded multi functional printers. You can see people using their swipe card to grab their prints from different printers curiously; you can hear people talking about the new way of printing and scanning wonderingly.

All of the satisfactions and excitements did not last for long. Less than a month after the printer project rolled out, most of the printing jobs were starting to fall over. When people swipe their security card to ready to get their prints from the printers, the panel display showed them empty job in the print queue. Busienss interruptions, more and more complaints from the end users – Tainui's employees, finally led to the Paua printer project roll back from the highly expected managed print solution to the previous standard print solution.

Chapter 3 : Literature Review

In the past two decades, investment in information technology related projects increased significantly in organizations, however the rates of failure were quite high (Rubinstein, 2007). There were a few management literatures that have attempted to provide assistance in addressing this important issue (Finch, 2003; Jiang et al. 1996).

In order to understand what implementing a successful system should look like, this paper firstly reviewed literatures relating to critical success factors (CSF) of system implementation.

3.1 Critical Successful Factors

Critical Successful Factors (CSFs) are defined as the important things that must be done correctly for a project to be successful (Belassi and Tukel, 1996; Maylor, Vidgen and Carver, 2008; Rockart, 1979; Daniel, 1961; Lawrence, 2007).

Ten CSFs were specified by Slevin and Pinto (1986) (as cited in Pinto and Prescott, 1988) which still applies to most of the recent project implementations.

- *Project Mission - A clear sense of direction with clear initial goals*
- *Top management support - A willingness and ability to provide resources, authority and influence*

- *Project schedule/plan - A detailed specification and schedule for project implementation*
- *Client Consultation - Adequate communication, consultation, and active listening to and with the client*
- *Personnel - Necessary personnel were selected, recruited and trained*
- *Technical tasks - Required technologies and expertise were available*
- *Client acceptance - Final project was sold to the end users*
- *Monitoring and feedback - Provision of comprehensive information at each implementation stage*
- *Communication - An appropriate network for all necessary information to circulate among all key players*
- *Troubleshooting - An ability to handle unexpected crises and plan deviations.* (p. 3)

Apart from the CSFs, different organizations/projects define the time frame of success differently. It can be measured at project completion, within three months after project completion or even one to two years after project completion (Shenharet et al., 2001).

Daniel (1961) asserted that CSFs can be used by managers to successfully manage the organization and to enable creation of an information system to support management's efforts to improve organizational performance.

Lawrence (2007) identified the importance of project objectives on project success. User satisfaction can be other important criteria for judging system success (Finch, 2003). Successful implementation of the project concept is a matter of perception (Baker et al., 1988).

An Information system project implementation is only to be considered a success when the project is completed on time, completed within budget and completed according to its specifications (DeLone and McLean, 1992). Finch (2003) and Olson (2004) have also defined the success as the "achievement of planning, budgetary and functional goals" as cited in Rosacker and Olson (2008). (p. 62)

In 1986, Slevin and Pinto proposed the project implementation profile (PIP), which is a framework to help project implementation process, also helps project managers to diagnostic if required. PIP frame can be used as a project review, the lessons learned can also help as part of future projects (Finch, 2003).

More specifically, the following literatures relating to information protection, reducing waste, saving cost and enabling networks as advantages of implementing a network managed print solution. There are also literatures relating to outsourcing issues, multi-party collaboration, lack of testing and information management as concerns of a project implementation.

Kelley, Regan and Hunt (2004) described that implementing a network print management system could prevent increase users' access to printers, to improve the quality of print services, to decrease printing costs and environmental impacts, as well as to reduce the effort of technology staff to maintain the printers.

3.2 Information Protection

One of the purposes of introducing a Managed Printing Solution is to prevent information leakage issue. Kai and Uehara (2011) stated that information leakage is one of the most serious issues facing a company or an organization. Most leakage incidents happen in the form of documents. This fact has also been proved by a report from NPO Japan Network Security Association (as cited in Kai and Uehara 2011). They announced that 72.6% of information leakages were found to be via paper medium.

3.3 Reducing Print Waste and Saving Cost

Another reason to introduce the Managed Printing Solution is to reduce printing waste and save overhead of the company. There are a quite lot of literatures regarding the same purpose of implementing a new printing system.

Kelley, Regan and Hunt (2004) stated that one of their objectives to introduce a new printing system was to decrease printing costs. After introducing the new printing system, they observed the actual print volume has proved to be significantly less than before.

Dempsey and Palilonis (2012) found that new printing practices controlled costs and reduce wastes. “We believe we have made a significant impact on reducing a primary area of waste in the library by taking advantage of print management technology and educating our users. Instead of just reusing and recycling, print management has helped us REDUCE”. (p. 1)

By looking at the trends of printing management development, Taylor and Welch (1992) found that out of 73 libraries, only 7 were charging for prints, 37 were considering to charge, 11 more were discussing. 10 years later, another report from Ashmore and Morris (2002) revealed that half of the respondents have already started to collect printing costs, another 25% of the people being considered. This fact has also been established by Calloway (2003).

The Chronicle of Higher Education (2002) suggested that to create printing rules and limits would be an effective way to cut costs associated with printing. Educating people who would use the printer to print is quite important too. Park (1997) stated that users may not intend to waste from prints. They just do not realize how much they printed and how they could reduce waste.

3.4 Network-enabled Printing Management

According to Daniel (1998, p. 1), “Inkjets, lasers, multifunction printers and digital copiers are all becoming network-enabled. Device management and protocol support are now just as important as more traditional concerns such as cost, resolution and speed. Finding a centralized network management package that will incorporate the multi-function devices is the key.”

A network-enable printing system will be directly monitored by the supplier through the internet protocol. Real-time maintenance can be carried out even before the end user realised it. This approach prevents interruption by machine break down or inefficient maintenance. This has been mentioned by Kelley, Regan and Hunt (2004).

Kelley, Regan and Hunt (2004) discovered that their end users were really relying on the 'access card'[1] when they collect their prints, which means no access card no collections.

As described in the earlier section, Tainui had earmarked Paua and Skynet as two main external business partners to engage with the printer project. In other words, this project was outsourced from Paua to collaborate with Skynet.

3.5 Outsourcing Issues

"The main reason behind outsourcing is the need to reduce and control IT operating costs" (Ang and Cummings 1997; Ang and Straub 1998; Casale 2001; Loh and Venkatraman 1992a, 1992b; Slaughter and Ang 1996), "at the same to improve management focus and access technical talent not available in house" (Casale 2001; Lacity and Willcocks 1998) as cited in Levina and Ross (2003). (p. 332)

According to Winkleman et al. (1993) and Huff (1991) Outsourcing is no longer a new concept. There are always dilemmas to decide whether to out-source or in-source a project. "The make-or-buy decision is a classic management issue" according to Fill and Visser (2000, p.1). Either decision will have its own advantage and disadvantages, but it will really depend on the organization's needs and whether outsourcing suits their business strategy.

Outsourcing can be interpreted as "subcontracting custom-made articles and constructions, such as components, subassemblies, final products, adaptations and/ or services to another company" according to Hiemstra and Tilburg (1993, p.64). They also classified outsourcing to two forms, capacity outsourcing and non-capacity outsourcing. Capacity outsourcing is facility temporary insufficient, but non-capacity outsourcing which the organization is no longer to purse the activity.

The market force and technical considerations are listed by Gupta and Gupta (1992) as two drivers of outsourcing. A year later, Winkleman et al. (1993) added another

[1] The security card which has a chip in it, it stores users identification details and can be used to access particular facilities which recognise the card

two drivers, cost reduction and strategic shift with four motives of outsourcing, there are costs, capital, knowledge and Capacity.

Beulen et al. (1994) (as cited in Fill and Visser, 2000, p. 5) also concluded five main drivers for outsourcing: quality, cost, finance, core-business and cooperation. The interpretation for each driver has been developed in Table 1 below.

Table I
Drivers for outsourcing

Quality	Actual capacity is temporarily insufficient to comply with demand. The quality motive can be subdivided into three aspects: increased quality demands, shortage of qualified personnel, outsourcing as a transition period
Cost	Outsourcing is a possible solution to control increasing costs and is compatible with a cost leadership strategy. By controlling and decreasing costs a company can increase its competitive position.
Finance	A company has a limited investment budget. The funds must be used for investments in core business activities, which are long-term decisions
Core-business	Core-business is a primary activity with which an organisation generates revenues. To concentrate on core-business activities is a strategic decision. All subsequent activities are mainly supportive and should be outsourced
Cooperation	Cooperation between companies can lead to conflict. In order to avoid such conflict those activities that are produced by both organisations should be subject to total outsourcing.

Source: Beulen *et al.*, 1994

Make or buy decision making as a critical important aspect which has been mentioned by Stock and Tatikonda (2000) and McIvor (2005). Successful outsourcing will allow an organization to focus more to its other capabilities, but from another hand it might save a lot of money by doing it themselves. If using external organization is cheaper than doing something yourself, then it is a clear case for outsourcing (Hendry, 1995).

Gibler and Black (2004) stated that misunderstanding client's objective, policy and culture could be the most significant obstacles to outsourcing.

Successful planning partnerships in the outsourcing process is quite important; Kavcic and Tavcar (2008) stated that outsourcing can bring benefits and financial gains in short-term. At the same time, it might lead to poor quality and difficulties in the long

term if inappropriate partnerships are selected. This fact has also been mentioned by Kelley, Regan and Hunt (2004).

Rothery and Robertson (1995) stated that outsourcing needs a strategic dimension, as organizations trying to find the right size, in order to adapt to the new environment. Williamson (1979) proposed that monitoring supplier's behaviour could result in high coordination costs. The coordination costs include settling up contracts, paying bills, solving disputes etc.

As mentioned by Simon (1997) (as cited in Kavcic and Tavcar, 2000), "employees that make the decisions (e.g. supply chain managers, purchasing managers, and material managers) are human, and human decision making is "bounded" in its ability to acquire and process information; it is human to use simplifying heuristics to deal with the complex problems."

Cui and He (2009) asserted that the most important initial step in an outsourcing project is to verify the competence of the outsourcing partner. Although, outsourcing is a good idea, but maintaining a minimal level of in-house competency is highly suggested if the organization is to effectively apply the ideas from the outsourcer.

Outsourcing does not guaranty you will always get what you expected. Lacity and Willcocks (1998) found that only 54 percent outsourcing involved project achieved expected cost savings. In addition, Caldwell (2002a, 2002b) found that approximately one in every three outsourcing contracts failed to meet their expectations. There are also evidences showing that companies are cancelling their contracts and rebuilding their own internal IS capabilities (Buxbaum 2002; McDougall 2002)

3.6 Multi-party collaboration

From Lai's study (2005), the author defined that "Business process multi-outsourcing causes business collaboration, semantics of multi-party business collaboration has been recognized as a major problem for a long time, but relatively little fundamental re-search has been devoted it" (p. 2). The study also stated that any system which involving multi-party business collaboration would be a more complex system.

Cui and He (2009, p. 56) summarized the success drivers for technologies across innovation outsourcing which they took Universities technology innovation as an example (as shown in Table 2).

Table 2

Success Drivers Across Sources	Sources	Source-specific Success Drivers
• Trust and communication	*Universities*	• Detailed process control
• Strong partner competence		• Actively ensuring knowledge transfer (company to university)
• Strong in-house competence (all but start-ups)	*Customers*	• Expectation management
• Clear problem definition (all but start-ups)		• Organizational stability
• Incentive alignment (all but suppliers)	*Suppliers*	• Detailed process control
		• Clear milestones
		• Actively ensuring knowledge transfer (from supplier to company)
		• IP protection
	Competitors	• IP protection
		• Incentive alignment (all but suppliers)
	Start-ups	• Flexible decision making
		• Active participation in management
		• Organizational stability, dependence on key individuals

In order to collaborate with a business partner more effectively, it needs high degree of mutual understanding and trust (Cui and He, 2009). Although business partners' collaboration could produce higher innovative outcomes, but at the same time, unexpected conflicts between multi parties emerged too (Guinan et al. 1998; Polzer et al. 2002).

"Yet hands-on involvement of diverse stakeholders in design activities does not always lead to effective collaboration and instead may lead to more conflicts" (as Cited in Lavina 2005, p. 110)

Hardy et al. (2005) described an important factor to establish effective collaboration in between multi-parties is to coordinate efforts across organizational boundaries. In addition to this, Clegg et al (2004) added that business partners would say what product owners want to hear, thus leave the collaborative process away when the product owner exercise excessive control.

One of the features involved in multi-party business collaboration would be parallel performance; the order of interactions is no longer sequential. Because of this feature, it increases the difficulty to find responsibilities of each party for unsatisfied or mis-performed activities. (Lai, 2007)

From Lai's (2007) perspective, the author listed three key aspects which would be useful for modelling multi-party business collaboration (p. 7):

- ✓ *In terms of its structure, which are the parties involved and how are they inter-connected.*
- ✓ *In terms of the commitments associated with those parties, which responsibility do they commit to each other and which roles may the parties play within a commitment.*
- ✓ *In terms of its processes, what actions are performed by which parties after which properties are satisfied according to per- defined rules and which output can be expected, etc*.

In addition to the aspects above, Hanisch and Corbitt (2007, p. 11) described that "effective and appropriate communications have been argued to be key to successful software development projects".

3.7 Lack of Testing

Matsumura, Monden, et al, (2008) emphasised that the earlier defects were discovered in the system development, the cheaper they were to fix.

According to Ahmad et al (2010, p. 2) "Software reliability is defined as the probability of failure-free operation of a computer program for a specified time in a specified environment and is a key factor in software development process." Where hardware and software are both provided by the external supplier, extra attention to software reliability becomes very important.

According to Cardinali (1998), the cost of information system failure can be categorized as "immediate lost productivity, immediate lost sales, emergency service cost, cost of restoring data and long-term lost sales". (p. 3)

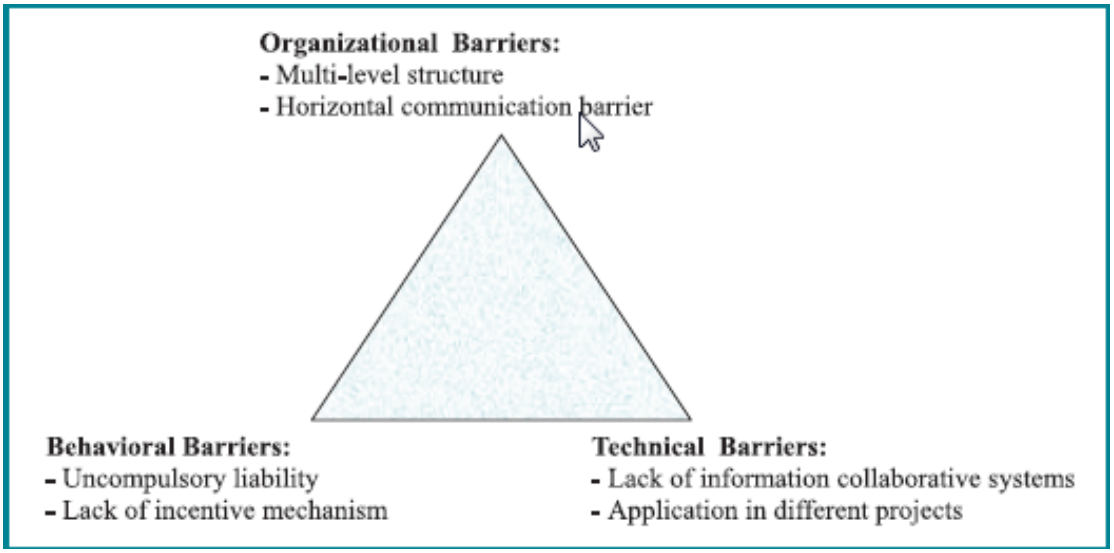
3.8 Information Management

Cipriano (1995) mentioned that Information Management is a key to the success of implementation of an IS project, through its planning, developing, testing and releasing.

Jehiel (1999) stated that more uncertainty and equivocality of information more complexity of research on information flow. In addition to this, Loosemore (1998) also found that multi-party involved organization structure present more difficulties in information transfer and feedback.

Zeng et al (2007, p. 8) provided a very useful model (Table 3) to determine information barriers in business process, in order to improve effective information flow in quality improvements.

Table 3



A successful project implementation needs to ensure compliance with the standard critical successful factors, with good decision making from the beginning throughout the whole project. Although outsource is a good choice for projects/organizations sometimes, but making sure it suits with the specific requirements, knowing what services or facilities the organization wish to be outsourced and in what way, is it going to be fully outsourced or partially? And how to monitor the service the outsourcer supplied? More specifically, for a large project of Information System implementation, quality assurance – Testing is a quite important phase before the project goes live.

Again, the purpose of introducing this Managed Printing System is to provide Tainui enhanced printing experience, reduce waste, saving costs and retain Tainui's printing strategy align with other existing business strategies. But, have they really achieved their goals? Have they always followed full compliance with the CSFs? Were there any problems while they implement the project? Anything specific related to outsourcing issues or multi-party collaboration problems? All of those questions will be discovered by the following sections.

Chapter 4 : Methodology

From the literature reviews, questions were identified to ask each of the key stakeholders, in order to get an understanding of the project from different perspectives.

The targeted stakeholders played main roles in the project, which include the project manager (Dave), project coordinator (Lisa), service Delivery specialist (Shelly), technical domain specialist (Steve), system project manager of Skynet (Lily), software development test manager (Jason) and also Peter and Jack who are the managers of Paua.

Dave has comprehensive perspective of the project from the initiation to the end. He would be one of the participants with no doubt. As Lisa was the project coordinator who was assisting Dave by doing lots of liaising works, she has been selected as an important candidate. As Shelly has better understanding of Tainui's previous structure by involved in the Windows 7 project, she knew how people use printers, how many printers on site and etc. Because Steve's role at Tainui is technical domain specialist of infrastructure, he had been involved and managed a lot of aspects of the projects. Lily is a key candidate due to her role was managing the Skynet involvement on the managed print project. Testing is one of the very important phases during the project delivery, thus test manager of Tainui has also been selected as an interviewee. Due to the outsourcing being the main attribute of the project, key stakeholders from external supplier cannot be ignored.

Standard questions were asked to everyone for overviewing the project, providing their own perspectives. Specific questions are also available to some of them, in order

to understand their own role in the project, and whether they performed well from their own cognition as well as from each other's perspective. Sample interview questions include but are not limited to:

General Questions -

- Can you tell me a bit of your role in this project?
- Tell me about the old system and the new system you expected
- Tell me about the project implementation process
- What was done well
- What was not done well
- Do you have any suggestions or recommendations for improvements in the future
-

Specific Questions –

- Did you understand the objective of Tainui for this project, and how well do you understand the existing business and technical infrastructures [question to supplier]
- How was the decision to use Paua made? (question to all internal stakeholders)
- Before it went live, do you consider the system was tested sufficiently? Please explain [question to test manager]

A Human Ethic Committee (HEC) approval had been granted ahead, and all participants were given an information sheet and asked to sign a consent form before the interview. Interviews were held in a private meeting room, and the meetings were one on one sessions, which means the entire meetings were confidential. Interview contents will be audio recorded for further interpretation and analysis.

The outcome of interviews would be compared with the themes from the literature review Findings will emerge from the comparison and analysis of the collected data. Recommendations will be extracted from the literature reviews and findings as well.

Chapter 5 : Data Analysis and Findings

In the literature review section, previous researcher revealed advantages of managed print solution, for instance, information protection, reducing wastes/saving costs, and network-enabled printing capabilities etc. In order to understand the purpose of Tainui implementing a managed print solution, interview questions "Tell me about the old system and the new system" went to all interview participants, to get ideas from their perspectives.

5.1 The facts of implementing a managed print solution

In terms of Information protection, Tainui had a standard printing system which printers connect with computers directly through a local network. When people make prints, it is easy to miss the prints by either forgetting to collect or being inadvertently collected by someone else. Furthermore, if others are interested in the information being printed out, they could easily take it away without notice.

This introduced printing system will not print out anything until the owner of the prints releases the job in front of the new multi-functional printer by using their own identifications (Security Swipe card or manually typed in their User name and Password).

In terms of reducing print wastes and saving cost, Kelly, Regan and Hunt (2004), Dempsey and Palilonis (2012), Taylor and Welch (1992), Ashmore and Morris (2002) implicated that charging users for printing was a legitimate way to recover costs associated with printing and discourage unnecessary printings by individuals. Customer orientated companies could recover their costs by charging customers. But a company like Tainui who is not facing customers directly, the only thing they could do is to reduce wastes and saving costs.

Tainui has different cost centres for different departments, each employee had been appointed to their own cost centre. Once the new printing system implemented, Tainui is able to monitor the quantities and qualities of any single printouts to any individual employee of the company. Cost centre will have regular reports particularly showing the cost of printing from different cost departments. When costs reached a certain level, managers will be looking into it, in order to find out what happening to the high

costs of print. Along with the new printing system, they can easily trace employee who did the large amount of prints. Network-enabled printing solution is the key to make this happen.

Lack of in-time printer maintenance was one of the problems with previous printing system. Employees always had problems when printers out of ink, out of paper or some other technical problems etc. Since the problem has been discovered, a long waiting stage would be carried out. It included reporting to the technology team by the people who discovered the issue, the technology team will contact with the supplier who supports that particular printer model, and finally, they will manage the printer to be fixed or reloaded.

Another issue where (Kelley, Regan and Hunt) found in 2004, no access card means no collection. Tainui's managed printing solution allows users to use their 'network user name and password'2 to collect their prints when they forget bring their 'access card'.

5.1.1 Old system from their perspective

From the interview, we had some fair views to Tainui's old printing system. These views gave us ideas of how different people in the same project perceived the old system.

The service deliver specialist – Shelly, her role started as someone to understand the business, she did the Windows 7 project so she knew how people use printers, how many printers were on site, what application they use, and what specific printers. She also knew things about costing, because she had experience to order parts, to assist printer as well. She described the old printing system as below:

> *The old system similar to what you have at home, when you print document, it get to send to the printer, it come out pretty quickly as soon you done it. However, that would also depend on who are the printers, there wasn't a way confidentially setting that you could set a pin on your documentation, it has to*

[2] User name is normally assigned by the network domain, but password is normally set by user self.

set on the printer, it cause delay to other people potentially, while they waited your document has a pin code on, so it wasn't an ideal solution.

Peter and Jack from Paua, due to they are the provider of new print solution. They really have some particular aspects to criticize below:

There are different invoices they got come from different suppliers. Because each invoice received as cost associated to the business. It cost $55 to process per invoice, and these scenarios applied to all suppliers, service agent was looking after the equipment which was billing associated with that as well.

For example, if it breaks today, you pick up the phone, and ring someone, they might turn up after two days or three days or you have to get them picked up by courier to deliver to them to get fix, that takes lots of time, it's not convenient, it's very expensive. In terms of Toners, you have bulk order your toner and stick under your desk. In terms of power consumptions, you got 10 machines drawing power, they never get turn of. So those are all sort of ad-hoc, messy way of doing things, those are sort of things hang over from how things used to be done.

Dave, the project manager described the old system as below:

The old system was we owned all the hardware, very old hardware, all not ideal, all take time to turn up. It's very hard to replace the old tonners, as the models are so old.

We could easily discover that Tainui and Skynet had this business partnership for a long time from Lily, the Skynet project manager's description below:

The old system was supported by Skynet, there was varies models and printer provider supported by the sales side and main side.

The above quotes from the interview can clearly define the previous printing system as an old system, it was not convenient and expensive for maintenance and

management. Its inefficiency and disadvantages led to the implementation of this new managed print solution. The key project stakeholders' comments are also recorded to describe the new system in the following section.

5.1.2 New system from their perspective

Raj who is a technical domain specialist, he helps projects to identify some of the technical considerations of the infrastructure side before projects start. From his perspective, the new printing system should look like this:

> *One difference between the old and new system was the business more interested in a new feature called Follow you. Different manufactures called the different things, but it's all the same. It's been able to identify yourself at the printer. Have the job print out at the printer you have to identify yourself; the job can follow you around which printer you like, regardless of location.*

Again, because Paua is the provider and designer of this solution, they have much to say:

> *The new system got standby power, we can program those devices to turn off at 6pm the night and start again at 6 am. There are always expenses and cost we can mitigate. We can set the machines to default black and white, if you go fire a print, it's covered in colour, but it just proof and come out as black and white, so it's not costing you much, if you want colour, you have to forced it to colour. We have a monitoring solution called "@Remote", it internally measures the volume, measures the missions, measure the service call, place services calls automatically, order tonners automatically, when we say managed print service, we put all these devices with the software and everything becomes automatically, when they calling us, because we knew all of this already.*

Project manager, Dave has his own perspective of the new printing system:

> *The new environment is a lot cleaner, being a lease to their vendor's advantage that All machines are up and running, they responsible for that. If*

it's not working, they are not making money. In terms of suitability, the printers are more reliable and suits request for fill very very quickly. The toners, they also auto send fault as well.

To describe the new system, Lily also implicated the responsibilities of the project between Skynet and Paua:

In terms of the new print solution. From what I know, it is more standardized. It is limited to 2 or 3 models which obviously made easier to support. Paua provide main support for the printers. Skynet around the back end infrastructure, so the print servers, print queue… those sorts of things.

Lisa finally pinpointed the important part of why and what are we investigating in this paper:

WE invested so much time and money into that follow you strategy, and I suppose the strategy into it was highly driven by the potential cost that business could make out from the follow you printing. That is really a disappointing.

The new printing system should be more standardized and cleaner. More importantly, it should save Tainui's cost from varied ways. For instance, saving power, less colour prints and etc, one of the key features among this implementation is called "Follow you". It is an application associate with the new printer fleet to enable the most saving strategies happen.

Apparently, "Follow you" strategy had fallen over. From my perspective, this failed "Follow you" feature is a main part of the whole project; it was just like a new born baby without his/her brain.

As most people would see, all the old printer fleet had been replaced with the fresh Paua Branded Multi-functional printers. From the perspectives of an outsider, or even

from the internal project manager, this implicated the success of the project implementation. However, Can we really count this as a success?

5.2 Critical Successful Factors

Let us review the critical success factors specified by Slevin and Pinto (1986) (as cited in Pinto and Prescott, 1988) in the previous sector.

5.2.1 Project Mission - A clear sense of direction with clear initial goals

The initial goals of implementing this managed printing solution are, a) to provide an enhanced user print service, b) saving costs by various costs associated designs, c) successfully implement the project within budget by the due date.

If you listen to some of the interview candidates, you would find out the goals were not actually set clearly.

> *I think the project itself along has been finished, and Paua, from their perspective, they replaced all the printers, they have done. From a PMO, project's perspective, all the team has long gone.*
>
> *The implementation was very successful.*

Without the "Follow you" Application, Tainui had not received an enhanced user print service, it is not saving costs by what expected. Because the failing of "Follow you", project had been postponed to another project team which specifically commit to "Follow you" fixing activities. In other words, budget had been exceeded and the complete "Product" had not been delivered by the due date. However, from the participants' perspective, they expressed that they have already done the project, reached the goals and implementation was successful.

5.2.2 Project schedule/plan - A detailed specification and schedule for project implementation

According to the key project participants, Tainui has not done this well as a) when planning this project, the "Follow You" feature is considerably equal or larger than the replacement of old printer fleet. Tainui would be better to consider the possibility his feature might fail.

The technical specialist Steve described the project implementation as below:

> *And it was something we initially think it is phase two activity, but the business was quite interested to implement as part of the new device roll out. Think it would work, it's quite unique, but it turned out the most troublesome area.*
>
> *We probably under estimated how complicated the task would be, to be fair, the realization only came about when we start have problems*.

From the testing perspective, not sufficient testing plan had been created for a huge project like this. According to the test manager Jason:

> *I think it was for what we decided to test as I said before – system talk to the printers. I think the test was ok, I don't know that we could found the issue with the certain features of the follow you printing, I don't think we would necessarily found that with small testing or type of testing.*

Although, from what Paua mentioned below in their interview, it seems they plan/schedule things very critically. However, this study found that they still missed to extend their installation/implementation plan with another key player in this project – Skynet. Otherwise, they would possibly discover the discrepancies in the very early stage to avoid failure of the project later on.

> *Whenever we do an installation of Equistar or any IT solution we put in, we do 1) the proof of concept, 2) the scoping document. And in that scoping document, we talk about what's in scope what is out scope, and what actions belong to which part of business.*

5.2.3 Client Consultation - Adequate communication, consultation, and active listening to and with the client

Tainui project coordinator gave Paua a very positive feedback below to their adequate communication and consultation with the client - Tainui.

They did a quite bit work in understanding what our printer were, where they located, number of people, number of printing job per site. They did a lot of discovery work around what our existing network look like, and then their recommendation how could we significantly reduce the cost on printing, that's how follow you came on board.

However, the test manger of Tainui provided some negative feedback of Tainui:

It was good that it was tight times, so it was keep on track. However those tight times are also the bad thing. Because I don't think we did enough investigation and enough analysis of actually what was required by different business units.

The above comments clearly described that Paua did great effort to the consultation with Tainui. However Tainui did not consult well with its internal stakeholders.

5.2.4 Technical tasks - Required technologies and expertise were available

In order to implement an IT project successfully, key things are the required technology and expertise were available. Apparently, this has been ignored in the MPS project.

As Paua claimed in the interview below:

Part of what in scope, what we asked for in those actions, when we run to install Equistar, we asked to stand up a new server, it's going to be clean, no legacy information on there, tidy up print queue, all of these staff, we need it, it needs to be done before we come to install the system. What we found was that may be that hadn't been done, it caused some issues which took long time to understand what they were.

In addition, Shelly also mentioned:

The reason behind that which was we out on to the old server and infrastructure, they didn't actually cope with the program itself, and so therefore after a period of time it created failure…

In terms of technical tasks, the required technologies and expertise should be available in front of the project. This has been presented as the project infrastructure requirements by Paua, however Tainui did not make this available for Paua, which became another key reason for the failure.

5.2.5 Client acceptance - Final project was sold to the end users

In terms of Client acceptance, it means that the quality assured. In order to confirm the quality assurance, best solution is testing. According to Tainui's testing manager Jason and Paua, their perspective of testing are transcribed as below:

It was very hard to test against no requirements. We had to investigate each of the business units wanted and trying do that, The testing requirements was basically that our system would talk to these printers, plus I have limited time that I was not dedicated fully to the project. – From Test Manager of Tainui, Jason

Another big point was the test environment and production environment need to mirror each other, what we were testing on the test environment and then when you roll out to production, if it's not mirror of that, then you got trouble. That happened. There were legacy programs running in the background. – From Paua

According to Ahmad et al (2010), extra attention to software reliability becomes very important where hardware and software are both provided by the external supplier. Refer to what Jason said and Paua described above, Tainui did not pay enough attention to this problem.

5.2.6 Monitoring and feedback - Provision of comprehensive information at each implementation stage

In terms of monitoring, the project coordinator Lisa provided her perspective below for the pilot implementation stage.

> *We had the majority of the printer of the pilot areas working; we took that as a positive sign. Whereas In fact it properly the telling sign that as wasn't working the 100%, chances are as we add more printers on, it could potentially escalate the problem.*

Apparently, when monitoring the implementation of a system, information was presented to Tainui that something was not quite right. Tainui should take that feedback as a warning message rather than a positive sign.

5.2.7 Communication - An appropriate network for all necessary information to circulate among all key players

Although, everyone knows that "good communication" is the key aspect of implementing a successful project, has Tainui really had good communications along the project?

> *Because there were some of the requirements that Paua said, where the requirements have never pass through to Skynet, so obviously Skynet didn't; do them, because we went nowhere, so a little bit of roles and responsibilities and better communication.*

Lily from Skynet described how information communicated within the printer project above. This kind of explained why Paua did not get a clean and new infrastructure environment.

5.2.8 Troubleshooting - An ability to handle unexpected crises and plan deviations

In fact, problems cannot be predicted or estimated sometimes in the beginning of a project, but at least, we have to have some troubleshooting plans ready to have the ability to cover ourselves.

The service delivery specialist, Shelly described the situations after we encountered the problem.

> *Tainui that now has gone back to printing pretty much the old style, there were increasing cost. There were actually firstly when we flip it back, the drivers on the machine we set to defaulted to colour rather than black and white, so there were increasing cost, there was a huge cost in the first two months when we flip back.*

From the project infrastructure perspective, they seem to have had lots of difficulties for investigating the problem, and the fact was, while they were doing it, the project was still rolling out. Tainui's technical domain specialist Steve explained below:

> *It took a while to discover what happening, because we got a bit complex environment. It is very difficult trying to work out, it has lots of complexity, and you have to trying to isolate every part of the infrastructure. Is it the login, is it the driver, and is it the printer talking to the server? Is it the follow you talking to the server, all of those aspects, needed to be followed up. And the hard part is project can't stop.*

By reviewing these critical factors above, we can see that Tainui did not have a clear sense of direction with clear initial goals; Tainui did not have a detailed specification and schedule of how to implement the project and how to test it. Tainui's technologies and expertise were not quite ready for the project. The testing team of Tainui has done as much testing as they could to assure the quality for user acceptance. While Tainui monitoring progress of the project, Tainui didn't respond the uncertainties appropriately. And most importantly, Tainui did not have a good communication with these two key external parties (Paua and Skynet) along the project. There are also more to be discussed in terms of outsourcing with these two external parties in the next section.

5.3 Outsourcing Issues

Making the right decision not only means to decide whether choose outsourcing, but also outsource from whom, when to outsource and for how long, how to outsource,

fully or partially? All of those questions need to be addressed before the decision can be made. This has been discussed by Ang and Cummings (1997), Ang and Straub (1998), Casale (2001); Loh and Venkatraman (1992a, 1992b), Slaughter and Ang (1996), Stock and Tatikonda (2000), McIvor (2005), Rothery and Robertson (1995) and etc, which also mentioned in the previous Literature review sector.

In terms of outsourcing in this project, two external parties have been involved, Skynet who has been with Tainui for a long period of time, for almost every IT infrastructure operation involved, especially the previous printing infrastructure and this new managed printing solution. According to the technical domain specialist:

> *As our IT infrastructure has entirely outsourced to Skynet. We are outsource the infrastructure operations, I think as the time this project was running, our helpdesk level 1 and 2 (in house) service support, day to day operations and networking and project infrastructure resource all sourced from Skynet.*

Paua, obviously another key stakeholder externally provided the design, hardware, complete solution and ongoing support of this managed print project. Also described by Steve that:

> *Paua provides the devices, they may provide some expertise around the follow you solution and they helped us on the design aspects.*

When selecting suppliers for outsourcing, Tainui really should consider the existing infrastructure supplier considerably, as they are the backend infrastructure system who supports the previous printing system and the new printer system from Paua. They understood Tainui's infrastructure and network better than others. All their experiences and understanding of the existing infrastructures will cope with the new printing system better to bring long term benefits. In terms of responsibilities to Skynet and Paua in this project, Steve explained:

> *From a straight, hardware and software infrastructure perspective, Paua just facilitate the remove the old device and configuring the new one and installation. As well as help with the design aspects of the follow you solution,*

and it was involved Skynet heavily as they have the access to all the servers, which operate things for us.

Paua took care of the logistics aspects with some of the design and Skynet implemented the back end infrastructure part so updating printing servers and print queues, installing new drivers, login screens, and the assisting with the installation of follow you software. Anything involved in touching the infrastructure predominately Skynet, there are some specialized areas.

In addition, Steve also quoted that:

Oobviously Paua run those sort of projects in many other places, have experiences with no problems. If they had experienced problems, we may learn from their experiences, it all gone smoothly at other places, something to do with our own environment and our complexity.

Before this managed print system project, Skynet supported Tainui for a long time period with no problems especially from the printing aspects. Skynet had no bad experiences with other previous projects as well. Then the question is, why the problem occurred when those two parties working together?

5.3.1 Multi-party conflicts

From what we reviewed in the previous literatures, we understand there are some success drivers would allow managers to configure an outsourcing collaboration more sufficiently. For instance, Trust and communication, strong partner competence, detailed process control, incentive alignment and clear milestones etc. (Cui and He, 2009)

Both parties have the right competence and stability, and mutually agreed putting the right incentives and milestones in place while focusing attentions on the most critical factors in managing multi-party collaboration. (Cui and He, 2009)

According to Lai (2005), he mentioned that when multi-parties working together attempt to execute an action, they have to kind of make sure the inputs could trigger

the action and subsequently generate the expected output. The same thing applies to Skynet and Paua, they both have their own ability and specialization, and those are their own inputs. When they isolated before the project, they were working perfectly. They just need to make sure when they work together, they still could make the printer project working perfectly.

According to Steve:

> *I think the hard part is the multiple parties. We got Tainui, we got Paua, we got Skynet, even within Skynet, you have project team, you have day to day operations, and they are not necessarily talk to each other. You got Operation fixing things, and you got the project team, they still running things.*

According to Paua:

> *There were three parties involved in the roll out, we got Tainui as our customer, and Skynet is looking after the network environment. We are sitting here saying we need an environment like this to put in optimal follow you print solution. In this case, it was quite pride on the line, because Skynet has been looking after the network environment for a great period of time, we don't wanna say, hey guys, you guys go do the tidy up jobs, get clear of the whole print queue. It's a big tidy up process, of course cost associate with that as well, for them to accept that. Yes, it is an extra work need to be done there, there are discussion need to done between Tainui and Skynet. Skynet would say, we will tidy up around now, but this is the time else whatever, we were sitting outside to through grenades inside and wait for things to blow up. That's pretty common out there now*

Clegg et al (2004) added that business partners would say what product owners want to hear, thus leave the collaborative process away when the product owner exercise excessive control. From what Paua described above, we could see that Paua was struggling get things they want during the project implementation. From their perspective, this was fully controlled by Tainui. In other words, they were expecting Tainui to get this collaboration done with Skynet, rather than going to them directly.

So, who should be blamed in this situation? Paua, Skynet or Tainui? The responsibility issues were quite worrying for Lisa.

> *We have third party (Skynet) look after our backend system, different third party (Paua) look after the hardware (new printers), different third party (Equistar) look after the follow you application and system. It was difficult to get ownership of any issue. Skynet would say no, it is not our problem. Paua would say no it is not our problem, we could not go directly to the provider of the follow you system, we had to go through Paua. We found that is very frustrating, they did not know the product, obviously it is the vendor they support it.*

In this embarrassing situation, everyone is trying to avoid their responsibility. Tainui really needs a strong leader to make it happen. Lily said:

> *When three parties work together on a project, it can be really difficult at the time. It really does need a strong leader to pull everyone together and get everyone on the same page. There were times all three parties work very well together , but there were also times when there was a little bit of blame game that he said, she said, they didn't do what we asked to or all those sort of things…*

Information flowing in between these three parties seems to be a problem, unclear responsibilities threatened the project. In addition, if no one stood out to clearly state each other's responsibly and efficiently link those three parties for a better communication, it would be no surprise the project failed later on.

Due to the software and hardware were both outsourced in this project, which means it was developed and tested by employees of Paua, but not employees of Tainui or Skynet. Tainui has no control to the quality of either hardware or software. Tainui only had the chance to test when the hardware and software had already been installed and placed in to Tainui's offices. There was no way for Tainui to realize any potential issues of the system in the early stage.

On the other hand, it was really challenging for testers of Tainui. Because of its late involvement, testers only have chance to test the integration between the printer itself with existing system and network of Tainui. It would be not surprising that testing has not been done comprehensively in this project. This would be another potential reason causing the failure of the project.

Chapter 6 : Conclusion and Suggestions

"Follow you" as a key feature of the managed printing solution failed less than a month after the project roll out. Nevertheless, the new printer fleet has already produced positive results – they are now all carboNZero certified, and the total print costs have reduced by around 30%, according to Tainui's internal news in May, 2013.

By considering the initial objectives and the main purposes of doing this project, a) implement an enhanced managed print solution to our end users, b) save costs (where the most issues previously was wastes), c) deliver the project on time on budge.

Tainui has replaced the entire old printer fleet successfully. However, employees of Tainui are still having experience of printing the old way, this has not been changed as expected. Although, the new printer fleet reduced power consumptions, reduced the cost of printer maintanance for Tainui. But at the same time, more costs occurred by extending the project to fix the "Follow you" feature. Employees have also demonstrated their frustrations regarding the down times of the project.

According to Cardinali (1998), the failure of Managed Print Solution project cost Tainui immediate lost productivity in a short period, immediate lost sales in a short period, definitely emergency service cost, and cost of restoring the new printing strategy back to standard printing. As well as debugging and fixing the problem since it happened. All these costs affected Tainui from different aspects and stages.

It was a good idea to introduce this managed printing solution. Tainui really should have a mutual understanding of their objectives with Skynet and Paua in the beginning. If something huge is to be considered in the beginning of the planning stage, in this case, the "Follow you" application. Tainui should stage the project to

two phases or even more. Firstly phase, implementing the hardware replacement, and then implementing the "Follow you" application as the second phase.

Although Tainui has its dedicated project manager for the managed print solution, it would be nice to have a stronger leader to make the confidence to move forward and that each party has a part to play in the deployment. Each party has a really good key understanding of what they have to provide and deliver and their responsibilities etc.

When Tainui faces uncertainties, no matter at what stage, it is important to stop and check things properly. Planning ahead to make sure the uncertainties would be covered and could be restored if anything happens unexpected. Some kind of checkpoints process is recommended here.
Communication should always on the top priority at any stage of the project. Having a bit better understanding, it could potentially avoid the risk. Having a bit better understanding once a problem occurs, in this multi-party scenario, it needs information to flow efficiently through each party.

Lastly, quality assurance, in other words testing; it is an unavoidable aspect of a project. Tainui definitely needs dedicated resources to deal with the testing thoroughly, rather than partial testing or part time resources allocation.

There is something Paua said at the end of their interview, it stuck in my mind for a long time.

> *We had instance with Equistar, with clean environments, we just go plug and play without a problem. We also have done good follow you print installation partners with Skynet, we worked together really well before.*

Chapter 7 : Current Stage and Challenges facing the organization

According to Skynet and Paua, they are very confident now. There are 20 devices in the test environment which are fully operational. They are just about to upgrade the current test environment from 4.2.3 to 4.2.6, the reason for doing that is because a new family device is coming out, they need to run on 4.2.6 to be certified. Next week

they are looking to get a pilot site in Hamilton. Actually, it will be turning on the "Follow you" printing again.

By interviewing different stakeholders who played important roles in the project, it indicateds challenges facing Tainui which worth to consider.

Everybody recognizes the fact that Tainui is made up of numbers of organizations who have their existing systems and processes in place, including backend network infrastructure and so on. Some of those are quite legacy type applications that always create addition challenges irrespective of what you tried to roll out on the organization arrangements.

Another challenge is Tainui's planning and budgeting mechanism. This was one of the potential reasons why the management team insisted on getting the whole project (Replace the printer fleet and Implement "Follow you" application) to roll out at the same time. Because they did not want to carry the project to a new financial year, as everything had been planned and settled, they did not expect a project suddenly to roll over and eat into project capital even if the project has uncertainties or issues occurred.

Furthmore, arbitrary decisions are made by the top management team of Tainui, employees' opinions are neglected, and this is slowly forming a negative organizational culture and climate that Tainui would not expect to see.

References

Adams, J. & Barndt, S. (1988). Behavioral implications of the project life cycle. *Project Management Handbook*, New York, NY Wiley. 206-30.

Ahmad, N., Khan, M. G. M., & Rafi, L. S. (2010). A study of testing-effort dependent inflection S-shaped software reliability growth models with imperfect debugging. *The International Journal of Quality & Reliability Management*, 27(1), 89-110. doi:http://dx.doi.org/10.1108/02656711011009335

Ang, S., & Cummings, L. L. (1997). Strategic response to institutional influences on information systems outsourcing.*Organization Science, 8*(3), 235-256. Retrieved from http://search.proquest.com/docview/213828272?accountid=14782

Ang, S., & Straub, D. W. (1998). Production and transaction economies and IS outsourcing: A study of the U.S. banking industry. *MIS Quarterly, 22*(4), 535-552. Retrieved from http://search.proquest.com/docview/218118073?accountid=14782

Ashmore, B., & Morris, S. E. (2002). From scraps to reams: A survey of printing services in academic libraries. *College & Research Libraries, 63*(4), 342-352. Retrieved from http://search.proquest.com/docview/199501696?accountid=14782

Belassi, W. & Tukel, O. I. (1996). A new framework for determining critical success failure factors in projects. *International Journal of Project Management, 14*(3), 141-151.DOI: 10.1016/0263-7863(95)00064-X.

Belout, A. & Gauvreau, C. (2004), "Factors influencing project success: the impact of human resource management", *International Journal of Project Management, 22*(1), 1-11.

Buxbaum, P, "Bringing IT Back Home." Computerworld. Volume 36, No. 31, (July 29, 2002): p. 38.

Caldwell, B. (2002a). 2001 Trends in IT Outsourcing Delivery, Solution Development, Marketing, Sales and Alliances. *Gartner Dataquest Report,* Stamford.

Caldwell, B. (2002b). Outsourcing Cost Reduction Creates Paradox: How to Still Make a Profit. *Gartner Dataquest Report,* Stamford.

Calloway, M. (2003). Paper use and recycling in academic libraries. *Electronic Journal of Academic and Special Librarianship*, 4(2/3). Retrieved from http://southernlibrarianship.icaap.org/content/v04n03/Calloway_m01.htm

Cardinali, R. (1998). If the system fails, who is liable? *Logistics Information Management, 11*(4), 257-257. Retrieved from http://search.proquest.com/docview/220036078?accountid=14782

Casale, F. "IT Index 2001." The Outsourcing Institute/Sunguard eSourcing Report, April 15, 2001 (available online at http://www.outsourcing.com/).

Cipriano, F. (1995). The impact of information systems on quality performance: an empirical study. *International Journal of Operations & Production Management*, *15*(6), 69-83.

Clegg, S. R., Kornberger, M., & Rhodes, C. (2004). Noise, parasites and translation: Theory and practice in management consulting. *Management Learning, 35*(1), 31-44. Retrieved from http://search.proquest.com/docview/209874775?accountid=14782

Cui, Z., Loch, C. H., Grossmann, B., & He, R. (2009). OUTSOURCING INNOVATION. *Research Technology Management, 52*(6), 54-63. Retrieved from http://search.proquest.com/docview/213799728?accountid=14782

Daniel, D. R. (1961). Management information crisis. *Harvard Business Review, 39*(5), 111-121.

Daniel, D. (1998, Apr 06). Printer management moves to the wild side. *Computing Canada, 24*, 33-33. Retrieved from http://search.proquest.com/docview/225016900?accountid=14782

DeLone, W. & McLean, E. (1992). Information systems success: the quest for the dependent variable. *Information Systems Research, 3*(1), 60-95.

Dempsey, M. E., & Palilonis, A. (2012). Reuse, recycle ... reduce: A greener library with print management. *Library Hi Tech, 30*(3), 408-417. doi: http://dx.doi.org/10.1108/07378831211266555

Fill, C., & Visser, E. (2000). The outsourcing dilemma: A composite approach to the make or buy decision. *Management Decision, 38*(1), 43-50. Retrieved from http://search.proquest.com/docview/212061448?accountid=14782

Finch, P. (2003). Applying the slevin-pinto project implementation profile to an information systems project. *Project Management Journal, 34*(3), 32-39. Retrieved from http://search.proquest.com/docview/218760576?accountid=14782

Fowler, A. & Walsh, M. (1999). Conflicting perceptions of success in an information systems project. *International Journal of Project Management, 17*(1), 1-10.

Gibler, K. M., & Black, R. T. (2004). Agency risks in outsourcing corporate real estate functions. *The Journal of Real Estate Research, 26*(2), 137-160. Retrieved from http://search.proquest.com/docview/200291976?accountid=14782

Guinan, P. J., Cooprider, J. G., & Faraj, S. (1998). Enabling software development team performance during requirements definition: A behavioral versus technical approach. *Information Systems Research, 9*(2), 101-125. Retrieved from http://search.proquest.com/docview/208176333?accountid=14782

Gupta, U. G., & Gupta, A. (1992). Outsourcing the IS function: Is it necessary for your organization? *Information Systems Management, 9*(3), 44-44. Retrieved from http://search.proquest.com/docview/214130302?accountid=14782

Hanisch, J., & Corbitt, B. (2007). Impediments to requirements engineering during global software development. *European Journal of Information Systems, 16*(6), 793-805. doi:http://dx.doi.org/10.1057/palgrave.ejis.3000723

Hardy, C., Lawrence, T. B., & Grant, D. (2005). Discourse and collaboration: The role of conversations and collective identity. *The Academy of Management Review, 30*(1), 58-77. doi:http://dx.doi.org/10.2307/20159095

Hendry, J. (1995). Culture, community, and networks: The hidden cost of outsourcing. *European Management Journal, 13*(2), 193-193. Retrieved from http://search.proquest.com/docview/237007779?accountid=14782

Hiemstra, G. & Tilburg, J.J. (1993). Outsourcing of information systems. *Business Quarterly*, *55*(4), 62-65

Huff, S. (1991). Outsourcing of information systems. *Business Quarterly*, 55(4), 62-65.

Jehiel, P. (1999). Information aggregation and communication in organizations. *Management Science, 45*(5), 659-669. Retrieved from http://search.proquest.com/docview/213166118?accountid=14782

Jiang, J. J., Klein, G., & Balloun, J. (1996). Ranking of system implementation success factors. *Project Management Journal, 27*(4), 49-53. Retrieved from http://search.proquest.com/docview/218739096?accountid=14782

Kai, S., & Uehara, T. (2011). Development of a distributed print-out monitoring system for efficient forenisic investigation. *Proceedings of the Conference on Digital Forensics, Security and Law,* 109-122. Retrieved from http://search.proquest.com/docview/884340748?accountid=14782

Karlsen, J. T., & Gottschalk, P. (2004). Factors affecting knowledge transfer in IT projects. *Engineering Management Journal, 16*(1), 3-10. Retrieved from http://search.proquest.com/docview/208967345?accountid=14782

Kavcic, K., & Tavcar, M. I. (2008). Planning successful partnership in the process of outsourcing. *Kybernetes, 37*(2), 241-249. Retrieved from http://dx.doi.org/10.1108/03684920810851140

Kelley, G., Regan, E. A., & Hunt, C. S. (2004). *Implementation of a network print management system: Lessons learned*. Hershey, United States, Hershey: IGI Global. Retrieved from http://search.proquest.com/docview/192335571?accountid=14782

Lacity, M. C., & Willcocks, L. P. (1998). An empirical investigation of information technology sourcing practices: Lessons from experience. *MIS Quarterly, 22*(3), 363-408. Retrieved from http://search.proquest.com/docview/218118133?accountid=14782

Lai, X. (2007). Outsourcing and multi-party business collaborations modeling. *Journal of Electronic Commerce in Organizations, 5*(2), 77-92,94-96. Retrieved from http://search.proquest.com/docview/236477181?accountid=14782

Lawrence, P. & Scanlan, J. (2007). Planning in the dark: Why major engineering projects fail to achieve key goals. *Technology Analysis & Strategic Management, 19*(4), 509-525. DOI: 10.1080/09537320701403508.

Levina, N., & Ross, J. W. (2003). From the vendor's perspective: Exploring the value proposition in information technology outsourcing(1)(2). *MIS Quarterly, 27*(3), 331-364. Retrieved from http://search.proquest.com/docview/218142479?accountid=14782

Levina, N. (2005). Collaborating on multiparty information systems development projects: A collective reflection-in-action view. *Information Systems Research, 16*(2), 109-130. Retrieved from http://search.proquest.com/docview/208178705?accountid=14782

Loh, L., & Venkatraman, N. (1992). Determinants of information technology outsourcing: A cross-sectional analysis. *Journal of Management Information Systems*, *9*(1), 7-24.

Loh, L., & Venkatraman, N. (1992). Diffusion of information technology outsourcing: influence sources and the Kodak effect. *Information Systems Research*, *3*(4), 334-378.

Loosemore, M. (1998). The influence of communication structure upon crisis management efficiency. *Construction Management and Economics, 16*(6), 661-671. Retrieved from http://search.proquest.com/docview/213267349?accountid=14782

Marcum, J. W. (1994). Information systems outsourcing: Myths, metaphors, and realities. *National Productivity Review, 13*(2), 314-314. Retrieved from http://search.proquest.com/docview/215032069?accountid=14782

Markus, M. L., Axline, S., Petrie, D., & Tanis, S. C. (2000). Learning from adopters' experiences with ERP: Problems encountered and success achieved. *Journal of Information Technology, 15*(4), 245-265. Retrieved from http://search.proquest.com/docview/216212425?accountid=14782

Matsumura, T., Monden, A., Morisaki, S., & Matsumoto, K. (2008). Analyzing factors of defect correction effort in a multi-vendor information system development. *The Journal of Computer Information Systems, 49*(1), 73-80. Retrieved from http://search.proquest.com/docview/232574261?accountid=14782

Maylor, H., Vidgen, R. & Carver, S. (2008). Management complexity in project-based operations: A grounded model and its implications for practice. *Project Management Journal, 39*, S15-S26. DOI: 10.1002/pmj.20057.

McDougall, P. (2002). New deals may be start of something big. *InformationWeek,* (915), 22. Retrieved from http://search.proquest.com/docview/229047264?accountid=14782

McIvor, R. (2005). The outsourcing process; strategies for evaluation and management. *Reference and Research Book News, 20*(4), Retrieved from http://search.proquest.com/docview/199718377?accountid=14782

Olson, D. (2004), Introduction to Information Systems Project Management, 2nd ed., *McGraw-Hill*, New York.

Park, B. (1997). Charging for printouts. *The Bottom Line, 10*(4), 148-152. Retrieved from http://search.proquest.com/docview/219145076?accountid=14782

Pinto, J.K. & Slevin, D.P. (1987). Critical success factors in successful project implementation. *IEEE*. 34(1), 22-7.

Pinto, J.K., & Prescott, J.E. (1988). "Variations in critical success over the stages in the project life cycle", *Journal of Management*, *14*(1), 5-18.

Polzer, J. T., Milton, L. P., & Swann, W. B., Jr. (2002). Capitalizing on diversity: Interpersonal congruence in small work groups. *Administrative Science Quarterly, 47*(2), 296-324. doi:http://dx.doi.org/10.2307/3094807

Rockart, J. (1979). Chief executives define their own data needs. *Harvard Business Review, 57*(2), 81-94.

Rosacker, K. M., & Olson, D. L. (2008). Public sector information system critical success factors. *Transforming Government: People, Process and Policy, 2*(1), 60-70. doi:http://dx.doi.org/10.1108/17506160810862955

Rothery, B. & Robertson, I. (1995). *The truth about outsourcing* Ashgate Publishing Company Ltd. Retrieved from http://search.proquest.com/docview/59700005?accountid=14782

Rubinstein, D. (2007). Standish group report: There's less development chaos today. *Software Development Times*, (169), 1-1,19. Retrieved from http://search.proquest.com/docview/232468355?accountid=14782

Scaff, M. (1201). *Apparatus and method for metering and monitoring print usage at non-network printers* Retrieved from http://search.proquest.com/docview/1031349489?accountid=14782

Simon, H.A. (1997). Administrative Behaviour: A Study of Decision-Making Processes in Administrative Organizations. Free Press, New York.

Shenhar, A. J., Dvir, D., Levy O. & Maltz, A. C. (2001). Project success: A multidimensional strategic concept. Long Range Planning – *International Journal of Strategic Management, 34*, 699-725.

Slaughter, S., & Ang, S. (1996). Employment outsourcing in information systems. *Association for Computing Machinery.Communications of the ACM, 39*(7), 47. Retrieved from http://search.proquest.com/docview/237043310?accountid=14782

Slevin, D.P. and Pinto, J.K. (1986). The project implementation profile: new tool for project managers. *Project Management Journal*, *17*(4), 57-70.

Stock, G. N., & Tatikonda, M. V. (2000). A typology of project-level technology transfer processes. *Journal of Operations Management, 18*(6), 719-737. Retrieved from http://search.proquest.com/docview/219594220?accountid=14782

Taylor, S., & Welch, B. C. (1992). *Provision of computer printing capabilities to library patrons. SPEC kit 183.* ().Systems and Procedures Exchange Center, Office of Management Services, Association of Research Libraries, 1527 New Hampshire Ave., NW, Washington, DC 20036. Retrieved from http://search.proquest.com/docview/62839571?accountid=14782

Ten ways colleges can cut IT costs. (2002). *The Chronicle of Higher Education, 49*(6), A.39-A.43. Retrieved from http://search.proquest.com/docview/214703239?accountid=14782

Williamson, O. E. (1979). Transaction-cost economics: The governance of contractual relations. *Journal of Law and Economics, 22*(2), 233-261. Retrieved from http://search.proquest.com/docview/38287430?accountid=14782

Winkleman, M, Dole D, Pinkard, L, Molloy, J. et al. (1993). The outsourcing source book. *Journal of Business Strategy*, 14(3), 52-56.

Zeng, S. X., Lou, G. X., & Vivian W.Y. Tam. (2007). Managing information flows for quality improvement of projects. *Measuring Business Excellence, 11*(3), 30-40. doi: http://dx.doi.org/10.1108/13683040710820737