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Journey of an Accounting Software Company from Desktop to Online

A Dissertation
submitted in partial fulfilment
of the requirements for the Degree of
Bachelor of Software & Information Technology (Honours)
at
Lincoln University
by
Pamela Benbow

Lincoln University
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Abstract of a Dissertation submitted in partial fulfilment of the requirements for the Degree of Bachelor of Software & Information Technology (Honours).

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by

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The purpose of this research was to explore experiences of an accounting software company (CRS Software Limited) as it transformed its application from a desktop version to online. A case study approach was taken and semi-structured interviews were conducted with eight employees. Additional data on CRS Software Limited is found from publicly available information including press releases, videos, company web site, customer testimonials and program help files. Three key components of the journey were identified. The first is the use of a modern web based application offering advantages such as accessibility, data sharing, increased security, Software as a Service, program updates and automated backups. Concerns include data security, reliance on internet and data ownership. The second key component is the software company, experiencing challenges as it develops and supports cloud computing. These are addressed through business strategy and operational changes. The customer is the final component, and the move to accounting applications in the cloud is dependent on their perspective on change: a willingness to embrace technology, or a reluctance for change. The three components are discussed independently, yet aspects of them inter-relate with each other. This study contributes to the body of knowledge for a current issue faced by many accounting software developers, and their customers. Observations of CRS Software Limited’s journey are transferable to other accounting software developers, local and international and other computing applications.

Keywords: cloud accounting, cloud computing, Software as a Service, accounting software
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Chapter 1
Introduction

1.1 Introduction

Changes in computer technology have affected how businesses integrate software into their daily activities over the last 30 years (Nuthall, 2004). Managers rely on information to support decision making and need it to be accessible, reliable and easy to understand. Software companies are challenged to keep up with customer demands, technological developments, and the need to be innovative (Ernst & Young, 2011). One of the largest changes is the transition from desktop software to internet based cloud services (Dimitriu & Matei, 2014a). The internet offers opportunities and growth for both customer and software provider but also introduces concerns that need to be addressed by both parties.

Prior studies have been predominantly from a user perspective (Abra, 2015; Baker, 2010; Brandas, Megan, & Didraga, 2015; Dimitriu & Matei, 2014b, 2015), but also from accountants (CCH, 2013; Dimitriu & Matei, 2014a, n.d.). Ernst & Young (2011) consider these viewpoints, but also include questions for cloud service providers to consider. Software developers need to balance their skills and resources available with what users are seeking when developing new applications. The business model of a software company is dependent on successfully creating and marketing online products that are desired by their customers. During product development, each opportunity and issue needs to be addressed, along with the impacts on both the business and customers.

Cloud computing enables automated processes to capture data faster and more easily (Brandas et al., 2015; Dimitriu & Matei, 2015; Johnston, 2013), providing greater quantities of data for business decisions. Accessibility is increased through the internet, making it available to any device with a web browser (Abra, 2015; Brandas et al., 2015; CCH, 2013; Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014a, 2014b, 2015, n.d.; Ernst & Young, 2011), and to multiple people in varying locations (Abra, 2015; Brandas et al., 2015; Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014a, 2014b, 2015, n.d.; Ernst & Young, 2011; Johnston, 2013). These main benefits of online computing are the drivers for an increase in software moving to the cloud.

There are a number of concerns too. Security of data in the cloud and the possibility of privacy breaches (Allen & Wolfert, 2011; Brandas et al., 2015; CCH, 2013; Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014a, 2014b, 2015, n.d.; Ernst & Young, 2011); ownership issues concerning the data (Baker, 2010; Dimitriu & Matei, 2014a, 2014b; Ernst & Young, 2011); and reliance on
connectivity to the internet (Allen & Wolfert, 2011; Baker, 2010; Brandas et al., 2015; Dimitriu & Matei, 2014a, 2014b, 2015, n.d.), especially in remote rural areas.

1.2 Research purpose and objectives

The purpose of this research is to explore the experiences of CRS Software Limited (CRS Software), an accounting software development company in the transformation of their software from desktop to cloud services. Gaining a deeper understanding of this journey will identify lessons that can be transferable to other software companies. It also creates awareness for cloud software users and may alleviate resistance due to perceived problems.

The research objectives are thus to identify:

- The benefits and concerns of transforming desktop software to online/cloud.
- Factors affecting the business on their journey to develop online/cloud applications.
- Factors affecting the customers on their transition to using online/cloud applications.

The literature and research objectives above lead to the following research question:

What are the factors and issues encountered by a software development company in their journey from developing desktop software to cloud application software?

The research addresses this question through a case study approach. Data is predominantly collected through semi-structured interviews of employees of CRS Software, focusing on individual experiences as the company has transitioned over the last ten years from providing desktop software, to a hybrid system in 2009 with data in the cloud, and looking towards the future of a full modern web based application. Additional data on CRS Software is found from publicly available information including press releases, videos, company web site, customer testimonials and program help files.

The New Zealand software industry is limited with only a few developers offering solutions. Some factors identified by a local developer may be specific to New Zealand software, but others will equally apply to other parts of the world, to other sectors, or even to other cloud computing applications.
1.3 CRS Software

CRS Software is a New Zealand accounting software development company, providing specialised farm management software including budgeting, accounting and tax compliance functions for farmers. The company was founded by three farmers (CRS Software Ltd, 2015a) over 30 years ago (CRS Software Ltd, 2014b). Managing director, Brian Eccles describes the “focus [is] about what farmers want and not what accountants want, and they are very different” (Rural News Group, 2015), differentiating themselves from competitors. Their original program was developed 30 years ago (CRS Software Ltd, 2016; Rural News Group, 2015) as a desktop version. The same application was released as a hybrid version in 2009 (Rural News Group, 2015), whereby the program was loaded to the user’s computer hardware but accessed data stored online. They are in the midst of transforming their program, Cashmanager RURAL, to a modern web based application and will continue to be “tailored to rural business” (CRS Software Ltd, 2015a).

1.4 Structure of dissertation

A summary of the relevant literature discussing cloud-based accounting is included in Chapter 2, with a specific focus on factors affecting user adoption of a modern web based application. The research approach used, selection of the case study, data collection and analysis is detailed in Chapter 3.

Results and discussion are explained in Chapter 4, looking in detail at the various factors affecting modern web based application (Section 4.3), business (Section 4.4) and customer (Section 4.5). Further investigation considers how these participants interact and inter-relate with each other (Section 4.6). The discussion concludes in Chapter 5, including contributions made, acknowledgement of limitations and suggestions on future research.

Additional supporting documentation is included the appendices. Appendix A includes a sample of the interview questions and information for participants. Appendix B includes coding themes and definitions used in data analysis.
Chapter 2
Literature Review

2.1 Cloud computing

*Cloud computing* is simply defined as “business performed over the Internet, without the use of computer hardware or software licence” (Dimitriu & Matei, 2014b, p. 841). The term is used synonymously with *software-as-a-service* or *SaaS* (Baker, 2010; Cloud Accounting Institute, 2014) or *modern web based application*. Other researchers explain the concept through a description of functions and benefits of use (Allen & Wolfert, 2011; Dimitriu & Matei, n.d.; Johnston, 2013). Ernst & Young (2011) uses a more technical definition as set by the US National Institute of Standards and Technology (NIST) (Mell & Grance, 2011, p. 2) that incorporates key aspects of functionality:

> “Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and four deployment models.”

The essential characteristics include: on-demand self-service; broad network access; resource pooling; rapid elasticity; and measured service. The three service models are: Software as a Service (SaaS); Platform as a Service (PaaS); and Infrastructure as a Service (IaaS). Deployment models include: private cloud; community cloud; public cloud; and hybrid cloud (Mell & Grance, 2011).

2.2 Online accounting

“Cloud accounting” or “online accounting” is a specialised area of cloud computing, offering accounting solutions. Dimitriu and Matei (2014b) suggest that there is no established definition for cloud accounting, but describes it through functions and benefits of use (Brandas et al., 2015). The service model used by cloud accounting is SaaS, being software, not a platform or infrastructure that is provided. Cloud accounting is predominantly deployed in the public cloud, although some software providers have implemented a hybrid model (Baker, 2010) as an intermediary step between desktop software and a full cloud version.

Cloud accounting has been around since the late 1990’s (Ernst & Young, 2011; Johnston, 2013) but it is only in the last decade that it has made a huge impact on business management (Abra, 2015; Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014a, 2014b, n.d.; Ernst & Young, 2011; Johnston,
There has been little academic study on the topic (Dimitriu & Matei, 2014a, 2014b), and the researcher identified none specifically on cloud accounting for farmers. Studies that have been published are supported by white papers from professional accounting bodies, and industry articles. In many cases, the focus is predominantly on the perspective of accountants (CCH, 2013; Johnston, 2013) but also the needs of their clients (Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014b, 2015), showing many common opportunities and threats between groups. The author could not find any literature from the perspective of a developer of accounting software.

2.3 Factors

Prior studies have identified many factors that provide benefits or introduce concerns in using a modern web based application. These align with the essential characteristics as defined by NIST.

2.3.1 Accessibility

Any digital device that can access the internet through a browser then becomes a portal to the software application without the need to install software (Dimitriu & Matei, 2014a, 2014b, 2015, n.d.). Restrictions of device, operating system and location are removed (Abra, 2015; Baker, 2010; Dimitriu & Matei, 2014a, 2014b, 2015), providing far more freedom and personal choice to users. It is a global approach to business (Brandas et al., 2015; Dimitriu & Matei, 2014b), suitable for businesses with multiple locations (Baker, 2010) or those who spend time away from the office (Abra, 2015). Accessibility from multiple locations was considered the greatest benefit of cloud computing by 62% of accountants surveyed (CCH, 2013).

There is a great reliance on mobile devices (Cloud Accounting Institute, 2014) and in particular Baker (2010, p. 38) notes “the growth of the Apple Mac in the business space (driven by iPhone and iPad)” as a business tool. In the event of lost, stolen or damaged devices, it is only the device that needs to be replaced, as data is stored in the cloud and easily accessed online through a replacement device (Abra, 2015; Dimitriu & Matei, 2015).

A single version of the data is accessible by multiple users at any time, and so information is real-time (Dimitriu & Matei, 2014a, 2014b, 2015, n.d.). This enables greater collaboration between businesses and their advisors (Dimitriu & Matei, 2014a, 2015, n.d.; Johnston, 2013), improving productivity and efficiency (Abra, 2015; Cloud Accounting Institute, 2014; Dimitriu & Matei, 2015) and informed decision making (Dimitriu & Matei, 2014b).
2.3.2 Data security

Data security is a major concern and the largest barrier for users when considering moving to a cloud application (CCH, 2013; Dimitriu & Matei, 2014a; Ernst & Young, 2011). Security was the top concern for 63% of businesses surveyed by Cloud Accounting Institute (2014, p. 9). Users feel a loss of control over data (Dimitriu & Matei, 2014a, 2014b), as details of the physical location and security processes protecting data are unknown (Brandas et al., 2015; Ernst & Young, 2011). There is distrust that personal and sensitive information is vulnerable to a breach of privacy (Brandas et al., 2015; Ernst & Young, 2011), unauthorised access, information theft and hacking (Dimitriu & Matei, 2014a, 2014b). This concern extends to access of data by local councils and government (Allen & Wolfert, 2011).

In practicality, the reputation of a cloud provider is at risk in the event of a security breach (Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014b), so the security protocols employed are more specialised than what the average business may have (Abra, 2015; Brandas et al., 2015; Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014a, 2014b, n.d.). Businesses can take advantage of high levels of security for minimal cost (Baker, 2010; Cloud Accounting Institute, 2014; Ernst & Young, 2011) and for this reason Ernst & Young (2011) projects that in five years it will be a prime reason for businesses to move their data online. In a CCH (2013, p. 4) survey 18% of accountants identified security as a key benefit of cloud computing. There is an increasing realisation that data is more secure online than on a local device (Dimitriu & Matei, 2015).

Automated regular backups (Baker, 2010; Brandas et al., 2015; Dimitriu & Matei, 2014a, 2014b, 2015, n.d.) ensure that there is a faster recovery time in event of lost or damaged devices (Abra, 2015; Brandas et al., 2015; Dimitriu & Matei, 2015). Moving to the cloud outsources “tasks which add no value to your core business” (Baker, 2010, p. 36) such as backups, data integrity checks and software updates. Data is stored in an encrypted format (Dimitriu & Matei, 2015) providing additional security.

Businesses using online accounting do hold concerns over business continuity of the application provider (Brandas et al., 2015) and the dependency on that service in order to access accounting information (Dimitriu & Matei, 2014b).

2.3.3 Data sharing

Data sharing between applications eliminates the need to manually enter information from paper or other electronic sources (Baker, 2010). It is a form of collaborative, electronic data gathering (Brandas et al., 2015) and can remove repetition and duplication of data entry (Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014a). Complicated tasks are simplified as the data gathering is
automated (Dimitriu & Matei, 2014a). Information is available in real-time and there is only one version, supporting better information for decision making (Cloud Accounting Institute, 2014).

Integration is only emerging, but there are expectations of growth as users are not yet benefiting from this functionality (Cloud Accounting Institute, 2014). The quantities of collected data is increasing, which will result in a need to exchange data between applications to draw information from it (Allen & Wolfert, 2011). A lack of standards with data sharing is slowing developments in this area (Allen & Wolfert, 2011; Brandas et al., 2015), but it is easier to make links between applications when they are cloud based (Abra, 2015; Baker, 2010).

Allen and Wolfert (2011) identified a need for business-to-business e-commerce along the whole agri-food supply chain. With the emergence of high-tech sensors and precision agriculture, there needs to be more connection between agribusiness management tools (Allen & Wolfert, 2011). Data sharing with accounting applications already exists with the import of electronic bank transactions (Johnston, 2013), payroll (Johnston, 2013), sales and purchase orders (Abra, 2015).

2.3.4 Internet connectivity

Using an application where data is cloud based, relies on an internet connection (Allen & Wolfert, 2011; Brandas et al., 2015). Interruptions to the connection affect user’s efficiency (Dimitriu & Matei, 2014a, 2014b, 2015, n.d.) and issues of reliability, latency, and speed all contribute to user frustrations (Allen & Wolfert, 2011; Baker, 2010).

2.3.5 Automated updates and version control

Regular software updates are managed by the application provider allowing the user to focus on core business activities (Abra, 2015; Baker, 2010). Update of the program is automatic, and so the latest version is immediately available for the user (Dimitriu & Matei, 2015). Of the accountants surveyed, 28% said that this feature was a key benefit (CCH, 2013), and 57% of businesses expected to reduce their costs by using a cloud solution due to simplified software management (Cloud Accounting Institute, 2014).

2.3.6 Software as a Service (SaaS)

A subscription fee is paid for the right to use the accounting application and digital storage (Brandas et al., 2015; Dimitriu & Matei, 2014b, 2015; Ernst & Young, 2011), instead of an upfront capital expense for ownership of the software program (Brandas et al., 2015; CCH, 2013; Dimitriu & Matei, 2014b, 2015; Ernst & Young, 2011). There is no investment required in infrastructure (Brandas et al., 2015; CCH, 2013; Dimitriu & Matei, 2014a, 2014b; Johnston, 2013), and costs associated with
maintaining one (Abra, 2015; CCH, 2013; Dimitriu & Matei, 2014a, 2014b), as fixed capital expenditure is changed into variable operating costs (Dimitriu & Matei, 2014b, n.d.).

Price is an important feature of cloud software for 57% of accountants surveyed (CCH, 2013), typical fees are a fixed amount paid monthly or yearly (Brandas et al., 2015; Dimitriu & Matei, 2014b, n.d.; Ernst & Young, 2011), instead of a one-off fee on the release of a new desktop version. A variety of pricing plans are often available based on the level of resources used (Dimitriu & Matei, 2014b). There are usually options for scalability to cater for changing business needs (Baker, 2010; Dimitriu & Matei, n.d.; Ernst & Young, 2011), but there is loss of access to the data if payments of fees have stopped (Baker, 2010). There are no extra fees associated with upgrades (Dimitriu & Matei, 2014b).

Cloud computing provides access to advanced software technologies, that are normally unaffordable to small and medium sized businesses, as they are only paying for the resources that they are using (Dimitriu & Matei, 2015, n.d.; Ernst & Young, 2011).

2.4 **Online accounting for farmers**

Factors specific to the use of farm management tools by New Zealand farmers were investigated by OneFarm, Centre of Excellence in Farm Business Management (Allen & Wolfert, 2011; Dooley, Hammond, Allen, & McLean, 2012). The needs of these managers are much wider than just accounting. Production tools are the most prevalent (Dooley et al., 2012), for example management of feed, nutrients, or stock (Allen & Wolfert, 2011). High-tech sensors capturing data on precision agriculture and monitoring of environmental vulnerability, is going to increase demands for data and information sharing. Complications are introduced by a lack of standards on sharing information between systems. Benchmarking tools are another area of data sharing New Zealand farmers are demanding. They want to be able to compare between farms, for both multi-farm holdings and farms within regions (Allen & Wolfert, 2011).

Securing internet connectivity and speed is a barrier for remote properties looking to embrace the opportunities of cloud computing. A lack of skills to use the computer systems or understanding the information may be a factor, but there is an expectation that computer skills and education levels are increasing with each generation of farmer. New Zealand farmers are reluctant to spend money on IT costs as it may not increase profitability (Allen & Wolfert, 2011), but a cloud accounting solution may be an affordable option. These concerns are not reported by OneFarm as specific to cloud computing, but are relevant factors to the research proposed.
2.5 Chapter summary

Chapter 2 reviewed prior studies, defined key terms and identified factors affecting users of cloud computing.

The term cloud computing is used synonymously with Software as a Service (SaaS) and modern web based application and is formally defined by the US National Institute of Standards and Technology (NIST), as described in Section 2.1. A specialist area of cloud computing is cloud accounting, also referred to as online accounting, being accounting applications accessible through the cloud (Section 2.2).

A number of factors exist with using a modern web based application, a mixture of benefits and concerns. Section 2.3 discussed these, specifically: the ability to access the data from any device or location where there is access to an internet browser (Section 2.3.1); increased security of the data through specialised services and automation (Section 2.3.2); data sharing facilitates integration, the reduction of data entry and increased accuracy (Section 2.3.3); internet connectivity can be an issue, as access to the data is reliant on access (Section 2.3.4); automated updates offer cost savings to users (Section 2.3.5); and SaaS also creates cost savings, eliminating up front capital costs, replacing it with regular fees for the use of the software (Section 2.3.6).

The factors described in Section 2.3 are universal. Section 2.4 highlighted issues in the context of farming. These issues are further addressed in Chapter 4 which explores these issues from the perspective of the case company, CRS Software.
Chapter 3

Method

3.1 Research approach

The research question, *What are the factors and issues encountered by a software development company in their journey from developing desktop software to cloud application software?* requires identification of a software development company that has transformed their software from desktop to cloud application software.

Qualitative research aims to gain an understanding of behaviours, describing variations and experiences (Ang, 2014). In contrast, quantitative research aims to identify a relationship over multiple observations, variations are quantified with numerical analysis (Ang, 2014). The journey of developing online software is the focus of this research. The factors and issues experienced by the company will be best explored through discussions with employees. Thus, a qualitative method is most appropriate for this research.

Qualitative research includes a variety of methods including case study research. Case study research links what is happening for one or more individuals to large-scale social group actions (Neuman, 2011). The approach focuses on “how” or “why,” with little control over outcomes as investigations are in a “real-world context” (Yin, 2014). A single-case study is suitable for a common or typical case where examination of a single business aids understanding the social benefits of new innovations and developments in technology (Yin, 2014). The literature details a number of advantages and concerns that users are faced with in moving to the cloud. Through a single-case study approach these issues will be identified and explored as they are experienced by a local software company.

3.2 Case study selection

The New Zealand software industry is limited with only a few developers providing accounting solutions. The number of developers that have already or are currently in the midst of transforming their product to a cloud based system is even fewer. Previous unpublished research by the author included interviews of local accountants who identified Cashmanager RURAL as a popular software choice for managing farm financial recording and compliance requirements. CRS Software is currently on the journey of transforming their application to the cloud (Section 1.3), an appropriate case study choice for answering the research question proposed. Other possible accounting
software companies were not as well suited as they were not identified by accountants as being widely used by farmers, or their application was originally developed for the cloud and did not experience a transition from desktop.

An existing relationship between CRS Software and Lincoln University facilitated the proposal and acceptance of their participation in this research. CRS Software managing director was contacted to determine interest in participating as the focus of this research. An agreement between CRS Software and Lincoln University was formed including confidentiality and embargo provisions which could be applied if required. Experiences relevant to this research include the preparation and release of the online (hybrid) version, customer acceptance of the new format, and the current planning of a full cloud version.

3.3 Data collection

Data were sought from the following: documentation (press releases, promotional material, company websites, blogs and news items), promotional videos, physical artefacts (accounting software and online help) and semi-structured interviews. Combination of these data types offers triangulation and reliability to the evidence (Yin, 2014) as the data is observed from multiple perspectives (Neuman, 2011).

Semi-structured interviews were the predominant source of data. This format involves the interviewer asking unspecific questions that prompt the interviewee. The questions guide the conversation yet allow the interviewee freedom, and the conversation to flow (Ang, 2014). The questions used to guide the interview are included in Appendix A. As this research is to explore the journey from desktop to online for an accounting software development company, it was desirable to provide opportunity to the interviewee for candour on the topic and possibly discuss related areas that have not been considered by the interviewer.

Employees of the case study company, CRS Software, acting in their various professional capacities (e.g. marketing, software development) were chosen as appropriate interviewees. Individual participants from CRS Software were selected based on their role in the company, and their length of employment. It was desirable to interview members of the company's management team, as their position would entitle them to knowledge critical to understanding the journey from desktop to online. It was expected that they would have an understanding of what changes were planned, why those changes were chosen and impacts on the business as a whole, including customers. Long standing employees of CRS Software will have experienced the changes and growth of the software, the business, and customers. This criteria was shared with a CRS Software administrator who
selected employees to participate in an interview. A total of seven interviews were conducted with
eight employees, representing all aspects of the business: ownership, business management,
marketing, business development, product innovation, software development and customer
services. Interviews were conducted at CRS Software offices in Masterton and lasted 28 to 69
minutes.

All questions were restricted to their role as a professional and so an exemption from application of
approval under section 6.2.3(2) of the Lincoln University Policies and Procedures of the Human Ethics
Committee policy is applicable to this research. The four primary principles of the policy were taken
into account being: informed and voluntary consent; respect for rights of privacy and confidentiality;
limitation of deception; and minimisation of risk.

Participants were provided an information sheet about the research project (included in Appendix
A.2), including the aim of the project, their expected involvement, and that results will be published.
Signed voluntary consent (example form included in Appendix A.3) was obtained before interviews
took place, to ensure the interviewee understood the research project, to seek permission to record
the interview, to provide an opportunity for them to read and amend the interview transcript and to
advise them of their right to withdraw from the research by a specified date if they chose. All
interviews were recorded with permission of the interviewee. Recordings were transcribed, and the
written transcriptions used for analysis. Those participants who wished to be given the opportunity
to review the transcripts were contacted and the transcripts securely delivered to them. No
amendments were advised and no interviewees withdrew from the research.

Privacy and confidentiality is provided to the individuals. Though the case company is identified in
the research, anonymity is given to interviewees and the position they hold in CRS Software. No
personal identifiers are included in the dissertation, instead non-identifying labels P1 to P8 were
assigned to interviewees. The exception is where public media sources are used as a data source,
and details of name and position are made available through that source.

A draft of the completed dissertation was provided to key managers at CRS Software for a final
review as a form of professional courtesy (Yin, 2014) and in line with the agreement with CRS
Software on confidentiality and embargo provisions. This ensures that key findings are not
misrepresented and provides an opportunity for the participants to challenge the findings of the
research. In this process, the robustness and validity of the dissertation is increased (Yin, 2014).
Minor changes were suggested by CRS Software.
3.4 Analysis

The primary source of data is transcripts from audio recordings of interviews. Interviews were coded using a theme coding system as described by Cavana, Delahaye, and Sekaran (2001). This process was completed manually, without the assistance of a computerised research analysis tool.

The first review of the transcripts involved open coding whereby critical themes were identified, and data grouped into preliminary categories (Cavana et al., 2001; Neuman, 2011).

The data was reviewed and re-grouped according to themes using axial coding. The data was re-examined, focused on the themes with a view to identifying sub-themes or to combine themes (Cavana et al., 2001; Neuman, 2011). The list of themes was referred to regularly to ensure that coding remained consistent throughout all of the interview data. This process provided an opportunity to consider the associations between the themes. Other themes were identified as belonging to more than one concept, thus the application of the Venn diagram to the themes.

A final review of the data applied selective coding, identifying sections of the data that illustrated the themes (Neuman, 2011). These sections are included within the discussion in Chapter 4, and the themes included as Appendix B.
Chapter 4
Results and Discussion

4.1 Overview

This chapter presents the results of applying the method in Chapter 3 and then discusses those results and the analysis of them.

Eight employees of CRS Software were interviewed as described in Section 3.3. These employees were employed in a variety of roles with a length of service between one to thirty years with a mean of nine and a median of five years. Semi-structured interviews were conducted, recorded and transcribed. The transcripts were then analysed as described in Section 3.4. Analysis identified the themes in Appendix B. As interview questions evolved from the literature addressing the benefits and concerns of developing cloud accounting applications, many of the codes reflect the themes in the literature.

4.2 Results

The purpose of this research is to answer the question, what are the factors and issues encountered by a software development company in their journey from developing desktop software to cloud application software? The journey is an intermingling of three key components. There is the software application, Cashmanager RURAL, going through a transformation to incorporate modern web based technologies; the business, CRS Software, enacting the changes to their processes; and the customer, farmers, who use the application in their daily farm management decisions. As the software grows and changes, there are implications for the others, the business and the customer. The relationship of the three are reflected in Figure 1, showing that each key component holds individual characteristics, but also inter-relate with the others.
Figure 1 Venn diagram showing the relationship between the key components of the journey of an accounting software company from desktop to online.

The first section (Section 4.3) addresses research objective 1 to identify the benefits and concerns of transforming desktop software to online/cloud. The purpose of the program, Cashmanager RURAL, remains unchanged, “financial software for better farm management” (CRS Software Ltd, 2015b) but CRS Software has embarked on the task to deliver it using modern web based technology. Issues examined include:

- accessibility (Section 4.3.1);
- data security (Section 4.3.2);
- data sharing and consolidated reporting (Section 4.3.3);
- internet connectivity (Section 4.3.4);
- automated updates and version control (Section 4.3.5); and
- Software as a Service (SaaS) (Section 4.3.6).

Section 4.4 looks at the business, CRS Software, and research objective 2 to identify factors affecting the business on their journey to develop online/cloud application. This section considers the effects of this journey to their business strategy (Section 4.4.1) and operational changes (Section 4.4.2) needed to support the transformation of the product.

The third research objective, to identify factors affecting the customers on their transition to using online/cloud applications, is addressed in Section 4.5 customer. CRS Software’s customers, the farmers, are faced with changes to their business management tool, Cashmanager RURAL. Beyond all the benefits and concerns discussed in Section 4.3 of using a modern web based application, they are confronted with change. Some customers whole heartedly embrace modernisation (Section 4.5.1) and others have a reluctance for change (Section 4.5.2).
As shown in Figure 1, the interactions of these sections are discussed in Section 4.6. The *modern web based application and business* inter-relate (Section 4.6.1) through program enhancements and managing subscription fees; *business and customer* (Section 4.6.2) through intellectual property; *customer and modern web based application* (Section 4.6.3) in customer experiences; and finally where all three intersect (Section 4.6.4) via customer support.

### 4.3 Modern web based application

#### 4.3.1 Accessibility

A key benefit to moving to the cloud or creating a modern web based application is to enable the software application to be accessed through an internet browser. “Being in the browser gives us a lot more flexibility and mobility moving forward” (CRS Software Ltd, 2014b). “Being in the browser means that you can access from any computer, anywhere, anytime, any platform” (CRS Software Ltd, 2014b) without the need to install software (Dimitriu & Matei, 2014b). Reliance on mobile devices as a business tool is growing (Cloud Accounting Institute, 2014), in particular the “the growth of the Apple Mac in the business space (driven by iPhone and iPad)” (Baker, 2010, p. 38). CRS Software employees understand that farmers want to choose devices that work best for them. “Farmers love their iPhones! They really do! They spend… a lot of time on them” (P2).

The majority of farming activities occur outside of the office. Farmers tend to spend their days outside on the land, focussing on animal or crop production. Information from Cashmanager RURAL supports informed decision making, but that decision making may need to be deferred until there is access to the program. For locally installed accounting software this could mean waiting until the evening or a quiet day to spend time in the office. With modern web based applications and internet access, a range of mobile digital devices such as laptops, tablets and smart phones carried out to the farming activities, minimises delays in information gathering and decision making. An anywhere, anytime approach increases productivity (Abra, 2015):

> A key [benefit] is the whole area of moving out of the office and into the paddock and so being able to access information on mobile devices. And you really need to be a distributed environment available on any type of device, on any operating system, particularly the mobile devices. Which you can only do if it’s a genuine cloud product, fully distributed environment. (P1)

Some farming operations involve two or more locations and the one database file is needed to be accessed in both locations. This is difficult to achieve with traditional desktop software. Work-around strategies such as taking “a backup from the main computer, restor[ing] it on the second laptop or second computer, and then hav[ing] to do the work, then take it back” (P6), are devised by
users to overcome the limitation. The potential for confusion over which set of data to continue to work on is enormous.

_A lot of them used to traipse around with backups and move them from one computer to the other and get in a dreadful mess frankly of which was the latest correct version of the data._ (P1)

When data is stored in the cloud, there is only one live version of the data. The data remains in the cloud “m[aking] it portable for users over no matter what computer they [are] on, they always [have] the current version of the data” (P1) removing the need for copies of files and work-around strategies.

Typically, a farming operation is supported by a number of advisors and key partners who rely on accounting and budgeting information available in Cashmanager RURAL. The management of a farm and its ownership may be separated. Some farms utilise farm consultants for expert advice in production. Accountants are engaged for taxation and compliance, and bank managers are involved with providing financing. Sharing of information between the farm and the stakeholders is simplified by holding the data in the cloud and allows for easier access to a range of stakeholders by “widening[ing] that loop of who can actually see their data” (P7).

The real advantage of holding data in the cloud is that all participants are able to access the data in real time. There are no delays, and there is only one version that everyone is able to work with. Working collaboratively is made easier as both parties can view up-to-date data at the same time from separate locations (Dimitriu & Matei, 2014a, 2014b, 2015):

_Some people see it as a big advantage, because they... have really [great] relationships with their bank or their accountant and they want to be able to ring them up and say, “I’ve just been working on this budget, and can you just take a look for me, I want to see if that makes sense.”_ (P2)

The database owner, typically the farmer “can actually dictate what sort of access” (P7) or permissions are granted to individuals or organisations. Access may be set to all or separate areas of the software, and may allow a user to edit and add data, or read only (CRS Software Ltd, n.d.-a).

The increased ability to access data by the farmer and others supporting the farm operations is advantageous to timely decision making. It also offers a safety net where a device has been damaged or stolen. The only loss is the device itself, not the data as the user can easily gain access from another device (Abra, 2015).
4.3.2 Data security

A key consideration in transforming from desktop to cloud is data security (CCH, 2013; Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014a, 2014b) with some clients “afraid of someone being able to access their data” (P6) forming a barrier to adopting cloud computing solutions (Dimitriu & Matei, 2014a; Ernst & Young, 2011). CRS Software employees have experienced a similar reaction from their customers:

They hate the idea that they [might] be hacked. Like that’s kind of scary when you hear about… [a different accounting software developer who] got hacked. (P2)

CRS Software “relies on its ability to keep that data safe and our security is as good, if not better than most banks” (P6) so it is critical to defend against unauthorised access, information theft and computer hacking (Dimitriu & Matei, 2014a, 2014b). To not take these concerns seriously would be detrimental to their reputation, “our business is on the line” (P6), a view echoed by Cloud Accounting Institute (2014).

CRS Software implemented changes when going from desktop to cloud to protect data, “large amounts of data that’s not our own that we have to be custodian for” (P1). Changes included automated backup procedures, security protocols, disaster recovery plans and physical barriers “like even entry into the building for example, the secure area and all those sorts of things and processes that go with that” (P1). These are overseen by specialist security administration team members who provide a level of security that would be unaffordable to many users if they implemented it in-house (Cloud Accounting Institute, 2014; Dimitriu & Matei, 2014a, 2014b; Ernst & Young, 2011).

CRS Software’s backups and security include routinely, automated processes that make copies of the data and store them for a set period of time in various locations throughout the world providing assurance against a local disaster such as flood or earthquake (P3).

Security concerns are not just limited to accounting software. There are many business processes that involve accessing data through the internet including email, online banking and online shopping. A reluctance to embrace modern web based applications not only prevents CRS Software customers from the benefits of their specialist farm accounting software, but also impacts their ability to conduct business in a modern world. CRS Software employees work to alleviate customer concerns, but appreciate that it is a team effort in the business community to change these attitudes, for example “banks want them to do internet banking” (P3).
Some attitudes are more prevalent with certain age groups. Younger generations of farmers have experienced the internet nearly their entire lives (P2), and so the benefits of incorporating it into farm business activities is more obvious to this age group.

I think that our older clients that are reaching the mature stages of their business and thinking about their retirement in the future, will find they’re less inclined to rush headlong into technology. (P5)

Cashmanager RURAL have experienced the benefits of data located in the cloud through customer support. With a locally installed application, “some [customers] even had quite good backup strategies but they still lost everything… the computer was crashing, or the house burnt down or the house flooded… they not only lost their current data, they lost all their backups as well” (P1). This is significantly changed as “nobody who’s in the online world has lost their data” (P1) as recovery of data stored in the cloud can be effortlessly restored for the farmer.

Ownership of the data and the sense of loss of control may be other security issues concerning farmers (Dimitriu & Matei, 2014a, 2014b; Ernst & Young, 2011). When the data is no longer physically in the presence of the farmer, there is an element of uncertainty. Who owns the data? Who is entitled to see the data? As highlighted by (P3):

We have our [policy] that we can talk about, and we point to our privacy policy [on the web]. As far as what we will and won’t do… where we store it… reassuring them that it doesn’t go to anyone unless it has their permission… If we have an integration with FarmIQ, and they want us to send the data, then we will, but we don’t just send it out to people [without permission].

“The data belongs to the person who pays the bill basically, which is the farmer” (P2). The Cashmanager ONLINE Terms of Use clearly states “we do not own Account Data” (CRS Software Ltd, 2014a, p. 3).

Security of data is paramount to both farmer and CRS Software. CRS Software has processes in place to protect data, and works with clients to assure them of the benefits of using online programs with data located in the cloud and the efforts made to minimise any risks.

4.3.3 Data sharing and consolidated reporting

When data is located where it is easily accessible, for example the cloud, it opens opportunities to share the data as discussed in Section 4.3.1, such as sharing the one data file with the team managing that business. This concept is further expanded to consider retrieving external data relevant to the business and consolidating and comparing data to other businesses.
**Data sharing**

Data sharing is particularly powerful when it is used to gather information that may have been captured by another business or computer application, and then fed into Cashmanager RURAL. The greatest example of this is bank feeds, where bank transactions normally provided in paper statement form to customers who had to manually enter them, are instead automatically fed into Cashmanager RURAL. The program’s support website explains that “bank feeds are a secure connection straight to your bank that allow transactions to arrive into your Cashmanager RURAL farm business automatically” (CRS Software Ltd, n.d.-b).

This “means that you always have a complete and up to date view of your business” (CRS Software Ltd, n.d.-b) and there is a time savings for the farmer as the data is already entered into the program. Compare this with the desktop program, where the data needed to be keyed in by the farmer. This also adds controls on completeness and correctness of information as CRS customer Mel explains (CRS Software Ltd, 2015a):

> I would often make mistakes entering the data. Now, with the click of a button, my bank statements are imported directly from my bank into my Cashmanager RURAL. It’s quick, easy and hassle free. It also gives me greater confidence because I know the data is accurate.

When data is entered manually, there is a possibility that amounts are entered incorrectly or not included. The automated transfer of data removes the chances of this happening.

Given the success of bank feeds, “via the web we are going to be expanding to all banks, traders and rural suppliers”(CRS Software Ltd, 2014b). As it is common for farmers to belong to a trading company such as Farmlands, where purchases and sales are traded through one account, relationships with these companies have also been established “and transactions are just going to arrive to be automatically coded and ready for use and planning” (CRS Software Ltd, 2014b).

To compliment this, payments can be set up with Cashmanager RURAL, and then exported to the bank. Like bank feeds, this has all the benefits of time saving and improving accuracy as payments are only created once in Cashmanager RURAL, and not needed to be duplicated in online banking (CRS Software Ltd, 2015a).

New functionality is being introduced which enables bills or documents from suppliers to be loaded into Cashmanager RURAL. This automates the process of creating a transaction (CRS Software Ltd, 2016). With the growth of e-commerce and electronic transactions (Allen & Wolfert, 2011), the usefulness of this feature will only increase as “the accountant can actually get on with what should be a time and cost saver for the farmer” (P6).
Dairy Forecaster interacts with budgets in Cashmanager RURAL and “imports automated Fonterra prices” (P7) and updates from the major dairy companies. Dairy farmers use this feature to forecast cash available based on production. As milk revenue is based on current prices, accuracy of the forecast is increased.

Farmers may also use other computerised tools to assist them in production and planning. Cashmanager RURAL focuses on the financial aspects, but “the ability to exchange data with other organisations, it might be Farmax, it might be FarmIQ” (P1) offer benefits with production planning, which then result in a financial benefit. Being able to share information between tools adds real value and time saving to farmers. Differences in the way in which the programs operate, affects the ability to share with ease, “unless you all have the same platform, the same version, you just can’t do any of that. So that’s why it’s critical that the rest of the industry is also in the cloud, operating the latest version of the data [where] there’s only one form of that data” (P1).

Further ease of sharing data is enabled in modern web based applications with the use of APIs (application program interfaces). This is an agreement for how information can be passed between applications and, opens up opportunities for sharing data, “we just say, this is how it works, feed the data in to make sure it matches” (P2). Information presented to farmers is enhanced, a possible customisation suggested by (P8):

> You can take say a dashboard, a farmer might want to put the grass growth and weather information, soil moisture, against their cash flow and profitability. So the dashboard can use our API to get the cash flow and information like that. Or production, pay out. And then on the other side, they can go to FarmIQ or some other web service and use their APIs to pull in other information. Bring it together and then present decisions, support information for farmers.

Allen and Wolfert (2011) expressed concerns on the lack of integration in software available to New Zealand farmers. Utilising APIs will enable this to be remedied.

Consolidating reporting
Sometimes the external information is already in Cashmanager RURAL, just in a different database. In particular where one business owns multiple farms, each farm will manage its own database, but for planning and forecasting it is important to base plans on the whole group. Bringing together the data into one view is a recent feature offered by Cashmanager RURAL which is only been made possible through holding data in the cloud. Brian Eccles, CRS Software managing director talked with Rural News Group (2015) about one customer who will benefit from this feature:

> A South Waikato farmer with 12 dairy farms around New Zealand who has been trying to manually consolidate all this information on a regular basis.
When shown the new CRS software system for consolidated reporting, ‘his eyes just popped out, he was delighted, it solved a real problem for him,’ says Eccles. ‘He spent hours every month doing this; I said just press the button and it’s done. It’s going to make it so much easier for him.’

The current range of consolidated reports show “bank balance... across your large farm portfolio, financial performance across all properties, [and a] monthly consolidated cash flow” (CRS Software Ltd, 2014b). This information is critical to managing the group as a whole and supports better decision making.

Benchmarking similarly presents information for more than one farm, but is used for comparative purposes. The information may present one farm compared to another, a group of farms or the industry standard. Where information is accessible, via data stored in the cloud, barriers are removed and comparisons can be made. Being able to benchmark easily adds value to the farmer.

**Overall**

Data sharing between applications and other databases “take away that manual overhead and transaction handling work” (CRS Software Ltd, 2014b), the drudgery of data entry. Time is freed, to focus on “value based discussions about growing your business, setting a plan [and] reaching that plan” (CRS Software Ltd, 2014b) as recognised in the literature (Dimitriu & Matei, 2015). A CRS Software employee shares their view on how this functionality benefits the farmer:

> They can get a lot more information that’s a whole lot less manually provided. Which means that there’s less room for error. But also to, potentially it gets any compliance work done very very quickly and out of the way. Because at the end of the day that’s the $20 an hour job. And it gives them the time and or the tools and the information that has been brought in for compliance. It’s all available there for them to sit down and work on their budgeting which is the $200 an hour work. (P7)

Locally installed accounting programs are not able to offer that level of integration. Data is isolated and does not easily support interactions with other sources of information to a level that provide significant benefits to users. “This is where cloud software generally is, by and large, focused on letting people be consumers of information rather than gatherers of information.” (P1) Studies by Allen and Wolfert (2011) and Cloud Accounting Institute (2014) identifies that farmers and users are looking for higher levels of integration of data between sources.

**4.3.4 Internet connectivity**

Using an application where data is stored in the cloud, requires internet connectivity to access the data, and for modern web based applications the internet is also needed to gain access to programs. For many rural areas, this has been a long standing issue, as the availability of internet is less than in urban areas, or may involve high costs to achieve an acceptable bandwidth and latency. Internet
access may be available through a telephone landline connection to the house, but does not extend to the sheep yards or dairy shed. Areas where there is no cell phone reception increase the farther the distance from the cell phone tower, so the benefits of portability in a modern web based application are reduced. Where there is no internet access, the farmer cannot use the program.

The need for being connected to the internet offers other benefits in addition to being able to run Cashmanager RURAL. “People see it as so essential, not just to run their accounting software, but actually to run their business” (P2). For email, online banking, online GST and employer compliance, and contact with suppliers and customers. Industry tools and information available online are additional benefit of using the internet. For example Farm Source and Fencepost (P3) offer dairy farmers belonging to Fonterra Co-operative Group information on individual farm production, information on the co-operative, and industry events, (New Zealand Farm Source & Fonterra Co-operative Group, 2014). Farms who are unable to use these to their advantage will struggle to compete in the modern business world. Additionally there are personal benefits, “they want their kids to be connected for their education” (P2), for social media, email, internet searches and those portals for bringing the world closer when the farm is physically remote, “they want to Skype the grandchildren” (P3). For these reasons, CRS Software managers believe that farmers will seek out internet access, “there are options, it’s whether people are motivated enough to do something about it” (P2).

The improvements to internet connectivity “over the last 5 years... [has] just changed immensely” (P2), but in some rural areas, there is still work to be done, “we’ve actually got an employee here... she can’t get an internet connection at home, and nor can she get cell phone reception” (P4). In a joint program, the Rural Broadband Initiative, the New Zealand government and telecommunications companies are addressing the connectivity issue in rural New Zealand (Ministry of Business Innovation & Employment, 2015). Progress is steady, “even another year will make a big difference” (P2), but it requires time and resources:

_They’ve got high speed broadband at 50 or 60% of the market... The next lot of investment will pick up the next 10 to 15%, so the government’s going to put another lot of money in. But then after that, it starts getting harder and harder and harder, because it’s more and more remote. (P2)_.

While improvements to the overall telecommunications issue are being addressed at higher levels, CRS Software have planned and been “very careful in the design... because we knew our customer base ha[s] poor connectivity issues” (P1), accommodating low bandwidth and high latency with the online version of Cashmanager RURAL. The result has been positive, “we [have] ended up with a design that had very, very good performance levels... people have been delighted with the online experience, of our online product” (P1).
Internet connectivity continues to be an issue for farmers (Allen & Wolfert, 2011) but will improve with lobbying to internet providers and the government. The Rural Broadband Initiative is reacting to the pressures and working towards providing better services. Software application providers may also participate and take the challenge to improve the architecture of their product (Dimitriu & Matei, 2014b) to accommodate these issues in the meantime, just as CRS Software has.

4.3.5 Automated updates and version control

Modern web based applications eliminate the need to manually install updates. Where the application is accessed through the web browser, the software development business is in control of the program, and completing the update themselves, “deploy[ing] the changes to our website without any disruption to any clients what so ever” (CRS Software Ltd, 2014b). Any changes to the program will just appear the next time the user logs in. There are no time delays, “we can go from a whiteboard session in a concept to product design and wire framing and testing and verification all in a period of a few weeks” (CRS Software Ltd, 2014b). With fewer overheads in updating the application, changes are more frequent, “new feature[s]... [are] immediately available for users” (P8), and everyone will be using the latest version (Dimitriu & Matei, 2015).

Compare this with locally installed accounting applications. Updates need to be physically installed by the user, on each individual computer used. For busy farmers, invariably this task would be postponed until later, or with more technically challenged users, a technician hired to complete the upgrade resulting in monetary costs as well as time costs. Additionally, at any one time, multiple versions of Cashmanager RURAL may be in use introducing problems in sharing data and creating challenges for the CRS Software customer support team. For example, a farmer and his accountant would need to both have the same version of Cashmanager RURAL in order to share the data file, “unless you all have the same platform, the same version, you just can’t do any of that” (P1).

CRS Software also incurs costs in preparing desktop releases, “the overhead involved in testing, building install files and distributing them out to people... all of that makes it very costly to do a release” (P8). Testing needs to be thorough to ensure that the program will work on a variety of operating systems and computers, “dealing with all of the issues that you have when they have different versions of Windows” (P8), and takes time. For these reasons, upgrades for the desktop version of Cashmanager RURAL are not frequent as “more than a yearly upgrade doesn’t appeal too much” (P8), and farmers may be frustrated waiting for changes and improvements. The process is particularly disastrous if errors are inadvertently introduced by the release.

A further benefit of using modern web based applications is that analytics can be collected on how farmers use the new features. Testing is more precise and controlled, “we can release new features
for a subset of the user base and we can compare any outcomes” (P8). Any changes implemented will be chosen on their merit, “we can direct our product strategy based upon real feedback from the market” (P8). In this way, users actively shape the direction of the program.

Releases in a modern web based application offer savings in time and money to farmers, as well as to CRS Software. Problems in accessibility or sharing data are minimised, as everyone works from the same current version.

4.3.6 Software as a Service (SaaS)

The transformation of a program from desktop to online also changes the essence of the service the customer is purchasing from the business. CRS Software “moved from effectively a shrink wrapped desktop organisation... to an online and cloud software as a service [SaaS] type of organisation” (P1) and as a result the “licencing structure... is much more a lease” (P1). Annual subscription fees are “pa[id] per database” (P6) and services provided to customers include access to the program, program updates, securely held data in the cloud, and customer support. An added benefit is that an annual licence ensures that everyone is on the most recent version of the product (P1), ensuring version control (Section 4.3.5).

The desktop version sold prior to 2000, “was licenced on a perpetual licence, so you didn’t know how many databases they had or who was using it” (P6). The one fee was used indefinitely for multiple farms, or “they might have had the school, or the pony club” (P6) databases. The increase in fee structures can be significant for these “legacy [databases]” (P3) causing some resistance to moving. For others, they “are just resistant to the idea of a subscription because you’re tied into it permanently” (P2). When the subscription is no longer paid, the farmer loses access to his data, so this suggests that farmers feel compelled to use Cashmanager RURAL forever.

Determining a fair price for SaaS can be challenging. Four years ago, the online product “was almost double” (P2) compared to the price of the desktop version which created resistance to customers moving to online (P2). Currently there is price parity between the products, an encouragement for customers sensitive to price “we just say ‘do you realise that there is no additional cost to go online?’ and they move” (P3). Given that CRS Software “virtually get[s] no” (P1) negative attitudes towards pricing suggests that the product is competitively priced. “The market is aware of what sort of... annual fees a product like this would cost” (P1) and the savings available to customers as they no longer have an initial capital investment to purchase the software (Abra, 2015; Brandas et al., 2015; Dimitriu & Matei, 2014a, 2015, n.d.; Ernst & Young, 2011).
4.4 Business

CRS Software has made a number of changes on its journey from desktop to online, not just to the product delivered to the farmers, but to the business itself. Changes to the long term strategy and direction of CRS Software (Section 4.4.1) have occurred, as well as operational changes, such as staff numbers and office size discussed in Section 4.4.2. “If you’d seen this business [prior to online], it’s a completely different business” (P3). This section discusses how moving to a cloud accounting program has affected the case company from a business perspective.

4.4.1 Business strategy

CRS Software is “all about the farmer and making sure the farmer can manage their business” (P3). They are mindful that many accounting programs are created to simplify the accounting and compliance requirements, as directed by accountants. This partnership with farmers is their point of difference in the accounting software industry and CRS Software managing director discusses it with Rural News Group (2015):

_Eccles says he has a good idea what farmers want and need. Having no background himself in either software or accounting “has been good because it has kept my focus about what farmers want and not what accountants want, and they are very different. “I love working with farmers and understanding what they need – anything we can do to help them._

In other media releases, Eccles shares the company vision, and ways in which Cashmanager RURAL benefits farmers and supports decision making on their properties (Rural News Group, 2014; Tipa, 2014):

_Our vision is to provide farmers with software tools that assist day to day management, including physical and financial indicators while supporting the big picture plan... Armed with good information, farmers are better equipped to deal with highly variable seasonal and economic conditions._

Information is core to sound decision making, and employees at CRS Software pride themselves on delivering to farmers the information that the farmers want and need to be able manage their businesses successfully. They can see changes in the way that farmers want this information delivered. “A big shift [is] about to happen. [In the] next five years you’ll see a big increase in computer literacy amongst the farmer decision makers” (P1). CRS Software has to adapt too, “the world’s moved on, so we have to move with it” (P3).

Listening to their customers, CRS Software’s strategy integrated “modernisation [and] moving to the cloud, so that we can address this need of any device, anywhere, which is a growing want amongst our farming community” (CRS Software Ltd, 2014c). The online version offers “centralised data and the connectivity for the clients” (P1), which inherently changed the program to a SaaS model focused
on a providing a service in contrast to selling a product (Section 4.3.6). “An impediment to that was that the licencing structure needed to change... moving it to an annual licence” (P1) from the previous perpetual licence structure.

The journey continues, “the web browser is where we are going” (CRS Software Ltd, 2014b), harnessing all of the benefits of a modern web based application. The development of the application includes opportunity for re-addressing the question “what do farmers need going into the future for a business management tool?” (P3). CRS Software continues to incorporate the farmer into their strategy. Using new web technology, “it’s really just about future proofing the product” (P1) so that it continues to serve the needs of the modern farmer.

The way that CRS Software specifically addressed poor connectivity issues (Section 4.3.4) in the design of the online version is an example of how their strategy is inter woven with the needs of the farmer. They admit that some of the changes may have taken longer than desirable, “but it’s really important to get it right... if we had of gone ahead... and built what we first thought... it wouldn’t have worked for the farmer” (P3). Careful planning and strategy, balancing the needs of the farmer and moving into the future, is critical to protecting the future of the Cashmanager RURAL brand.

Long term decisions will need to be made around matters such as the delivery of information and support to farmers, future of the desktop software, proposed enhancements to the software, and communicating these issues to farmers. These demonstrate how business strategy is impacted by the decision to provide modern web based applications.

In the modern environment, functionality can be built into the product to guide the farmer through the tasks with videos and information, “I can see you are trying to such and such, there’s a video here” (P3). This functionality “encourag[es] customers to go and find the information themselves” (P5) eliminating some of the relationship currently held between farmers and the CRS Software support team. An opportunity is created for some team members to be redirected to other productive areas of the business but this decision needs to be balanced with the views of customers who may value personal contact with customer support.

The future of the desktop software is another area for consideration. Some farmers are making the choice to stay on a desktop version, reluctant to move with the changing technology (Section 4.5.2). Continuing to provide support services for these customers financially impacts CRS Software:

_We have to maintain resources for old technology... We're now up skilling in modern web based technologies with different people with different skill sets. Ideally, we wouldn't have to maintain both for indefinitely._ (P8)
If customers are still actively using the software, CRS Software management acknowledges “we’re obliged to support it” (P8), but the question is for how long is this practical? At some point CRS Software may decide to discontinue support for desktop, negatively affecting a small group of long-time customers.

Prioritising features before a release requires an element of strategy. Features need to be weighed against each other and questioned “if we include this feature, it’s going to take more time. Is there something else which is more important that we get in first?” (P8). It is desirable to release “as early as can be achieved, but at the same time not compromising on the core of the application” (P8). There are basic requirements that need to be met that are associated with being a modern web based application, for example security, backups and program stability. “If it doesn’t break, it’s not slow, it doesn’t fall over or have bugs” (P8), then development can focus on other features that are differentiators or provide competitive advantage for the application (P8).

Lastly, strategic decisions over timing of releasing public information on any of these examples. Providing details to farmers creates interest, support and positive publicity for the business, therefore it is desirable to share details early. Yet creating public expectations by announcing too far in advance of the changes gives “the perception... [that] you’re being extremely slow” (P2). Knowing when to inform customers is important to maintain good public relations. CRS Software employees take pride themselves in not making promises to the farmers “until we know we’ve got a good solid product sitting behind that promise... so it keeps our name as a good product.” (P7).

4.4.2 Operational changes

The strategic decision to move Cashmanager RURAL to online had obvious implications on the technical tools and skills necessary to develop applications for cloud. However, CRS Software management “grossly underestimated” (P1) the resulting impact on other aspects of the business, the “shift in culture, systems, processes and cost of servicing” (P1) the new application. The transformation from “effectively a shrink wrapped desktop organisation” (P1) to a SaaS business model affected the “whole business side of things... right from governance right through the organisation right down to a very operational level” (P1).

With the decision to redirect development towards modern technologies, the need arose for new expertise. CRS Software “needed to bring in new skills, and the old skills aren’t needed as much” (P1). It is a matter of balancing the knowledge base in the modern technologies and retaining the expertise of those who understand the core functions of Cashmanager RURAL, “you don’t want to lose people who know your product” (P3). CRS Software managed this transition of the development team over time through “buil[ding] their knowledge of the new technologies and then [bringing] in
some expertise over top” (P3). In the last four years, the development team has more than tripled in size, some of the roles are more defined and specialised than what was previously held with a smaller team (P3). The new approach is more design driven with feedback from customers through “workshops with farmers” (P3) providing an opportunity for the development team to observe farmers “actually us[ing] it and see[ing] whether [it is easy to navigate]” (P3). The message to Road Show attendees supports the commitment to this approach (CRS Software Ltd, 2014b):

*We’ve engaged top notch experts in the field of usability and UX [user experience] engineering to help us with that user centric design and focus.*

To accommodate the growing number of staff, new offices were built in Masterton with additional capacity in August 2014 (Rural News Group, 2014; Tipa, 2014). Another small team currently occupies leased space 100 km away in Wellington, opened “because we needed the extra resource” (P3) and skills that could not be found in Masterton. The “ab[ility] to scale the Wellington office a lot faster than... in Masterton” (P3) enables CRS Software to quickly react to their changing needs.

As discussed in Section 4.3.6, providing software as an online service prompted the need to change from a “perpetual licence to... an annual licence” (P1) whereby the software “has to be licenced to operate” (P1). Changes in “accounting and operational processes” (P1) were necessary to implement the annual licence including upgrades to CRM (customer relationship management) systems “so that we knew exactly whose license was current and whose wasn’t” (P1). As Cashmanager RURAL continues to integrate more of the modern web based technologies, additional data sharing functionality will be applied to automate and improve subscription processes: “we [still] have [some] manual processes behind the scenes.” (P3). Reducing the manual administrative processes provides opportunity for CRS Software to monitor their own business performance (P3). Questions they ask of themselves include:

*What do software as a service subscription businesses... measure? What are the metrics? What are the benchmarks? What does a software as a service business look like, and how do we compare?* (P3)

Moving to a modern web based application enables the business to gather information and examine themselves, providing an opportunity to make informed business decisions. This mirrors the functionality that CRS Software provides to its own customers through Cashmanager RURAL.

The customer support team were impacted with the changes in subscription. If the “licence isn’t updated then people’s service stops” (P1) prompting customer contact with CRS Software. It “could create a huge overhead of support calls and service straight away” (P1), overwhelming staff. Access is dependent on accuracy of the CRM system, so automating these processes will have a positive effect on customer support.
In a similar fashion, new releases may burden customer support with “thousands of phone calls from customers who are asking what the story is” (P5). Management acknowledges how critical preparation is and the need to “do as much preplanning as possible” (P5). The result of doing this poorly will “end up with a big spike in stressful activity for customer support” (P5). Some of this is achieved through help information in the product “as it has it all built in and it guides [the user]” (P3). Current customer support addresses “how do I...?” (P3) questions from farmers, but incorporating more how-to assistance into the program enables users to answer this for themselves. CRS Software “resources can be turned around to be doing things proactively and adding value” (P3) where it is envisioned that “jobs [in customer services] are going to be far more satisfying” (P3) and CRS Software culture remains positive.

4.5 Customer

While transforming their software from desktop to online CRS Software employees have noted varying reactions from different customer groups, ranging from early adopters who are keen to implement the latest technology into their business, to customers reluctant to make any changes at all. It is the “spectrum of change” (P1) as “each customer is quite different” (P6) with varying degrees in attitudes of farmers to the adoption of technology in their farming practices. This section considers the two extremes. Section 4.5.1 looks at customers that embrace changes in technology and are eager for modernisation and the advantages that it offers. The second group have a reluctance for change for a variety of reasons, are discussed in Section 4.5.2.

The customer (i.e. the farmer) is discussed from CRS Software’s perspective. They have observed the speed and numbers of farmers that have moved to the online version from desktop. The opinions of CRS Software employees will also factor in the many interactions they have with farmers through customer support, focus groups, surveys, social media, trade shows and roadshow presentations.

4.5.1 Modernisation embraced

Moving or transferring customers to the online version of Cashmanager RURAL is straight forward for those who embrace modernisation. “Innovators and early adopters accepted it very keenly, very willingly” (P1). This group of farmers understands benefits associated with holding data online, in particular the advantages of accessibility (refer to Section 4.3.1). “The first lot that moved, it was actually sharing their information with the accountant or their stakeholders” (P3). They are “always looking for an advantage” (P2), and “just want to see what it does better for me, [what] can I get out of it?” (P5). The benefits of bank feeds and other forms of data sharing (Section 4.3.3) saw “another
push” (P3) of farmers transferring to online. These farmers “go hunting for that opportunity” (P5) and readily see the advantages to modernisation.

Some of these attitudes may be explained by this observation from a manager at CRS Software:

> My generation grew up with computers. We were learning about them through high school and we’ve grown up with them. The next generation has grown up with them in their pocket. And so the expectation that I should be able to connect with whatever I need to connect with, wherever I am, is extremely high, particularly in anybody under 40. (P2)

The younger generations of farmers will see the advantages of technology in their farm management because they have used technology in numerous areas of their lives. This is supported in the literature showing increased uptake levels in this age group over older business owners (Baker, 2010; CCH, 2013; Dimitriu & Matei, 2014a). So “a lot of the younger people certainly expect it to be available on any machine, anywhere, at any time” (P1). They are pushing CRS Software to continue their innovations in the modern web based technology with “queries all the time... Are you web based yet? Have you got the mobile application? I want to use it on my Mac. I want to use it on my tablet, my iPhone” (P6). As this generation matures, sections of the farming community incorporating technology in their decision making will grow. In the “next five years you’ll see a big increase in computer literacy amongst the farmer decision makers because that’s just natural to them” (P1). Some of the changes in the way farmers are using technology are (CRS Software Ltd, 2014b):

> Farmers are increasingly doing their banking online. They are walking around the farm with... [a cell phone]. They’re referring to reports and digital dashboards in the milking shed, out in the farm, on a portable device. They are increasingly using automated data collection tools in the paddocks, in the yards.

CRS Software see that they “need to be able to meet the requirements” (P1) and they “have a very ambitious set of projects ahead of [them] to bring that functionality into the browser” (CRS Software Ltd, 2014b).

### 4.5.2 Reluctance for change

Farmers who are reluctant to change the technology they use, are unwilling for many reasons, “so it’s getting to know the client... and then building on that to get to a place to move on” (P6). Some of the reasons have included: “where they are at in their farming career” (P6); “willingness to change and hav[ing] to learn something different” (P1); “some haven’t realised the advantages yet” (P3); and “fear of change” (P8). For all of these reasons, the additional financial costs of moving from desktop
to online may be a barrier deterring customers from moving to online, and is discussed in Section 4.3.6.

Farmers who have used Cashmanager RURAL for a number of years may be in the position that they “don’t want to change because they’re so close to stopping farming or retiring” (P6). If they only see themselves as farming for another few years, they will be reluctant to invest time and money into changes that they may not see any benefits from. They may continue as they have been in the past or disengage and “wind down” (P5). Keeping status quo with the desktop version requires little effort as they already know and understand it, plus there are no additional costs. Alternatively, a step towards retirement may be to involve the services of others, “just let the accountant complete it,” (P5) and only focus on “compliance and end of year” (P5).

A reluctance to change may come about “because what [farmers] are worried about is the time that it might take to learn a new product” (P2), and is reflected by Allen and Wolfert (2011). Time needs to be committed to setting up the new Cashmanager RURAL, to transfer data, to learn how to complete previous tasks in the new setting, and the new tools and functions that the updated program offers. “Forty year old farmers tend to tell us that they are all time-poor, so anything we can do to give them some time back, is going to have a positive difference” (P5). The management at CRS Software are conscientious of this factor and “try to take away as much of their overhead” in the transfer process, but it will always involve an element of time, “there is always going to be a learning overhead” (P2).

Time savings can be realised by moving to the cloud version. Section 4.3 discusses many of these benefits, and with a little investment of time to make the transfer, the farmer will be rewarded with increased efficiencies and meaningful information. CRS Software have to “show them how easy it is, and why they get a lot more value by moving” (P3). Once a farmer starts to see how the online version can benefit his own personal situation, barriers are removed.

They tend to see themselves as not sharing with anybody. Then you say to them “how do you share your information with the accountant?” “Oh, I send them a backup.” They are sharing information, but in a very crude way. (P1)

In this example, a barrier existed because the farmer did not see himself as sharing data, so could not perceive how the moving to the online version would be of benefit.

Innovative farmers (Section 4.5.1) can be persuasive with users concerned with time and lack of understanding the benefits. Management at CRS Software view them as their “biggest influence” and value “getting those early adopters really powered up to spread the word for us” (P2).
We had one [farmer who was having a text message conversation with another farmer who] said... “Oh, I’m just signing up to Cashmanager RURAL.” And the other one said “You are just signing up to Cashmanager RURAL? What kind of farmer are you?” [emphasis added] (P3)

I’m talking to... [a] group of three customers... she’s telling me how she’s online. The women next to her, obviously quite good friends, says “yeah, I haven’t moved online yet.” And she went “Oh my god! Why haven’t you done it?” She says “I don’t know.” “That’s just crazy! We’ll get you organised and move you over!” (P2)

Farmers who are reluctant to change can be influenced by peers who are more confident with technology, and once they experience it for themselves, they understand what they had been missing out on – sharing the budget with the bank manager can speed the process for approval on the bank overdraft, or simplifying the delivery of year end information to the accountant (P2). “It’s only the experience of it that will actually change people’s perceptions and why there are some advantages” (P2).

For others, the fear of change is enormous. They do not have understanding or confidence in the processes set in place to protect them and their data (Dimitriu & Matei, 2015).

Some of them don’t trust the internet. Some of them don’t trust that it will be secure, they don’t trust [that others] won’t get it, you know, they just don’t trust it. (P3)

Moving customers past this fear is delicate, and sometimes unachievable with the message to CRS Software being “I don’t feel safe you having it and I just want it on my computer” (P4). CRS Software employees work with customers “helping them to understand that change is okay and that we’ll help them and support them in that change as well” (P7). For some clients, this assistance is what they need to remove their reluctant and move online, but it does not work with all farmers “some just don’t cope” (P7).

4.6 Inter-relationships

The previous three sections discussed the key components of the journey from desktop to online, namely modern web based application, business and customer, as separate topics. In practice, each of the key components intersect with the others as shown by the Venn diagram in Figure 1. The following sections discuss these inter-relationships.
4.6.1 Modern web based application and business

Program enhancements
Data located in the cloud enables the sharing of data. The customer data is also made available to the business, CRS Software. Confidentiality and security prevents use of the actual financial data, but it provides an opportunity for CRS Software to gather informatics on usage of various parts of the application, “you can work out what features people are using, what the uptake is, whether different features are being used more or less over time” (P8). This provides direction to CRS Software on areas of the program to improve.

Managing subscription fees
Data sharing is also made available between Cashmanager RURAL customer data in the cloud and CRS Software customer subscription data. “The product’s going to be integrated into... our ERP [enterprise resource planning] system” (P3) which is going to be an advantage for managing farmers’ subscriptions and payments for the use of Cashmanager RURAL. Invoicing to farmers will be automated and it’s “going to take away a lot of the manual work” (P3).

4.6.2 Business and customer
The inter-relationships between business and customer can be explained by intellectual property (IP), which is the core of what the business is working towards. Creating a unique product that is valued by its customers and the reason why it is chosen over other products. Many competitors will also offer cloud solutions, with all the functionality discussed in Section 4.3, IP is the functionality over and above what moving to the cloud offers. Introducing modern web based technologies does not affect IP, “it’s just the way that we are servicing it, delivering it” (P5).

For CRS Software, their core IP “is largely planning an actionable decision making for farmers. So it’s not about GST, compliance, reporting and cashbooks” (P8). It is providing a tool for farmers so that they can “understand their business, what it looks like, and how and when they make changes, what it does to their profitability and cash flow which includes their livestock” (P3). Though it is an accounting tool, Cashmanager RURAL differentiates itself from competing products “because normal accounting software doesn’t work well for farms... Whether it is a dairy farm or a sheep and beef farm, the way their finances operate is quite different” (Rural News Group, 2015). CRS Software holds a very high market share in the farming sector (Rural News Group, 2015) “because we are focused on the farmer, and therefore it gives the farmer the information they need as opposed to the accountant” (P3), and this focus gives them that competitive edge.
4.6.3 Customer and modern web based application

Customers need to experience benefits of modern web based applications to embrace modernisation, and remove reluctance “because you don’t understand what connectivity means until you actually experience it” (P2). CRS Software employees have experienced the reactions of customers:

“We’ll say ‘look you can share your information with your banker and your accountant and your consultant’ and they’re like ‘Oh, yeah, okay. I kind of get that.’ And then you’ll have a conversation with them later and ‘Oh! So fantastic! I was able to give the bank manager access to the budget and it just meant that the overdraft got approved a bit faster.’ Or ‘I’ve given the accountant access to the end of year accounts, and I didn’t have to send in the… data, I didn’t have to put it on a stick and put it in the mail.’” (P2)

The customer listens to the explanation of the benefits, but real enlightenment does not occur until they actually experience the benefits, “chang[ing] people’s perceptions” (P2) on moving to a modern web based application.

4.6.4 Modern web based application and business and customer

Customer support is the front line of the company. This is the team that is in contact with customers the most and a key element in the relationship between business and customer (Baker, 2010). They work with customers regarding a variety of issues, thus an inter-relationship between the key components of modern web based application (Section 4.3), business (Section 4.4) and customer (Section 4.5). Calls are logged (P5), and the team answers questions for both online and desktop versions (P2).

When desktop customers contact the team, customer support staff “are really good about talking to customers about the benefits” (P2) of moving online. The team are able to discuss any concerns customers may have about the online version:

[We] have our little spiel that we can talk about, and we point to our privacy policy. As far as what we will and won’t do, when we tell them. Where we store it. And reassure them that it doesn’t go to anyone unless it has their permission. (P3)

If the farmer is agreeable to transferring “they help them with the process of moving online” (P7).

Licencing and new releases have the potential for a surge in customer problems that CRS Software aim to minimise. “If that licence isn’t updated then people’s service stops… and could create a huge overhead of support calls and service straight away” (P1). With new releases, CRS Software “ha[s] to do as much preplanning as possible… [otherwise] we’ll end up with a big spike in stressful activity for customer support” (P5).
Backups of data for the online application are available through the support team (P3), who then restore them online. CRS Software “have desktop customers who email us their backups” (P3) for safe keeping, or they have copies at home and need assistance to restore them thinking “I restored the wrong thing!” (P4).

Farmers may also contact customer support for general training and learning how to use more of the software. “There’s lots of hidden functionality in our current product” (P4) which CRS Software intends to expose to users in future releases. Currently “you have to contact a team member at CRS and they’ll tell you all the bits you need to know” (P4). This is an individual process, as “each customer is quite different. It depends on how they use the program” (P6). So it is important to take the time and “get to know the client… then building on that to get to a place to move on” (P6).

So it’s just encouraging those farmers to actually use the program to its full capabilities. Providing training through the coaching team and the support team to actually utilise it and basically get the best out of the program. (P6)

Customer support work with the farmer, providing them with the skills to use Cashmanager RURAL with confidence and to embrace the benefits that a modern web based application can offer to support managing farms. This is an important step in the journey from desktop to online as without the customer movement to the cloud, the business and their development of a modern web based application would not succeed.

4.7 Chapter summary

Three research objectives were stated in Section 1.2 leading to the research question What are the factors and issues encountered by a software development company in their journey from developing desktop software to cloud application software? Through addressing the objectives, three key components are identified and shown in Figure 1, and discussed in this chapter.

The findings related to the first objective, to identify benefits and concerns of transforming desktop software to online/cloud are discussed in Section 4.3 Modern web based application. The factors identified align with those found in prior studies as detailed in Chapter 2.

The second objective, to identify factors affecting the business on their journey to develop online/cloud applications considers the Business of CRS Software in Section 4.4. The direction and long term business strategy (Section 4.4.1) are affected by the development of their application and impact the business with a number of operational changes necessary to support the development (Section 4.4.2).
Section 4.5, *Customer*, addresses the last objective, to identify *factors affecting the customers on their transition to using online/cloud applications*. CRS Software’s customers, farmers, are faced with the need to change the farm management tool to adopt the cloud application. Some customers *embrace modernisation* and eagerly transfer, looking to benefit from using a modern web based application (Section 4.5.1), whereas others are reluctant to change for a variety of reasons (Section 4.5.2).

The key components interact with each other as shown in Figure 1, giving rise to *inter-relationships* (Section 4.6). *Modern web based application and business* intersect in enhancing the program and managing subscription fees (Section 4.6.1). Intellectual property affects both *business and customer* (Section 4.6.2). Experiences of the *customer* are affected by *modern web based applications* (Section 4.6.3). CRS Software’s customer support team represent the *business*, supporting the *customer*, as both move to a *modern web based application* (Section 4.6.4).

It is through considering the key components separately, and as they inter-relate with each other that the research question is answered. Conclusions and contributions from the case study research are outlined in the following chapter.
Chapter 5
Conclusions

5.1 Conclusion

The purpose of this research was to identify the factors and issues encountered by a software development company on their journey from developing desktop software into cloud application software. CRS Software, a New Zealand farm accounting software developer was the focus of this research using a case study approach. A number of factors affecting the move to a modern web based application were identified. Many of these benefit the security, productivity and quality of information available to customers, but also highlight issues such as the reliance on the internet. These findings align with prior studies, as noted in Chapter 4. The software business, CRS Software, faces a number of challenges in this journey affecting their business strategies and operations including management systems and staff. The customer, New Zealand farmers, are affected by the change in their accounting and business management tool. Their approach to adopting new technologies, embracing modernisation or resisting change affects the move to the cloud. This research contributes to the literature by providing insights into these three key components, modern web based application, business and customer, and how they interact with each other as represented in Figure 1.

5.2 Contribution

The move from desktop software to cloud application software is a current issue for software developers and their customers who use their applications. Prior studies identify a number of factors affecting users in this move: popular concerns held by customers, and the opportunities that are embraced. This research explored the move from desktop to online, based on the experiences of CRS Software, an accounting software development company in New Zealand. Unlike prior studies, this research used a case study approach which adds context, and specific detail on these factors as they affect both users and the software development company. In addition, this research adds to the literature by using a different perspective, namely that of the software development company. Despite this, the findings of this case study research add rigour to the field of study and support the literature on factors affecting modern web based applications. Further, this research extends prior studies by identifying two other key components: the business, in this case the software development company, CRS Software; and the customer, farmers using the application Cashmanager RURAL.
5.3 Limitations

With a single-case approach, during analysis, it may result that the case does not characterise the intended research (Yin, 2014). There is also the potential for bias from the interviewer/observer with tensions between getting close to the research to find rich data and remaining distant enough for objectivity (Lofland, Snow, Anderson, & Loftland, 2006). To reduce the possibility of misrepresentation the researcher has triangulated interview data with other forms of data collection that are of a more objective nature including press releases, videos, company web site, customer testimonials and program help files.

A single-case study lacks generalisability, but still has relevance as aspects of the findings will apply to other software development companies, both in New Zealand and overseas.

5.4 Future research

Few prior studies have been undertaken on cloud accounting. There is opportunity to expand this body of knowledge through, in particular, case study research. Future research could focus on farm accounting developers from other countries, accounting software companies not involved in the farming sector, other farm management tools or any other software company making the journey from desktop to cloud. Perspectives of the research could also extend to include customers, bank managers and other business advisors.
Appendix A

Interview

A.1 Interview guide

**Theme 1: Personal background**

Q1. Tell me about your work at CRS Software
   - When did you first start?
   - What is your position?
   - What do you do in your job?

**Theme 2: Development of Cashmanager RURAL from desktop to online**

Q2. Tell me about the evolution in releasing the online version in 2009
   - What were your contributions to the online version?
   - What where the motivations for the online version?
   - When did preparations start?
   - What new functionality did an online version offer, over the desktop version?
   - What impact did the move from desktop to online have on your role?

Q3. What factors affected clients upgrading to the online version?
   - What elements of the online version have encouraged existing clients to upgrade?
   - What barriers have slowed or stopped existing clients from upgrading?

Q4. What factors affected new client purchase/subscription to the online version
   - What factors attracted new clients to the online version vs the desktop version?
   - What factors might have dissuaded new clients from the online version?

**Theme 3: Development of Cashmanager RURAL from online to cloud**

Q5. Tell me about the evolution in working towards a cloud version
   - What are your contributions to the new product?
   - What are the motivations for the cloud version?
   - When did preparations start?
   - What new functionality does a cloud version offer, over the online version?
   - What impact will the move from online to cloud have on your role?

Q6. What factors might affect clients upgrading to the cloud version?
   - What elements of the cloud version will encourage existing clients to upgrade?
   - What barriers might dissuade existing clients from upgrading?

Q7. What factors might affect new client purchase/subscription to the cloud version
   - What elements of the cloud version will attract new clients?
   - What reasons might dissuade new clients from the cloud version?

**Theme 4: Conclusion**

Q8. Any other information that you believe would be useful?
A.2 Research information sheet

Lincoln University
Bachelor of Software & Information Technology (Honours)

Research Information Sheet

You are invited to participate in a project entitled:

Journey of an Accounting Software Company from Desktop to Online

The aim of this project is to examine the experiences of CRS Software Ltd in the transformation of their accounting software from desktop to cloud services.

Your participation in this project will involve an interview about your experience in your role at CRS Software Ltd in relation to the project detailed above. The interview should take approximately 45 to 60 minutes. If you are willing to participate in this research, you will need to sign the attached consent form and return it to me. The interview will be recorded using a recording device with consent.

There are no foreseen risks of you participating in this research.

Brian Eccles has given approval for this project. Results of the project will be published in accordance with the Confidentiality Agreement between CRS Software Ltd and Lincoln University. Names and contact details will not be used as a part of data dissemination. Reference to role rather than name will be used instead in any written or oral presentation. Your participation in this research is voluntary. You may withdraw your participation and the information you have provided for the research by informing the researcher prior to Tuesday, 21 September 2016 by telephone or email.

The project is being carried out by:

Pam Benbow
C316a, Faculty of Agribusiness and Commerce, Lincoln University
Ph: 03-423-0251 E: pam.benbow@lincoln.ac.nz

Supervisors:

Stuart Charters
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Tracy-Anne De Silva
C208, Faculty of Agribusiness and Commerce, Lincoln University
Ph: 03-423-0244 E: tracy-anne.desilva@lincoln.ac.nz
Participant Consent Form

I have read and understood the description of the above-named project. On this basis I agree to participate in the project, and I consent to publication of the results of the project with the understanding that this will be in accordance with the Confidentiality Agreement between CRS Software Ltd and Lincoln University. I understand also that I may at any time withdraw from the project, including withdrawal of any information I have provided, up to Tuesday, 21 September 2016.

I consent to the interview being (please tick the box as appropriate):

(a) Recorded on an audio device. □
(b) Recorded by hand written notes. □

Following the interview (please tick the box as appropriate):

(a) I wish to have the opportunity to read and amend the transcript of the interview(s) conducted with me. □

Signature: ___________________________ Date: ___________________________

Full Name - printed
Appendix B

Coding Themes

## B.1 Coding themes applied to interview data

<table>
<thead>
<tr>
<th>Meta-Theme</th>
<th>Theme</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>Accessibility</td>
<td>The ability to access the data anywhere, anytime, on any device.</td>
</tr>
<tr>
<td></td>
<td>Portability</td>
<td>Moving data between computers. Sharing data within the customer’s business.</td>
</tr>
<tr>
<td>Data security</td>
<td>Data security</td>
<td>Systems in place for prevention of unauthorised access predominantly to the data, but also to CRS Software property.</td>
</tr>
<tr>
<td></td>
<td>Backups</td>
<td>Security of having data backups. (Not security of data and unauthorised access.)</td>
</tr>
<tr>
<td></td>
<td>Data location</td>
<td>Where data is physically stored.</td>
</tr>
<tr>
<td></td>
<td>Data ownership</td>
<td>Ownership of the data. (Separate from location, but might inter-relate with location issues.)</td>
</tr>
<tr>
<td></td>
<td>User rights</td>
<td>Control over sharing data with others to manage a business.</td>
</tr>
<tr>
<td>Data sharing and</td>
<td>Integration</td>
<td>Sharing of data between applications, i.e. other software programs or supporting businesses. Includes bank feeds. (Versus benchmarking or consolidation of multiple CMR farms.)</td>
</tr>
<tr>
<td>consolidated reporting</td>
<td>Benchmarking</td>
<td>Combine and consolidate data between farms where they are owned by one owner. Aggregated data. Comparison between farms.</td>
</tr>
<tr>
<td>Internet connectivity</td>
<td>Internet connectivity</td>
<td>Stability of internet connections</td>
</tr>
<tr>
<td>Automated updates and</td>
<td>Version control</td>
<td>Minimising the number of versions of the software. Affects customer support provided by CRS Software.</td>
</tr>
<tr>
<td>version control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software as a Service</td>
<td>Subscription</td>
<td>Fees, revenue earning for CRS Software, pricing of the product.</td>
</tr>
<tr>
<td>Meta-Theme</td>
<td>Theme</td>
<td>Definition</td>
</tr>
<tr>
<td>-----------</td>
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<td>------------</td>
</tr>
<tr>
<td>Business</td>
<td>Business strategy</td>
<td>Changes and decisions and planning made by CRS Software for the future of their business. Company vision.</td>
</tr>
<tr>
<td></td>
<td>Operational changes</td>
<td>Changes to systems required by CRS Software to support transition to online.</td>
</tr>
<tr>
<td></td>
<td>Role</td>
<td>Background, perspective and focus of the interviewee.</td>
</tr>
<tr>
<td>Customer</td>
<td>Modernisation embraced</td>
<td>Appeal to new customers. Meeting customer and the market expectations. Customer needs and wants.</td>
</tr>
<tr>
<td></td>
<td>Reluctance for change</td>
<td>Client attitudes to change. Motivation. Willingness versus fears of unknown.</td>
</tr>
<tr>
<td></td>
<td>Client education</td>
<td>Computer literacy. Preconceived ideas held by clients that may not be founded.</td>
</tr>
<tr>
<td>Inter-relationships</td>
<td>IP</td>
<td>Intellectual property. The competitive advantage of CRS Software and it’s product over other available products.</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>Client’s movement from one version to the next.</td>
</tr>
<tr>
<td></td>
<td>Customer support</td>
<td>Teaching and training and problem solving for customers. Includes online help and call centre.</td>
</tr>
</tbody>
</table>
References


Ernst & Young. (2011). *Cloud computing issues and impacts* (Global Technology Industry Discussion Series DC0078).


