IT Capability, Customer Information Handling, and Privacy Protection: A Resource-based View of Organisational Performance

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Abstract

What is the influence of Information Technology (IT) capability, and customer relationship management (CRM) capability on organisational information privacy protection behaviour, and ultimately how do these relationships impact on organizational performance? What are the relationships between different types of IT capabilities (i.e. outside-in, inside-out, and spanning capabilities) and how do they impact on performance (i.e. directly or indirectly)? This survey study attempted to answer these questions by empirically testing a research model based on the Resource Based-View (RBV) of the firm and the Comparative Advantage Theory of Competition to examine these relationships in the context of New Zealand firms engaged in IT supported CRM activities. RBV theory claims different subsets of a firm's resources (i.e. assets and capabilities) enable it to achieve initial and long-term competitive advantage (Barney, 1991). The role of different types of IS resources in achieving advantage has not been fully explored with some prior work finding evidence of direct effects but most finding only indirect effects of IS resources in general (Wade & Hulland, 2004).

In addition, Comparative Advantage Theory claims a comparative advantage in resources leads to a competitive advantage in market position which in turn leads to superior financial performance (Hunt & Morgan, 1995). In turn, an organisation's use of customer information primarily for internal knowledge or external relationship building may be related to its privacy protection capability and how it measures performance (Greenaway & Chan, 2005) but these propositions had not yet been empirically tested. A review of the Information Systems literature showed that very little prior work had been done on organisational level privacy protection behaviours. The findings from my study begin to address these gaps in the literature.

This research makes the following contributions to the academic literature on CRM.

First, it empirically tested proposals found in the literature which suggested considering information privacy protection as a resource based on claims made by RBV theory. Second, the research splits IS capabilities into three groups (IS inside-out capability, outside-in capability and spanning capability), splits CRM capabilities into two groups (customer knowledge capability and customer relating capability) and splits organisational performance into two groups (effectiveness and efficiency) in order to assess the role of privacy protection practice as a mediating mechanism between different IS and CRM capabilities and organisational performance outcomes.

The response data was analysed using Confirmatory Factor Analysis based on the Partial Least Squares parameter estimation technique, a form of Structural Equation Modelling. The findings show inside-out (internally focused) IT capabilities have a weak negative direct effect on customer relating capability. However, this can be mediated by investing in IT outside-in and IT spanning capabilities which have a positive impact on customer relating capability. Interestingly, IT Outside-in (externally focused) capabilities had a direct positive influence on customer knowledge capability. This was unexpected as earlier work predicted this relationship would be mediated by IT spanning resources.

As expected, a comparative advantage in customer knowledge capability had a moderate direct positive impact on efficiency, measured as financial performance. It also had a moderate direct positive impact on producing a comparative advantage in customer relating capability. This supports CRM theory which claims that a better understanding of customers based on collecting and processing customer information can lead to a better customer relating capability. But, as predicted, no relationship to privacy protection capability was found. In contrast, using IT to gain a comparative advantage in customer relating capability had a direct positive impact on establishing privacy protection behaviours that exceed guidelines. Treating privacy protection as a resource also appears to lead to greater effectiveness which in turn leads to greater efficiency.

In addition to contributing empirical evidence to support the conditions under which the proposed theoretical model applied, the results had several implications for practice. First, the findings provide organisations with greater awareness of how others in their industry are using IT to support customer relating and customer knowledge capabilities and how safeguarding or not safeguarding information privacy contributes directly to effectiveness and indirectly improves financial performance. Second, the findings are useful for raising consumer awareness about actual organisational information privacy practices. Most organisations in New Zealand reported meeting or exceeding industry guidelines. If the reported safeguards are in place and fair information handling practices are being followed, awareness of the results may help to reduce the high levels of privacy concern reported in consumer surveys. Lastly, privacy protection capabilities have a positive impact on performance, giving organisations an incentive to implement them.

Keywords: Resource Based View theory, organisational-level privacy practices, customer relating capability, customer knowledge capability, customer relationship management (CRM) performance

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Chapter 1: Introduction and Background

Purpose of the Study

The purpose of this study is to improve our understanding of how organisational privacy protection practises impact the performance of organisations engaged in IT supported, customer relationship and customer knowledge management activities, referred to together as customer relationship management (CRM). Organisations' may regard customer information and their ability to manage and use it, as a source of competitive advantage in an efficiency or effectiveness sense, either through building an internally focused customer knowledge capability (CKC) or an externally focused customer relating capability (CRC). This research will examine the influence of IT capability, information privacy protection capability, customer relationship capability, and customer knowledge capability on organisational effectiveness and efficiency. The direct influence of IT capabilities and privacy protection capabilities on an organisation's relative competitive advantage, in terms of both effectiveness and efficiency, is examined along with the potential mediating influences of CKC, CRC and information privacy protection (IPP) capabilities on these direct relationships.

This research builds on a recent call for empirical work in Information Systems using the Resource Based View (RBV) of the firm as a theoretical framework to explain differences in organisational information privacy behaviours (Greenaway & Chan, 2005). RBV theory in this context implies differential investment in IT resources may be related to differences in organisational performance goals which may or may not complement information privacy protection practises.

Introduction

There is growing concern among consumers about the ways organisations collect and use personal information, as companies continue to gather it in increasing amounts. Consumers have expressed growing concerns about the vulnerability of their personal information and potential intrusions on privacy (Milne & Gordon, 1994). Researchers have noted that by disclosing how a customer's personal information is collected and used, marketers can improve consumer decision-making and choice (Beales, Craswell, & Salop, 1981; Bettman, 1975; Hadden 1986). This implies reliable consumer information is vital to marketing. However, when businesses collect consumer information without paying adequate attention to fair information practices, concerns of privacy invasion may grow (Cranor et al, 1999; Chung and Paynter, 2002; Turner and Dasgupta, 2003; Ashrafi and Kuilboer, 2005).

Privacy concerns are important to both customers and businesses. Information and communication technologies such as email, chat rooms, call centres and the Internet have become a medium for exchange between customers and businesses, where consumers can exchange personal information for value such as higher quality services, personalized offers or discounts (Culnan & Milberg, 1998; Glazer, 1991; Milne & Gordon, 1993). However, if the online environment and disclosure of personal information is perceived as risky, it may adversely affect the likelihood of consumers purchasing online (Hoffman, Novak, & Peralta, 1999). Ranganathan and Ganapathy (2002) found information security and privacy had a greater effect on the likelihood of purchase by consumers than the other dimensions (information content and web page design) of e-commerce they examined. Privacy and security concerns have been found to be among the top reasons that prevent people from purchasing online (Ahuja et al, 2003). Perceptions of lack of control over personal information are thought to underlie consumer information privacy concerns (Stewart & Segars, 2002). For example, personal information may be sold to third parties with whom the consumer does not

have an established business relationship without a consumer's permission leading to mistrust (Caudill & Murphy, 2000; Sheehan & Hoy, 2000). Trust, however, is fundamental to building relationships between customers and businesses.

The Federal Trade Commission (FTC) issued a set of Fair Information Practice (FIP) principles in 1998 to guide privacy regulation and industry practice in the United States. Several national level studies have used these FIPs as a guideline to demonstrate that organisational information privacy policies vary amongst firms but have not explained the reasons for this variance (Greenaway & Chan, 2005). It is necessary to see the motivations behind different firms to understand why their privacy polices differ since different privacy policies could affect a firm's performance leading to a different competitive position in the market. The FIP guidelines deal with notice, choice, access and security. They represent recommendations as to how organisations should handle and use customer data. Just as countries differ in how they choose to implement FIPs (e.g. self-regulation in the US, privacy commissioner in New Zealand, registration in the UK), organisational level strategies for implementing FIPs may also differ. Consumer privacy concerns are believed to arise when consumer's think an organisation is not following fair information practices.

A consumer's concern for information privacy (CFIP) has four dimensions according to Smith and Milberg (1996):

- Collection: Concern that extensive amounts of personally identifiable data are being collected and stored in databases.
- Unauthorized Secondary Uses: Concern that information is collected from individuals for one purpose but is used for another, secondary purpose (internally or shared with external third parties) without authorisation from the individuals.
- Errors: Concern that protections against deliberate and accidental errors in personal data are inadequate.
- Improper Access: Concern that data about individuals are readily available to people not properly authorised to view or work with this data.

Several studies using a 15-item survey instrument proposed by Smith & Milberg (1996) have been conducted using the individual consumer as the unit of analysis (e.g. Milberg, Smith, Burke & Kallman, 1995; Milberg, Smith & Burke, 2000; Rose, 2006). These studies support the dimensional nature of the concern for information privacy (CFIP), but the relative importance of the dimensions has been found to differ across countries and over time. These studies also show CFIP influences regulatory preferences. Organisational privacy protection practices may also be expected to differ in the context of different regulatory environments but relatively fewer studies have been conducted at this level of analysis (Greenaway & Chan, 2005).

A failure to safeguard customer information can result in negative consequences to business including loss of trust, damage to reputation, low customer retention, loss of revenue and new business, interruption of cross-border data flows, government enforcement actions, litigation from consumers or privacy advocates, civil and criminal penalties for wrongful disclosure, and the high cost of data protection software to ensure transparency (Fletcher, 2003). Therefore, handling customer information according to FIP guidelines is an important management issue for organisations. Organisations and firms who take information privacy protection seriously may have a comparative advantage in building trust with existing customers to retain them and in attracting new ones. Building trust between firms and customers is an important part of the customer relationship strategy known as Customer Relationship Management (CRM).

CRM is defined by Coltman (2006) as a business strategy whose outcomes optimise profitability, revenue and customer satisfaction by organising around customer segments, fostering customer-satisfying behaviours and implementing customer-centric processes. A CRM strategy may be internally focused on gaining insight about customers and/or externally focused on building relationships. These two aspects of a CRM strategy have been referred to as building a customer knowledge capability and/or a customer relating capability (Greenaway & Chan, 2005). Payne and Frow (2005) analysed definitions of

CRM from the literature, finding a continuum ranging from narrow tactical to broad strategic level definitions. This led to their proposal to define CRM more holistically as:

"A strategic approach that is concerned with creating improved shareholder value through the development of appropriate relationships with key customers and customer segments. CRM unites the potential of relationship marketing strategies and IT to create a profitable, long-term relationship with customers and other key stakeholders. CRM provides enhanced opportunities to use data and information to both understand customers and co-create value with them. This requires a cross-functional integration of processes, people, operations and marketing capabilities that is enabled through information, technology and applications" (p. 168).

This definition uses a cross-functional, process-oriented approach to position CRM at a strategic level. It allows for viewing differences in CRM practice in terms of differences in how firms view customer information. Greenaway & Chan (2005, p. 186) offered the following two propositions for investigating organisational privacy behaviours based on RBV theory and differences in how firms view customer information:

1) Firms that emphasize customer information as an efficiency-based internally-focused learning resource will subordinate privacy concerns and emphasize information collection and reuse behaviours.
2) Firms that emphasize customer information as an effectiveness-based externally-focused learning resource will accord customer privacy concerns priority over their information gathering opportunities.

CRM programs are used by organisations to support the type of customer understanding needed to effectively implement a customer strategy or market orientation (Coltman, 2006). The Business Operations Survey (Statistics NZ, 2006) found that information and communication technology (ICT) improved responsiveness to customers and improved efficiency of work flow processes. Over 50 percent of businesses indicated that ICT was important in achieving outcomes such as better condition of staff and

business activities, improved management information systems, better sales or marketing methods, improved quality management and so on. This statistic implies New Zealand businesses have IT capabilities, but does not provide any detail on how this capability relates to CRM capabilities or organisational performance. This study will investigate how New Zealand organisations' investment in different kinds of IT-capabilities influences their customer knowledge capabilities, customer relating capabilities and information privacy protection capabilities and how these in turn influence organisational performance.

Organisations realize they should place greater focus on economically valuable customers when developing long-term relationships (Romano, 2000; Verhoef & Donkers, 2001). Differential treatment of customers requires information on these customers in order to develop effective customer-specific strategies (Stefanou & Sarmantiotis, 2003). CRM technology and processes are meant to help firms deploy these strategies by collecting and managing customer information, facilitating communication to build individual customer relationships and making use of customization technologies (Verhoef & Donkers, 2001). Therefore up to date customer information is necessary for an effective CRM system. On the other hand, customers have expectations in terms of appropriate organisational practices for collecting, sharing and using personal information which may be given different levels of priority in organisations with different business goals.

Fletcher (2003) found customers' privacy concerns and level of trust can influence an organisation's CRM orientation and consumers' perceptions of organisational CRM practices varied. Different attitudes and beliefs influence a customer's experience with a firm, which affects their level of trust towards the firm's CRM programme. Perceptions of non-compliance with fair information practices may have an impact on performance by reducing trust. Therefore, it is important to improve our understanding of actual organisational level privacy practises and their relationship to organisational performance both in terms of effectiveness and efficiency.

Wade and Hulland (2004) suggest IS researchers focus on system capabilities rather than on IT alone when using Resource-Based View (RBV) theory in empirical research on how IT capabilities relate to strategy and achieving a sustained competitive advantage. They stressed the importance of considering complementary resources, intermediate-level dependent variables (i.e. mediation), relative (i.e. comparative) advantage relative to industry averages and factors affecting sustainability of advantage (i.e. resource attributes) when evaluating the contribution of IT resources to firm performance. Others (Greenaway & Chan, 2005; Rogers, 2005) suggest privacy protection behaviours may be a factor claiming companies who view privacy as a compliance issue may differ from those who view it as a relationship issue. RBV theory claims firms pursue sustainable competitive advantage through the development and deployment of resources. RBV may prove to be useful in explaining differences in the information privacy behaviour of organisations. Consequently, the major task of this study is to empirically determine the usefulness of RBV theory, extended by comparative advantage theory, in explaining the privacy protection behaviours of New Zealand organisations who have invested in IT-supported CRM resources.

Background

Resources are defined as assets and capabilities that are available and useful in detecting and responding to market opportunities or threats (Sanchez et al., 1996; Christensen & Overdorf, 2000). Valuable, rare resources help firms earn rents and lead firms to achieve a temporary competitive advantage. If the firm is able to protect itself against resource imitation, transfer or substitution, the advantage can be sustained over a longer term (Barney, 1991). There are multiple definitions and aliases (e.g. skills, competencies, assets) used to define resources in the RBV literature. For the purpose of this study the definition of resources as assets and capabilities, provided by Wade & Hulland (2004), is used. Assets are defined as tangible or intangible inputs or outputs to a firm's business

processes. Capabilities are defined as repeatable patterns of actions (e.g. skills, processes) in the use of assets to create, produce, and/or offer products to a market (Sanchez et al., 1996 as cited in Wade & Hulland, 2004).

This research argues that a customer's information, once collected, becomes an asset that is available and useful in detecting and responding to market opportunities or threats. Organisational databases, networks and visible infrastructures are tangible assets used in this process. Assets physically exist, while an investment in training staff on privacy protection procedures and activities to maintain the customer information asset is intangible. For example, according to the guidelines of the New Zealand Direct Marketing Association (NZDMA), members of the association should appoint a Privacy Control Officer to be responsible for privacy issues. The skills and knowledge of the hired officer can be treated as intangible. The investment in hiring and training such an officer can be treated as a capability. Appropriate handling of customer information is a capability that may contribute to organisational performance. RBV theory claims only a subset of resources with particular attributes (i.e. rare, valuable, translatable) have the potential to lead the firm to a position of sustained competitive advantage although firms possess many resources. Prior research seeks to identify and distinguish resources that help a firm attain an initial competitive advantage and those that help it to sustain the advantage over time (Piccoli et al., 2002; Priem & Butler 2001a).

Peteraf (1993) classified resource attributes as being either ex ante or ex post limits. Wade and Hulland (2004) suggest Information Technology (IT) researchers consider both limits separately. Ex ante limits to competition imply, prior to any firm's establishing a superior resource position, there must be limited competition for the position (Wade & Hulland, 2004). Value, rarity and appropriability (i.e. translatable into rents) are three attributes in this category. Ex post limits to competition imply, subsequent to a firm's gaining a superior position and earning rents, there must be forces to limit competition for those rents (Wade & Hulland, 2004). Low imitability, low substitutability and low mobility are three attributes in this category. In other words,

a resource that is valuable, rare and can earn rent is able to lead a firm to gain short term competitive advantage. As time goes on, if the resource maintains low substitutability, low mobility and is difficult to imitate, the firm can sustain the competitive advantage for a longer period of time.

This research treats organisational information privacy protection capability as a resource which may affect a firm's performance. The value of customer knowledge capability is increasing as more and more organisations use it to build long term relationships with customers, target prospects, improve customer satisfaction, and identify opportunities for new products or services. In addition, computing and data management continue to become more decentralized and control more diffused (Henderson & Snyder, 1999) challenging the ability of organisations to make effective use of customer information. This research assumes that customer information is of great value to organisations in targeting particular products and services to particular consumer segments to improve sales as well as customer satisfaction and retention. For example, if companies need to provide personalized products, it is necessary to know the individual characteristics or purchasing habits of target customers. Managers may use such information to inform the future development of products or services. Senior managers may use the information to assess the overall performance of the business, and to identify new market segments and strategic options. It is vital for organisations to collect, store and utilise information about their customers (Bueren et al., 2004).

Customers may provide information in response to a request for it, during engagement in an online community, as the by-product of a transaction or indirectly in terms of how the customer navigates an organisation's Web site. The process of handling customer information is a capability which may be difficult to imitate (Srivastava et al., 2001; Hogan & Armstrong, 2001). These capabilities or processes are central to customer relationship management programmes. Commitment and trust between a customer and an organisation may be difficult for a competitor to duplicate in the course of the customer relationship life cycle (Gouthier & Schmid, 2003). Replicating the complexity

of a customer relationship, created via multiple interactions over time may also be difficult (Gouthier & Schmid, 2003) implying the potential to sustain a competitive advantage. The effort and complexity involved in building customer profiles (i.e. a customer knowledge capability) and customer relationships contributes to low substitutability and the desire to retain existing customers. Substituting new for existing customers can be very expensive. Acquiring new customers is a complex process (Gouthier & Schmid, 2003) making it difficult to substitute, imitate or transfer. These characteristics imply an organisation's customer knowledge capability and customer relating capability may be useful in helping a firm to gain competitive advantage. This study seeks to determine the impact of complimentary IT assets and capabilities on these processes and the potential mediating role of organisational information privacy protection capabilities on the influence of customer relating processes on performance. Performance in turn will be assessed both in terms of effectiveness and efficiency measures. IT supported customer relationship management faces challenges due to the privacy concerns of customers (Fletcher, 2003). If a consumer trusts an organisation, the collection of customer information will not worry them. If they do not, the potential for not disclosing information or giving inaccurate information becomes a major possibility with serious implications for the success of IT-supported customer relationship management systems.

Outline of the Study

Chapter one emphasized the growing privacy concerns surrounding organisational collection and handling of customer information. Gaps in privacy research, at the organisational level in the Information Systems literature, cited by Greenaway & Chan (2005) were summarised. This study seeks to address this gap by proposing and testing a theoretical model based on the RBV and Comparative Advantage theories in the context of IT investment in complimentary CRM capabilities and their influence on organisational privacy protection behaviour. The key assumptions of the proposed

research model, based on RBV theory, are:

Assumption 1: Privacy protection capability is positively related to firm performance measured in terms of effectiveness.

Assumption 2: Privacy protection capability is indirectly related to firm performance measured in terms of efficiency via its impact on effectiveness.

Chapter two reviews the literature on RBV theory and Comparative Advantage theory along with the empirical work related to key constructs and relationships relevant to these theories. A research model to explain the relationship between IT capability, information privacy protection capability, customer relationship capability, customer knowledge capability and organisational performance is proposed. Hypotheses based on the relationships shown in the research model are discussed.

Chapter three provides rationale for using the survey research method and explains the data collection and data analysis procedures followed. Sampling procedures, survey instrument design and pre-testing procedures are discussed. Respondents consisted of organisations engaged in IT-supported CRM in New Zealand. Partial least squares structural equation modelling, using PLS-Graph 3.0, was used to examine the quality of the measurement model and to assess support for the hypotheses (i.e. the structural or theoretical model). Chapter four presents the results and Chapter five interprets the results, relating them to prior work discussed in Chapter two. Chapter six summarises the key conclusions of the research, points out limitations of the study and makes suggestions for future research.

Chapter 2: Theoretical Framework

This chapter is organised around a theoretical framework based on prior research and theory concerning the relationships between Information Systems (IS) resources, information privacy protection resources and organisational performance. The framework is based on Resource-Based View (RBV) theory, prior empirical tests of RBV theory and extensions of RBV found in the literature. This chapter begins with a brief discussion of the rationale behind choosing to use RBV theory in this study. This is followed by sections describing RBV theory; and extensions of RBV theory to account for the roles of IS resources, information privacy protection resources and comparative advantage. A model summarising a general theoretical framework based on this prior work is presented. This general model is refined into the more specific research model examined in this study. All constructs in the model are defined at the organisational level, the unit of analysis used in this study. Finally, controversial findings in the empirical literature on the relationships among the constructs in the model are discussed prior to stating the hypotheses tested in this study.

Reasons for Choosing the Resource-Based View

Calls for more empirical work in Information Systems using RBV theory to study the role of IS (Santhanam & Hartono, 2003; Wade & Hulland, 2004) and to study organisational level information privacy protection strategies (Greenaway & Chan, 2005) as organisational resources have recently appeared in the IS literature. Wade & Hulland (2004) conducted a comprehensive review of prior work in IS using RBV theory and pointed out the need to look at issues such as resource attributes (e.g. value, rarity), resource compliments (i.e. mediating effects), moderating factors and different types of IS resources when studying the impact of IS resources on organisational performance. Similarly, Greenaway & Chan (2005) conducted a review of the information privacy

literature and classified this prior work based on the unit of analysis as individual-level research, sectoral/national-level research and organisational-level research (Greenaway & Chan, 2005). Most prior studies of information privacy in the context of advances in information technologies have focused on the consumer side (e.g. Culnan, 1993; Culnan & Armstrong, 1999; Smith et al., 1996; Earp et al., 2002; FTC, 1998, 2000; Rose, 2005, 2006). Research at the individual level has examined consumer concern for information privacy as a multi-dimensional construct or has attempted to measure and explain changes in consumer attitudes about information privacy at different points in time. Research at the national or sectoral level has sought to explain differences in privacy concern across countries or across groups within countries focusing on the differential effects of privacy laws and regulatory frameworks on privacy concerns (e.g. Milberg, Smith & Burke, 2000).

Relatively less work at the organisational level can be found in the literature (Greenaway & Chan, 2005). Organisational-level research seeks to understand how different organisational views on balancing the benefits of information uses with potential privacy concerns can explain differences in organisational information handling strategies and practices. Prior work at this level has been classified previously into studies on information privacy as organisational liability, information privacy as an organisational decision outcome, and information privacy as an organisational ethical imperative (Greenaway & Chan, 2005). However, Greenaway & Chan (2005) called for the use of other theories, such as RBV or Institutional Theory, based on gaps in current theory and empirical work on organisational privacy strategy identified in their review of the literature. This study builds on their work by proposing and testing a research model, with constructs defined at the organisational level, based on RBV theory and its extensions.

Consumer concerns about information privacy have become more important to consumers as information technology capabilities for collecting, sharing and managing information on consumers have become more prominent. These developments have

increased the importance of looking at information privacy as an information management issue at the organisational level. Researchers, managers and policy makers all have a role to play in dealing with the information privacy concerns of consumers in a way that still allows the benefits of new information technologies for building relationships between organisations and consumers, managing customer information and developing new products and services to be utilised (Culnan & Armstrong, 1999; Davison et al., 2003; Milberg et al, 2000; Smith, 1993). Further studies using alternative theoretical perspectives are needed to explain similarities and differences in organisational information privacy practises (Greenaway & Chan, 2005; Milne & Culnan, 2002). One theory which may prove useful here is RBV theory. The following sections of this chapter discuss RBV theory, summarise several proposed extensions from the literature on how to incorporate IS resources, information privacy protection as a resource, and to consider comparative advantage in performance.

RBV Theory and Relevant Extensions

RBV Theory

The Resource-based View of the firm, hereafter referred to as RBV theory, is an economic approach developed by Barney (1991) to explain the relationship between organisational resources and gaining or sustaining a competitive advantage. RBV theory views an organisation as a rent-seeking entity that pursues competitive advantage by developing and deploying resources (Greenaway & Chan, 2005). Only resources (i.e. assets and capabilities) which are valuable, rare, imperfectly imitable and non-substitutable are likely to lead to a sustained competitive advantage (Barney, 1991). Empirical tests of RBV theory began in the field of strategic management (e.g. Mahoney & Pandian, 1992) and were followed by studies in other management disciplines (e. g., Barney, 2001; Fahy & Smithee, 1999; Foss, 1998; Priem & Bulter, 2001a, 2001b) including Information Systems (e.g. Bharadwaj et al., 1998; Ray et al., 2004; Ravichandran & Lertwongsatien, 2002; Santhanam & Hartono, 2003). Table 2.1, sourced from Wade and Hulland (2004) and updated (i.e. added last 3 rows) for this

study, summarises prior literature that applied RBV to the study of the correlation between IS resources and firm performance.

Table 2.1 Prior work using RBV to examine investment in IS resources and firm performance.

Relationship Examined	Findings	Title	Authors
IS & Sustained Competitive Advantage (SCA)	Argues that IS cannot, in and of itself, lead to SCA, but may assist other resources in doing so. Referred to as the strategic necessity hypothesis. Only loosely based on the RBV.	Sustaining IS Advantage: The Role of Structural Differences	Clemons and Row(1991)
IS & SCA	Considers whether four IS resources lead to SCA under the resource-based view. The resources are access to capital, proprietary technology, technical IS skills, and managerial IS skills. Using logical RBV arguments, finds that managerial IS skills are the only resource that leads to SCA.	Information Technology and Sustained Competitive: A Resource-based Analysis Advantage	Mata et al. (1995)
IS , business process & SCA	Supports the strategic necessity hypothesis. Finds that IS alone cannot produce SCA, but that IS can leverage other intangible, complementary human and business resources to gain SCA.	Information Technology as Competitive Advantage: The Role of Human, Business, and Technology Resources	Powell and Dent-Micallef (1997)
IS & SCA	Develops a series of success components through which IS can lead to SCA. Evaluation of these components leads to an organizational information quotient.	Building Competitive Advantage Through Information Systems: The Organizational Information Quotient	Service and Maddux (1999)
IS & customer service performance	Study finds that managerial IS knowledge leads to enhanced customer service performance but flexibility of IS infrastructure, IS technical skills, and IS applications do not	Information Technology and Competitive Advantage: A Process Oriented Assessment	Ray et al. (2001)
IS resources, capabilities & performance	Examines complementarity from a resource-based perspective. Finds preliminary support for the relationship between IS and non-IS firm capabilities in achieving superior firm performance	Impact of Information Systems Resources and Capabilities on Firm Performance: A Resource-Based Perspective	Ravichandran and Lertwongsatien (2002)

Relationship Examined	Findings	Title	Authors
IS capability & performance	Extends and confirms Bharadwaj (2000). Finds that firms with superior IS capability also exhibit superior firm performance.	Issues in Linking Information Technology Capability to Firm Performance	Santhanam and Hartono (2003)
IS capability, organisational learning & performance	Used RBV to find out that organizational learning plays a significant role in mediating the effects of IS competency on firm performance.	Information Technology and Customer Orientation: A Study of Direct, Mediated, and Interactive Linkages	Tippins and Sohi (2003)
IS capabilities & organisational performance	Literature review on applications of RBV in IS research.	The Resource-Based View and Information Systems Research: Review, Extension, and Suggestions for Future Research	Wade and Hulland (2004)
IS capabilities & customer orientation	Study finds that IS capabilities can help firms be more customer-focused.	Information Technology and Customer Orientation: A Study of Direct, Mediated, and Interactive Linkages	Nakata and Zhu (2006)
IS capability & financial performance	Found that IS capability increases financial performance for prospector organisations, using an empirical test including data collection from 216 firms.	Capabilities and Financial Performance: the Moderating Effect of Strategic Type	Song, Benedetto & Nason (2007)

RBV as an Explanation for the Contribution of IS Resources

The American National Standards Institute (ANSI) defines an Information System (IS) as: 1) a system, whether automated or manual, that comprises people, machines, and/or methods organized to collect, process, transmit, and disseminate data that represent user information. **2)** Any telecommunications and/or computer related equipment or interconnected system or subsystems of equipment that is used in the acquisition, storage, manipulation, management, movement, control, display, switching, interchange, transmission, or reception of voice and/or data, and includes software, firmware, and hardware. **3)** The entire infrastructure, organization, personnel, and components for the collection, processing, storage, transmission, display, dissemination, and disposition of information.

IS has been studied for its role in creating both initial competitive advantage and

long-term, sustained competitive advantage (e.g. Barney, 1991; Clemons, 1988; 1991; Clemons & Kimbrough, 1986; Clemons & Row, 1988; 1991; Feeny, 1988; Feeny & Ives, 1990). Research on IS resources and organisational performance describes how IS can lead to an advantage. For example, Mata et al. (1995) used RBV theory to suggest that five key IS factors (customer switching costs, access to capital, proprietary technology, technical IS skills and managerial IS skills) lead to sustained competitive advantage. Similarly, Powell and Dent-Micallef (1997) found that IS alone cannot produce sustained competitive advantage (SCA); but IS can leverage other intangible, complementary human and business resources to gain SCA. From a RBV perspective, the above IS-related advantages may result from development of capabilities that other competitors find difficult to copy. Relative to the use of RBV in the field of strategic management (Barney, 2001), very little empirical work on the use of RBV to understand the impact of IS resources on performance has been done (Wade & Hulland, 2004).

Wade and Hulland (2004) conducted an extensive review of the use of RBV theory in IS research. They provided a brief review of resource-based theory and suggested extensions to make the RBV more useful for empirical IS research. First, a typology of key IS resources was presented, and described using six traditional resource attributes. They will be discussed near the end of this chapter. Second, the review suggested future research should consider both resource complementarity and moderating factors when studying IS resource effects on organisational performance. Lastly, the review discussed three considerations that IS researchers need to address when using the RBV empirically. Eight sets of propositions were advanced.

In addition, Wade and Hulland (2004) also made several other suggestions for using RBV in empirical IS research including the following. First, use of the RBV should consider the choice of an appropriate level of resource specificity, an outcome construct, and the introduction of dynamic elements. Second, IS resources can be divided into outside-in resources (external relationship management and market responsiveness), spanning resources (IS-business partnerships, IS planning and change management),

and inside-out resources (IS infrastructure, IS technical skills and IS development). Third, capabilities were seen as more likely to lead firms to competitive advantage than assets because the development of capabilities is difficult to trade; and the firm may possess a capability that is idiosyncratic to the firm or difficult to imitate due to path dependencies (Dierickx & Cool, 1989) or being embedded in a firm's culture (Barney, 1991). Finally, they concluded that RBV is a useful theory for relating IS resources to firm strategy and performance since it provides a framework to evaluate the strategic value of IS resources and guidance on how to differentiate among various types of IS resources. A firm may invest in IS resources to help it implement a wide range of competitive strategies such as cost leadership, product differentiation, strategic alliances and so on (Barney, 1996).

Investment in IS capability and customer relationship management are important because these capabilities might be a source of competitive advantage in the short term, and then turn into a source of sustained competitive advantage over time (Barney, 1991). These capabilities may translate into better financial performance when they are treated as market-based resources (Day & Wensley, 1998). However, only a few studies have claimed IS resources have a direct and positive impact on organisational performance (e.g. Banker & Kauffman, 1991; Mahmood, 1993). In contrast, most studies find complimentary resources must be present to mediate the IS capability to performance relationship (Wade & Hulland, 2004). Information resources may need to interact with other business resources to help organisations build unique capabilities which are difficult to imitate in order to achieve competitive advantage, in the longer term. A larger number of studies (e.g. Banker & Kauffman, 1988; Carroll & Larkin, 1992; Clemons & Row, 1988; Clemons & Row, 1991 cited by Wade & Hulland, 2004) find complimentary resources must be present to mediate this relationship. The majority of the empirical evidence predicts that information technology needs to interact with other human and business resources to create Information Systems resources which are valuable, rare and appropriable in order to achieve initial, short-term competitive advantage. To achieve a long-term advantage, IS resources must be difficult to imitate,

hard to substitute, and imperfectly mobile (Wade & Hulland, 2004). Only a few studies (e.g. Sager, 1988, Venkatraman & Zaheer, 1990 cited by Wade & Hulland, 2004) found that strategic information technology had no impact on performance.

RBV as an Explanation for Organisational Information Privacy Behaviours

Greenaway and Chan (2005) propose to extend RBV to the information privacy protection area. They view customer information as a resource that supports learning throughout the organisation. Firms are assumed to have different information privacy policies according to whether they focus on the intellectual/knowledge aspect or the social/relationship aspect of their information handling activities in order to achieve competitive advantage. Greenaway and Chan (2005) believe that two types of firms search for competitive advantage based on strategic differentiation. They both treat customer information as a key resource but differ in how they collect and handle customer information.

The first type of firm has a customer focus and will simply gather less information in order to avoid alienating their customers. Customer information is used to support effectiveness-focused learning in order to improve a firm's adaptive capability in a changing external environment. This type of firm is more likely to pursue the development of a customer relating capability to achieve competitive advantage. A focus on customer relationship capability reflects the view that firms can pursue competitive advantage through the development of the core competence of trustworthiness (Barney & Hansen, 1994; Jarvenpaa & Leidner, 1998).

On the other hand, the second type of firm has an information focus and will gather as much information as possible giving less regard to privacy. They treat customer information as an organisational resource that supports the development of a customer knowledge capability. Customer information is more likely to be used to support efficiency-focused, internally oriented learning in order to provide more targeted offers to their customers (Greenaway & Chan, 2005). This type of firm pursues the

development of superior customer knowledge capability to achieve competitive advantage. A superior customer knowledge capability gives a firm the ability to track and predict changing customer preferences in order to produce products and services that better match customer needs (Bhardawaj, 2000).

RBV and Comparative Advantage

Hunt and Morgan (1995) suggest that when a firm has a resource that is rare among its competitors or unique to the firm itself, it has the potential to achieve comparative advantage in that resource. Comparative advantage appears to explain key macro and micro phenomena better than neoclassical economic theory. In neoclassical theory, perfect competition is assumed but in practice does not exist. Comparative advantage theory adopts the epistemology of scientific realism, unlike the positivist epistemology of neoclassical theory, providing a better fit with real world competition in market-based economies in the context of government regulation and political constraints.

The theory of comparative advantage of competition is an extension of RBV theory. It adopts a similar definition of resources and their attributes. It uses the definition of a resource from Barney (1991), as being both tangible and intangible assets. When a firm has a resource that is rare among competitors, it has the potential for producing a comparative advantage for that firm. However, the theory of comparative advantage considers marketing position as an additional construct in the theory. It assumes that a comparative advantage in resources exists when a firm's resource assortment enables it to produce a superior market offering, relative to extant offerings by competitors. If it is perceived by some market segments to have superior value and /or it can be produced at lower costs, a comparative advantage in resource can translate into a position of competitive advantage in the marketplace and superior financial performance (Hunt & Morgan, 1995). According to Ramaswami, Bhargava & Srivastava (2004), better financial performance results from superior performance in market-based assets and capabilities. Comparative Advantage Theory links firm capabilities with business

process performance (Hunt & Morgan, 1995).

Figure 2.1 is a graphical model of RBV theory with the extensions discussed in the previous paragraphs. This study builds on this theoretical model. It proposes customer relating capability, customer knowledge capability, information privacy protection capability and business process effectiveness as possible mediators (i.e. complimentary resources) of the relationship between comparative advantage in IS resources and organisational financial performance. Greater detail on how each of the constructs in Figure 2.1 was operationalised follows.

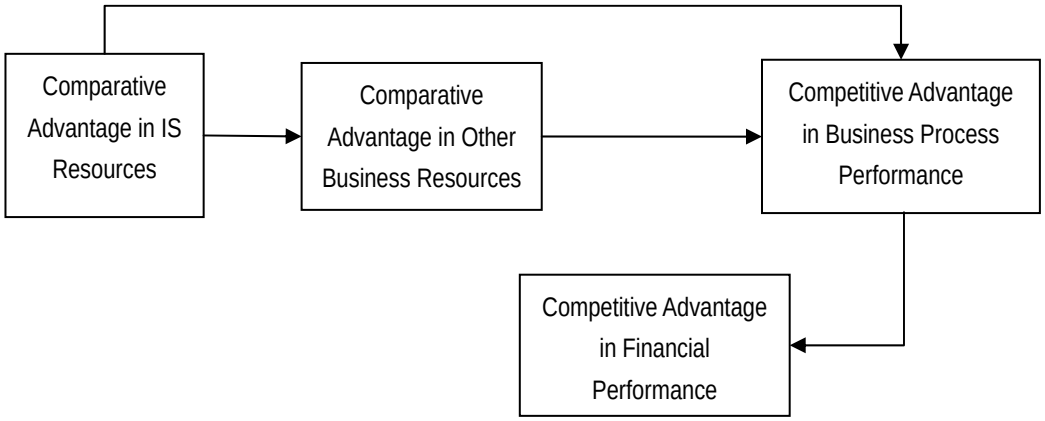

Figure 2.1 General theoretical model of extended RBV Theory.

Research Model

Figure 2.2 shows how the concepts in the general theoretical model above have been refined into measured variables used in this study. The hypotheses shown graphically as relationships between variables in Figure 2.2 are discussed in the following sections. IS resources are represented as IS inside-out capabilities, IS outside-in capabilities and IS spanning capabilities. Customer relating capability, customer knowledge capability and information privacy protection capability are shown as mediators of the relationship between IS resources and organisational performance. Organisational performance is measured in terms of effectiveness and efficiency. CRM effectiveness is shown as a mediator and efficiency is measured in terms of financial performance.

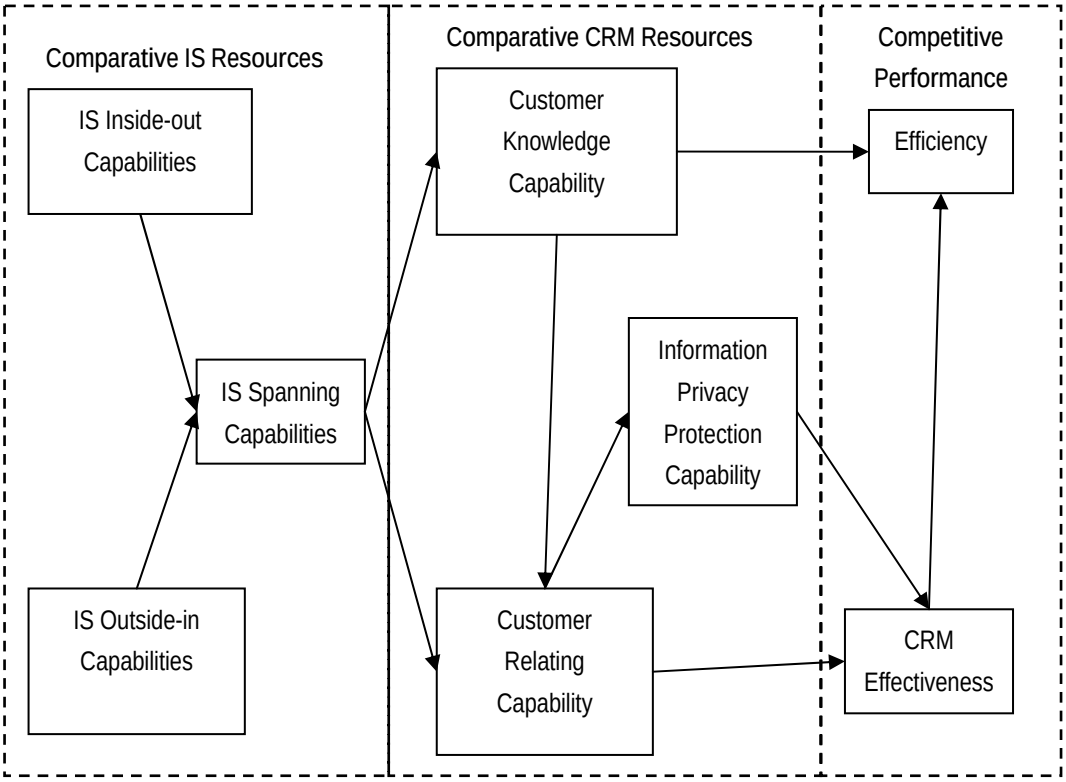

Figure 2.2 Research model based on the RBV Theoretical Framework.

Variables in the Research Model

IS Capabilities

The IS resources measured in this study are based on three types of IS capabilities: outside-in capabilities, inside-out capabilities and spanning capabilities cited by Wade & Hulland (2004). Day (1994) argued for this classification of IS resources based on three types of business processes: inside-out, outside-in and spanning. Comparative advantage in these three groups of IS resources was considered in this study. The following paragraphs define and discuss these three capabilities.

1) IS Inside-out Capabilities

An inside-out capability is a capability which can be deployed from inside a firm in

response to market requirements and opportunities. They are internally focused (e.g. technology development and cost controls); while outside-in capabilities are externally oriented. IS infrastructure, IS technical skills, IS development and cost effective IS operations were categorized as four aspects of inside-out resources (Wade & Hulland, 2004). This study adopted IS infrastructure and IS strategy as two aspects of inside-out resources, since existing studies have stressed the importance of integrating IS and business strategy (Bakos & Treacy, 1986; Beath & Ives, 1986; Feeny & Wilcocks, 1998; Henderson & Venkatraman, 1993; Quinn & Baily, 1994).

a) ***IS infrastructure.*** IS infrastructure refers to the foundation for an organisation's applications and services and is comprised of data, network, and processing architecture assets (Duncan, 1995; Weill & Broadbent, 1998). The IS infrastructure resource is an asset which has generally not been found to be a direct source of sustained competitive advantage for firms (Mata et al.,1995; Powell & Dent-Micallef, 1997; Ray et al., 2001).

b) ***IS strategy.*** Business IS strategic thinking refers to management's ability to envision how IS contributes to business value and the ability to integrate IS planning with the firm's business strategies (Bharadwaj, Sambamurthy & Zmud, 1998). Previous research has focused on the importance of integrating IS and business strategy (McKenny, 1995). IS strategy capability refers to the ability to formulate an adaptable plan about the role of alternative IS architectures, international standards and future technology changes on business strategy. It includes the ability of IS managers to understand how technologies can and should be used, as well as how to motivate and manage IS personnel through the change process (Bharadwaj, 2000).

2) IS Outside-in Capabilities

Outside-in capability is defined as the ability to anticipate market requirements, create durable customer relationships and understand customers. Outside-in resources include

external relationship management and market responsiveness (Wade & Hulland, 2004). However, this study distinguishes external relationship management from market responsiveness as market responsiveness is considered as an aspect of customer relating capability. Therefore market responsiveness is discussed later in the section on customer relating capability.

External relationship management. External IS linkages refer to "*technology based linkages between the firm and its key business partners, including customers, suppliers, and other external collaborators*" (Bharadwaj, Sambamurthy & Zmud, 1998). Complicated interactions between suppliers and customers result from inter-organizational IS resources such as electronic distribution channels, which foster sharing of knowledge and customer information (Konsynski & McFarlan, 1990; Zaheer & Venkatraman, 1994). Such IS capabilities are not only considered as technology opportunities within a firm, but also as capabilities of external partners (Bharadwaj, Sambamurthy & Zmud, 1998).

3) IS Spanning Capabilities

Spanning capability was defined as the ability to integrate a firm's inside-out and outside-in capabilities. This resource category includes IS-business partnerships and IS planning and change management (Wade & Hulland, 2004). This study considers both constructs.

a) IS business partnerships. IS business partnership refers to a firm's ability to foster rich partnerships between technology providers (IS professionals) and technology users (business unit managers). This capability represents the processes of integration and alignment between the IS functions and other functional areas or departments of the firm. Former studies recognize the importance of building relationships internally within the firm between the IS function and other departments (e.g. Bharadwaj, 2000; Jarvenpaa & Leidner, 1998; Armstrong & Sambamurthy, 1999; Bharadwaj et al., 1998; Ross et al.,

1996). Bharadwaj, Sambamurthy and Zmud (1998) found that interaction between IS staff and business unit managers is critical for developing innovative IS applications. The use of multi-disciplinary teams to blend business and IS experiences, and to foster a climate that encourages risk taking and experimentation with IS are two aspects of IS business partnerships (Henderson, 1990). The partnership relationship builds a communication channel between business and IS communities (Feeny & Willcocks, 1998), and helps to span the traditional gaps that exist between functions and departments, resulting in superior competitive position and firm performance (Wade & Hulland, 2004).

b) *IS planning and change management.* IS management refers to activities related to the management of the IS function. IS planning, IS project management practices, security control, standards compliance and disaster recovery are all types of IS functions (Delone, 1988; Magal, Carr & Watson, 1988; Martin, 1982; Zahedi, 1987). IS management effectiveness ensures consistency of IS policies throughout the organisation and IS management quality has been found to have a significant impact on organizational IS success (Boynton, Zmud & Jacobs, 1993).

Customer Relating Capability and Customer Knowledge Capability

Customer Relationship Management (CRM) is a management approach that uses deep customer insights and analysis, drawn from individual customer interactions, to understand and predict consumer behaviour and fulfil customer needs as completely as possible (Sheth & Parvatiyar, 1995). It focuses on managing relationships between a company and its customers with various contacts, interactive processes and communication elements (Groenroos, 2000). However, this study subdivides the CRM capability into two groups: Customer Relating Capability (CRC) and Customer Knowledge Capability (CKC) to disaggregate the influence of the IS capability constructs on the CRC and CKC aspects respectively.

1) Customer Relating Capability

CRC in this study focuses on building, developing and maintaining long-term relationships (Groenroos, 1990; Gummesson, 1987). In this research they are expected to lead to competitive advantage through the core competence of trustworthiness (Barney & Hansen, 1994; Jarvenpaa & Leidner, 1998). CRC includes two constructs: market responsiveness to customers and customer nurturing (Ramaswami, Bhargava & Srivastava, 2004).

a) Market responsiveness to customers. Appropriate response to customer needs may improve an organisation's ability to retain customers. Day (1994) pointed out that "*closer connections between customers and business lead to stronger feelings of loyalty and the relationship created by this loyalty allows the company to develop customer specific information and capabilities that are hard to match*" (p. 151). The ability to respond quickly to changes in customer needs and wants in terms of new or modified product and service offerings is enabled by up-to-date and accurate information on customer preferences and behaviours.

b) Customer nurturing. Organisations have to nurture customers by providing them with greater value (Fenwick, 2001) in order to retain them and maximize their lifetime value to the firm (Sheth & Parvatiyar, 1995). Organisations might achieve a competitive position as customer nurturing takes time to develop and intimate relationships with customers can be relatively rare and difficult for other competitors to replicate (Francis, 2000).

2) Customer Knowledge Capability

Customer knowledge management (CKM) is the process of managing knowledge about customers (Rowley, 2002). CKM generates, disseminates and uses customer knowledge within an organization and between an organization and its customers (Rollins &

Halinen, 2005). Its goal is to learn about, from and with customers in order to support CRC efforts. CKM capabilities combine with CRC to identify and focus resources on high-value customers, attract them by capturing and using knowledge about them in order to develop customized offerings and personalized communications (Bharadwaj, Sambamurthy& Zmud, 1998). Therefore CKC includes developing a comprehensive understanding of high value customers, market responsiveness to competitor actions, and the use of detailed customer information to develop unique products/services.

a) ***High value customers.*** A focus on high-value customers can lead to the retention of the right customers and ultimately increased profits (Smith, 2001). Due to limited budgets for customer retention activities, firms usually concentrate on the most valuable customers with the highest lifetime value. Greenyer (2003) suggests using a series of models to identify the customers that have the highest probability of lifetime value. Electronic CRM software packages and applications can gather customer information and use analytics such as data mining to identify high-value customers to satisfy the need of maximizing the chance to retain high-value customers.

b) ***Responsiveness to competitors.*** Responsiveness to competitors is a capability that can be used to retain customers. Only when compared with competitors, can superior customer value be assessed, so market-responsive firms should be responsive to competitor's actions (Bharadwaj, Sambamurthy & Zmud, 1998). "*Responsiveness is a quality that will lead to a higher level of customer satisfaction and loyalty and favourable competitive advantage in the market*" (Day, 1994).

c) ***Customer information for developing unique products/services.*** Customer information can be used to tailor products/services to individual customer needs. As customer information is collected and integrated from multiple sources it can be translated into customer knowledge in order to offer personalized

products/services (Moorman, 1995). Information acquisition processes and information transmission processes are related to the further uses and sharing of information internally without notice from the perspective of Moorman's research. Information acquisition processes refer to the collection of primary or secondary information from organizational stakeholders. Kohli and Jaworski (1990) point out that information acquisition is related to intelligence generation, which is customer knowledge management but from an organizational rather than customer oriented perspective. On the other hand, information transmission processes refer to the degree to which information is diffused among relevant users within an organisation (Beyer & Trice, 1982; Glaser, Abelson, & Garrison, 1983; Kohli & Jaworski, 1990). It relates to the sharing of information between marketing departments and other departments, which is relevant to the sharing of customer personal information from the perspective of privacy. Sharing information with business partners is also a controversial issue in information transmission processes (Moorman, 1995).

Information Privacy Protection Capability

Information Privacy Protection Capability (IPP) is defined as an organisation's investment of time and other resources in protecting a customer's personal information in a way that will not raise privacy concerns. This may involve putting a privacy protection policy in place. Investment includes investment in both tangible and intangible assets (Barney, 1991). Customer information is considered as a tangible asset in this research, and, it is also assumed to be a necessary resource for creating competitive advantage.

Investment in IPP can be specifically represented by an organisation's privacy practices. The data handling guidelines (Data Advisory Network, 2007b) of the New Zealand Marketing Association (NZMA) state how organisations in New Zealand should handle the data they collect on their customers in order to comply with fair information practices and the Privacy Act of 1993. The following dimensions are aspects of privacy

protection capability: training staff on privacy protection issues, giving notice/choice to customers, secondary uses of customer information, error correction, and unauthorized access.

Efficiency and Effectiveness

This study disaggregates performance into CRM effectiveness and efficiency. In service-sector businesses, who engage in CRM, customer satisfaction and internal efficiency can work against each other (Fornell & Rust, 1997). This implies a sort of conflict between them. Viewing performance separately as effectiveness and efficiency outcomes is also suggested for organisational-level privacy research (Greenaway & Chan, 2005).

a) ***Efficiency.*** Efficiency refers to the ratio of effective or useful output to the total input to a system. In this study it is defined as an organisation's financial performance. It reflects an organisation's perceived profitability and market performance (Moonman & Rust, 1999). Development of a superior customer knowledge capability, which can be utilized internally by organisations to pursue improvements in personalized services/products, in predicting customer preferences and in tracking marketing trends may focus more on improving financial performance. The focus of efficient financial performance is to increase productivity and decrease costs.

b) ***Effectiveness.*** Effectiveness is defined as an organisation's perceived ability to satisfy and retain customers by offering quality products and services (Moonman & Rust, 1999). Effective performance may result from the development of a customer relating capability, which appreciates in value over time (i.e. customer lifetime) leading to trust and the ability to gather better information from customers. Better performance has been associated with building long-term relationships with customers which is expected to indirectly improve financial performance. Customer satisfaction, customer retention and service quality are important aspects of the

effectiveness of CRC (Griffin & Page, 1993). The focus of effectiveness as a performance outcome may have an impact on customer trust and behaviour (Kordupleski, Rust & Zahorik, 1993).

Research Hypotheses

Arguments and discussions are given here to identify and support the relationships among the constructs discussed above. The relationships among IS capabilities, CRC, CKC, IPP capability, efficiency and effectiveness described in this section are based on prior theory and prior empirical findings. First of all, why and how the three constructs of IS capabilities (e.g. inside-out resources, outside-in resources and spanning resources) interact is described. Secondly, the relationships between CKC and CRC; how they relate to IS capabilities; and why they might mediate IS spanning resources to IPP capability are discussed. Thirdly, how CRC and CKC might impact on efficiency and effectiveness is discussed. Finally, arguments for why IPP might mediate the relationship between CRM resources (i.e. CRC and CKC) and Performance (i.e. efficiency and effectiveness) are given.

IS Inside-out, Outside-in and Spanning Capabilities

RBV argues that resources that are valuable and rare, but can be appropriated by the owning firm, provide firms with a temporary competitive advantage (Barney, 1991). A firm can sustain a competitive advantage over a longer time by obtaining or developing resources which will be hard to imitate, transfer or substitute. Resources include capabilities and assets. Capabilities are usually harder to duplicate than assets (Wade & Hulland, 2004). Resources, including inside-out, outside-in and spanning IS resources can be distinguished by the following six attributes: value, rarity, appropriability, imitability, substitutability, and mobility. Overall, there is more evidence that IS inside-out resources are less likely to lead directly to achieving a competitive advantage

relative to the other two types of IS resources. These three types of IS resources are discussed in terms of these six attributes in the following sections. Attributes including value, rarity and appropriability contribute to a short term competitive advantage, while the attributes of imitability, substitutability and mobility contribute to achieving a sustained competitive advantage.

1) ***Value.*** IS capabilities described here have at least a moderate value to the firms that possess them. However outside-in and spanning capabilities seem to have potentially higher value than inside-out capabilities (Wade & Hulland, 2004). While inside-out capability can lead to greater efficiency and/or effectiveness at any particular time, the outside-in and spanning capability must be based on a continued understanding of the changing business environment. IS infrastructure resources, belonging to inside-out resources, have generally not been found to be a source of sustained competitive advantage for firms (Mata et al., 1995; Powell & Dent-Micallef, 1997, Ray et al., 2001).

2) ***Rarity.*** IS capabilities have higher rarity relative to IS assets. However, outside-in and spanning capabilities are likely to be associated with a higher degree of rarity than are inside-out resources (Wade & Hulland, 2004). IS infrastructure can be acquired or copied relatively easily once it has been in existence even for a comparatively short period of time; even though it might be very rare initially. But, spanning and outside-in capabilities tend to be socially complex and can not be easily acquired in the marketplace. However, IS strategy could also be hard to duplicate as an inside-out capability, since it involves qualitative assessment and evaluation of both internal and external information, drawing on personal experience and a broad understanding of the business all of which may be difficult to duplicate.

3) ***Appropriability.*** According to former observations, inside-out capabilities may be appropriable, rent-generating resources in the short term, particularly when a firm

possessing the IS resource has a first-mover advantage. Secondly, appropriability of outside-in and spanning resources tends to be lower than that of inside-out resources (Wade & Hulland, 2004).

4) ***Imitability.*** Outside-in and spanning capabilities (especially IS-business partnerships) are likely to be more difficult to imitate because both sets of capabilities tend to be socially complex. Existing empirical evidence suggests that IS-infrastructure is particularly easy to imitate over moderate to longer time periods (Wade & Hulland, 2004).

5) ***Substitutability.*** It seems unlikely that strategic alternatives of IS infrastructure exist that lead to the same ultimate competitive position, therefore the substitutability of this resource will be low (Wade & Hulland, 2004). Strategic substitutes for both outside-in and spanning capabilities are also likely to be rare, although it could be possible for firms with a subset of these capabilities to compete on an equal basis with firms possessing a different subset.

6) ***Imperfect Mobility.*** Inside-out capabilities, such as IS infrastructure, are easily duplicated by other companies. They are relatively easy to acquire in the marketplace. In contrast, external relationship management, market responsiveness and business partnership capabilities are not available in markets; they must be internally developed over time. The mobility of outside-in and spanning capabilities is expected to be lower than that of inside-out capabilities.

IS outside-in and spanning capabilities have more possibilities than IS inside-out capabilities, to lead a firm into a competitive advantage position based on the analysis of the attributes of the resources. These three types of IS capabilities react with each other and could possibly react with other complimentary capabilities to indirectly help a firm achieve a competitive advantage. However, which factors mediate or moderate this relationship, and the degree to which they do so has not been fully explored by prior

research (Wade & Hulland, 2004). How these three kinds of IS resources influence each other, how they might interact when they all exist in the same firm, are open questions that this study has investigated. The results of this study will provide further evidence to improve our existing understanding of the relationships between these factors.

The relationship between the investment in IS resources and CRM has been studied in the past. Key findings are summarised in the following paragraphs as this study seeks to compare its findings at the present point in time with previous findings due to the evolving nature of CRM practice as well as IS capabilities over time. This study also considers IS resources and CRM capabilities from the standpoint of having a comparative advantage as opposed to just having them in place.

First of all, previous research found that IS investment can have an effect on CRM success but did not separate CRM into CRC and CKC effects. In addition, IS investment was found to have positive direct effects on CRM achievements by some (e.g. Abbott, Stone & Buttle, 2001; Dewhurst, Martinez, Lorente & Dale, 1999; Sin, 2004; Mithas, 2005); but to have a positive indirect effect on CRM success by others (e.g. Karimi Somers & Gupta, 2001; Jayachdran, Sharma, Kaufman & Raman, 2005). Most of the research reviewed for this study has shown the correlations between IS investment and CRM achievements are strong.

Table 2.2 summarises recent studies that have identified the correlations between Investment in IS and CRM. The use of IS-based CRM technologies has been found to increase customer loyalty and financial performance, relative to firms that do not use IS-related CRM technologies (Abbott, Stone, & Buttle, 2001). Karimi, Sommers and Gupta (2001) found IS has a moderate positive effect on performance, when it is supported by proper CRM procedures. The above studies do not distinguish the influences of customer relating capabilities and customer knowledge capabilities, therefore further study is necessary to find out how the correlation between investment in different types of IS resources, separately influences CKC and CRC capabilities; and

indirectly, firm performance.

Secondly, other research on customer relating capabilities claims investments in IS resources, mediated by CRC, have a positive effect on organisational performance (e.g. Sin, Tse & Yim, 2004; Jayachandran, Sharma, Kaufman & Raman, 2005) but these studies do not always distinguish between efficiency and effectiveness as different ways of assessing performance. Thirdly, only a few researchers found that investment in IS resources has a positive effect on financial performance, mediated by CKC (Sin, Tse & Yim, 2004). Dewhurst, Martinez and Dale (1999) pointed out that IS leads efficiency in market analysis, helps firms obtain relevant customer information and to develop new products. In addition, the effect of CRM software applications on customer satisfaction has been shown to be mediated by an improvement in a firm's customer knowledge (Mithas, Krishnan, & Fornell , 2005).

Table 2.2 Summary of the correlation between investment in IS resource and CRM.

Relationship Examined	Findings	Title	Authors
IS investment & CRM (CRC CKC)	IS technology moderately increases customer loyalty and financial performance when they start to use IS technologies (mainly database, web-based applications and email).	Customer relationship management in practice – a qualitative study	Abbott, Stone, and Buttle (2001)
IS investment & CRM from the perspective of Total Quality Management	IS leads efficiency in market analysis, helps firms obtain relevant customer information and to develop new products (CKC focused).	Total quality management: Origins and evolution of the term	Dewhurst, Martinez ,Lorente and Dale (1999)
IS management practice & customer service	IS has moderate positive effects on performance, when it is supported by proper CRM (CRC & CKC are not distinguished) procedures. IS can potentially lead to increased customer satisfaction/retention when firms do the following: (1) define specific goals and objectives for improving customer service, (2) understand what attributes customers are looking for while using IS-based services, (3) design IS-based services to provide customers with personalized experiences, and (4) define metrics to be used by project managers to measure customer perceptions of the service. The correlation is strong.	Impact of Information Technology Management Practices on Customer Services	Karimi, Somers, and Gupta (2001)
CRM (customer focus, CRM organisation, knowledge management and IS-based CRM) and marketing performance (trust & satisfaction) and Financial performance	CRM has a strong positive effect on marketing performance and a relatively moderate positive effect on financial performance.	CRM: conceptualization and scale development	Sin, Tse and Yim (2004)
Managerial IS knowledge & the performance of the firm's customer service process	Managerial information technology knowledge has a strong positive relation to the performance of that firm's customer service process.	Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view	Ray, Barney and Muhanna (2004)

Relationship Examined	Findings	Title	Authors
CRM-involved-processes, CRM technology (IS supported) and CRC performance	CRM technology (IS supported) has a positive moderating influence on the association between relational information processes (information reciprocity, information capture, information integration, information access, and information use) and customer relationship performance (Effectiveness only)	The Role of Relational Information, Processes and Technology Use in Customer Relationship Management	Jayachdran, Sharma, Kaufman, and Raman (2005)
Customer relationship management applications (Invest in IS), CKC and Efficiency (customer satisfaction)	Effect of CRM applications on customer satisfaction is mediated by an improvement in firms' customer knowledge. The correlation is strong.	Why Do Customer Relationship Management Applications Affect Customer Satisfaction?	Mithas, Krishnan, and Fornell (2005)

Since Wade and Hulland (2004) propose that spanning capabilities, involving both internal and external analysis, are required to integrate a firm's inside-out and outside-in capabilities, support for the following hypothesis is expected.

H1. *A comparative advantage in IS spanning capability will mediate the influences of a comparative advantage in both IS inside-out capability and IS outside-in capability on customer relationship management resources (i.e. customer relating capability and customer knowledge capability).*

Direct Effect or Contingent Effect on Organisational Performance (Effectiveness and Efficiency)

As mentioned above, a comparative advantage in inside-out, outside-in and spanning resources could help to create a competitive advantage and to sustain the advantage. However, the RBV inadequately considers the fact that resources rarely act alone in creating or sustaining competitive advantage. In almost all the former research this study reviewed, IS resources acted in conjunction with other firm resources (both assets

and capabilities) to improve performance (e.g. Powell & Dent-Michallef, 1997; Benjamin & Levinson, 1993; Ravichandran & Lertwongsatien, 2002). This brought up several other questions addressed in this study: Do other capabilities also react with IS resources (inside-out, outside-in, spanning) as mediators to create competitive advantage? When the other capabilities exist, do IS resources directly or indirectly (contingently) affect the firm's performance? If they do have an effect, is the effect on effectiveness different from the effect on financial performance?

The issue of complementary resources is vital since it implies a more complex role for IS resources within the firm (Alavi & Leidner, 2001). It is similar to the role between IS software and hardware. Without IS software, IS hardware is useless. IS capabilities play an interdependent role with other firm resources (Keen, 1993; Walton, 1989). It can generate competitive value only if it reacts well with pre-existing business and human resources (Jarenpaa & Leidner, 1998). The effects between complementary resources take three forms (Black & Boal, 1994): compensatory, enhancing, or suppressing/destroying. A compensatory relationship exists when a change in the level of one resource is offset by a change in the level of another resource; an enhancing relationship exists when one resource magnifies the impact of another resource; a suppressing relationship exists when the presence of one resource diminishes the impact of another.

In this study, customer relating capability and customer knowledge capability are considered complementary resources, since they may utilise IS resources both to communicate with customers and to gather and process customer information. How CRC and/or CKC will compensate, enhance or suppress the impact of IS resources requires further study. Therefore the differential effects of the three types of IS capabilities on each type of firm performance were investigated in this study.

Prior research on strategic information technology (SIT), not based on RBV theory, also provides evidence of a relationship between IS resources, complementary resources and

performance. A review of literature in this area demonstrates that possession of superior IS resources (i.e. a comparative advantage) is not inevitably linked to enhanced performance (Wade & Hulland, 2004). The majority of the studies reported either a direct positive or indirect (i.e. contingent) effect on performance (see Table 2.3), while only a few studies found a direct negative effect or no effect.

Table 2.3 Summary of the effects of strategic information technology on performance.

Outcome Effect	**Relevant Studies**
Direct Positive Strategic information technology has a direct and positive effect on competitive advantage or performance	Banker and Kauffman (1991); Bharadwaj (2000); Clemons and Weber (1990); Floyd and Woolridge (1990); Jelassi and Figgon (1994); Mahmood (1993); Mahmood and Mann (1993); Mahmood and Soon (1991) Roberts et al. (1990); Silverman (1999); Tavakolion (1989); Tyran et al. (1992); Yoo and Choi (1990).
Direct and Negative	Warner (1987)
No Effect	Sager (1988); Venkatraman and Zaheer (1999)
Contingent Effect The effect of strategic information technology on competitive advantage or performance depends on other constructs	Banker and Kauffman (1988); Carroll and Larkin (1992); Clemons and Row (1988); Clemons and Row (1991); Copeland and McKenny (1988); Feeny and Ives (1990); Henderson and Sifonis (1988); Holland et al. (1992); Johnston and Carrico (1988); Kettinger et al. (1994); Kettinger et al. (1995); King et al. (1989); Lederer and Sethi(1988); Li and Ye (1999); Lindsey et al. (1990); Mann et al. (1991); Neo (1988); Powell and Dent-Micallef (1997); Reich and Benbasat (1990); Schwarzer (1995); Short and Venkatraman (1992).

Whether a comparative advantage in IS capabilities leads to a comparative advantage in CRM resources and better performance both directly and indirectly (i.e. partial mediation), or influences performance only indirectly through interactions with other constructs (i.e. full mediation), is investigated in this study. This study predicts that superior customer relating capability and superior customer knowledge management capability will mediate between a comparative advantage in IS capabilities and firm performance. Support for the following hypothesis is expected.

H2: Comparative advantages in *Customer Relating Capability (CRC) and Customer Knowledge Capability (CKC) will mediate the relationships between comparative*

advantages in IS Spanning capabilities and organisational performance measured as effectiveness and efficiency respectively.

CRC, CKC and Information Privacy Protection Capability

As discussed earlier, a comparative advantage in CRM resources can be viewed in terms of CRC and CKC. In the case of CKC, customer information is primarily used as a means to learn about ways to address immediate or to predict future customer preferences in order to provide tailored products and services that match customer needs. In the case of CKC, customer information is primarily used internally to support organisational innovation and change (Brumagin, 1994). Firms gather customer information to learn something they might not know and the learning is applied to achieving other goals. The purpose for collecting customer information in firms that seek to develop a CKC capability differs from that of firms seeking to develop a CRC capability, distinguishing two different types of CRM oriented organisations.

Organisations that view customer information as an external resource for building trust seek to develop a comparative advantage in their customer relating capabilities to acquire new customers and to maintain a long-term relationship with these customers in order to improve customer retention levels. Performance is measured in terms of effectiveness for this type of organisation (Greenaway & Chan, 2005). They try to treat customer information as a resource and as a unique asset. Customer information would be used to improve understanding of particular target segment needs, emerging trends and as a basis for future offerings based on needs articulated by customers rather than internally generated suggestions for change. Such organisations seek to collect relevant, useful and timely information but take potential privacy concerns into consideration. Firms in this group apply fair information practises to their information management processes and only collect necessary information. The capability, being used to achieve competitive advantage by this group, is the ability to build strong relationships to gain trust and loyalty (Barney & Hansen, 1994; Jarvenpaa & Leidner, 1998). Here competitive advantage refers to the achievement of effectiveness.

Organisations that view customer information as an internal resource use their customer knowledge management capabilities to develop superior products or personalised offers and measure competitive advantage in efficiency terms. These firms try to collect as much customer information as possible in order to better target their marketing efforts. They try to achieve higher efficiency via minimisation of costs or maximisation of profitability. In terms of consideration of privacy, this group of firms tries to minimise interference with the collection and processing of the data needed to build comprehensive customer profiles. Firms in this group routinely collect as much information as they can; but the clear use of all the customer information, they collect and integrate from multiple sources, may not be fully disclosed to their customers. Developing a comparative advantage, in the ability to track and predict changing customer preferences, is used to achieve competitive advantage in this group of firms (Bhardawaj, 2000). Their competitive advantage refers to the achievement of efficiency. Linking the above assumption with competitive advantage theory, external focus on customer relating capability, and internal focus on customer knowledge capability are identified as two mediators between IS capability (e.g. inside-out, outside-in and spanning capabilities) and organisational performance (e.g. efficiency and effectiveness).

In the effectiveness-focused group, who seek to maintain a long-term relationship with customers, there may be a greater incentive to explain their privacy practices whenever they need to ask customers for information (Greenaway & Chan, 2005). They might invite customers to participate in information-based programmes and specify how they use different information for different purposes. This group of firms seeks permission to share customer information with other internal business units and they treat customers' privacy as an external resource. They try to satisfy customers' concerns on privacy by pursing Fair Information Practices (FIPs) and pursue opt-in rather than opt-out policies since the former are permission based and require less effort from the customer. Building trust with customers is a high priority so such firms might seek to exceed

industry guidelines.

In contrast, in the efficiency-focused group, to achieve efficient use of customer information may place a lower priority on privacy protection viewing the benefits of collection and use as outweighing potential privacy concerns (Greenaway & Chan, 2005). These firms try to collect as much information as they can and may not always disclose all purposes for collection to customers when they ask for customer information. The collected information may be shared with internal units, without gaining further permission from customers, as they assume the customer information belongs to the company once collected. They may also try to satisfy basic customer concerns on privacy by pursing FIPs but are more likely to take a compliance view, by only just meeting the basic requirements and to use opt-out rather than opt-in policies for their own convenience. Using customer information efficiently is more likely to be given a higher priority than privacy protection.

Firms may primarily seek to achieve a comparative advantage in customer relating capability or a customer knowledge capability to in order to achieve a competitive advantage in the sense of superior performance. Equal weight may not be given to both capabilities at the same time due to the different value systems behind each capability (Greenaway & Chan, 2005); they apply different methods for handling customer information. In turn, competitive advantage is measured in terms of effective performance or efficient financial performance respectively. Therefore support for both of the following hypotheses is expected.

H3a: *Information privacy protection capability partially mediates the positive impact of CRC on effectiveness.*

H3b: *Information privacy protection capability will not mediate the positive impact of CKC on efficiency.*

Jayachandran, Sharma, Kaufman, and Raman (2005) found that CRC has a positive moderating influence on the association between relational information processes (information reciprocity, information capture, information integration, information access, and information use) and customer relationship performance (effectiveness only). Relational information processes provide guidelines to help firms manage customer information and interact with customers in ways that are consistent with the demands of CRM. These processes are necessary to enhance customer relationship performance while CRM technology performs a supportive role. Their conceptualisation of relational information process indicates a relationship between CKC, CRC and Effectiveness may exist. Therefore the following hypothesis is proposed:

H4: *CRC and IPP will have an enhancing, mediation effect on the relationship between CKC and organisational effectiveness.*

The relationship between CRC and CKC requires some further explanation. Knowledge management (KM) has become a fundamental capability for organisations to manage their knowledge resources more efficiently. CKC is considered to be made up of the following two types of knowledge (Rowley, 2002): knowledge about customers and knowledge possessed by customers. The knowledge about customers includes knowledge about potential customers and customer segments as well as knowledge about individual customers (Rowley, 2002). The knowledge possessed by customers includes knowledge about product ranges such as compatibility between computer hardware or of features of different products. Some existing research has focused on the second definition, without treating customer knowledge as aggregate information about the market (Bose & Sugumaran, 2003). This study only focuses on the first definition. CKM generates, disseminates and uses customer knowledge within an organization and between the organization and its customers (Rollins & Halinen, 2005). Its goal is to learn about, from and with customers in order to support customer relationship management efforts.

Previous empirical research has not always distinguished between CRC capability and CKC in terms of how they mediate the IS resource to performance relationship, but it has suggested that CKM can improve CRC. Nevertheless, from the perspectives of Greenaway and Chan (2005), CRC is distinct from CKC as they arise from different organisational focuses on effectiveness or efficiency as primary. Differences in business goals may lead firms to focus on different capabilities to achieve those goals. Some research also shows that superior customer relationship management practices can lead organisations to superior performance in terms of effectiveness which in turn will enhance financial performance (Ramaswami, Bhargava, Srivastava, 2004). Effective CRC means having satisfied customers and higher retention of existing customers. Existing customers provide higher returns and cost less to service than newly acquired customers which may lead to greater firm profitability. The firm Accenture examined 54 CRC capabilities in marketing, sales, and customer service. They found CRM process effectiveness had a strong impact on a company's profits (Salz-Trautman, 2000). Therefore support for the following hypothesis is expected.

H5: *Effectiveness has a direct positive influence on efficiency.*

Summary

This chapter reviewed the literature relevant to developing the theoretical framework tested in this study. RBV theory, its extensions and findings from prior tests of RBV theory underlie the research hypotheses about the possible mediation effects of information privacy protection capability, customer relating capability, customer knowledge capability and CRM effectiveness on the relationship between IS resources and organizational efficiency. The next chapter describes how the survey research method was used to collect data to measure the variables associated with each theoretical construct and the procedures used to analyze this data to assess the level of support for the research hypotheses stated in this chapter.

Chapter 3: Research Method

This study uses a cross-sectional survey research design to empirically measure the constructs and test the relationships between the constructs discussed in Chapter 2. This chapter describes the research design, justifies the choice of research method and describes the data collection and data analysis procedures followed by the study. Data collection procedures consisted of determining the population to be studied, how to gather an appropriate sample, acquiring permission to conduct the study from the Massey University Human Ethics Committee (MUHEC), developing a survey instrument, pre-testing the instrument, conducting the survey and preparing the data sets from the completed questionnaires. Data analysis procedures consisted of computing descriptive statistics about the sample followed by the use of partial least squares regression to assess both the measurement model (i.e. reliability and validity of the measurement items) and the structural model (i.e. support for hypotheses outlined in Chapter 2). The following sections discuss why a survey research design was appropriate and provide detail on the data collection and analysis procedures followed in this study.

Rationale for the Research Design

The objective of the study was to improve our understanding of how IT capabilities, customer knowledge capabilities, customer relating capabilities and organisational privacy protection capabilities interact to influence performance in the context of New Zealand organisations engaged in IT-supported customer relationship management activities. To achieve this objective, the constructs and relationships, shown earlier in the RBV theory based research model, needed to be measured and tested on a sample from this population. A survey research design was deemed appropriate since it provides an efficient way of measuring trends, attitudes or opinions of a population by studying a sample in order to generalise the findings to a population with similar characteristics

(Creswell, 2003). However, in terms of external validity, the only way a researcher can generalise a theory to a new context, is by testing and confirming support for it in the new context (Lee & Baskerville, 2003). This study seeks to determine whether RBV theory can be generalised to the context of New Zealand organisations engaged in CRM who are subject to complying with industry guidelines for handling personal information based on the New Zealand Privacy Act of 1993.

Surveys are particularly useful in determining the actual values of variables under study, and the strengths of relationships among them making them useful for theory testing and extension provided the researcher understands what can and cannot be said about how theoretical constructs relate (Newsted, Chin, Ngwenyama, & Lee, 1996). In this study, an extension (i.e. role of IS Capability and Information Privacy Protection Capability) of a well developed theory (i.e. RBV theory) is examined in a new context to determine how well the theory describes and explains organisational level information privacy protection behaviour in the context of IT-supported CRM in New Zealand. Antecedents (i.e. Comparative advantage in IS Inside-out Capabilities, IS Outside-in Capabilities, IS Spanning Capabilities, Customer Knowledge Capabilities, Customer Relating Capabilities, and Information Privacy Protection Capabilities) and outcomes (i.e. Comparative competitive advantage in efficiency and/or effectiveness) were measured using multiple question items for each of these constructs. A copy of the survey instrument appears in the Appendix.

Data Collection

The unit of analysis in this study is an organisation belonging to the population of organisations engaged in IT-supported CRM activities within New Zealand and therefore subject to New Zealand privacy laws and likely to be aware of industry guidelines on organisational level privacy protection. The constructs in the theoretical model described in Chapter two have all been measured at the organisational level using multiple question items with five point scales. This section outlines the sampling

strategy used and discusses the procedures followed to ensure ethical standards were met. It details the procedures followed in designing and pre-testing the survey instrument and ends with a discussion of procedures and techniques used to analyse the responses.

Sampling Strategy

Ideally, a random sample would be drawn from a list of organisations constituting the population of interest noted above. However, since such a list (i.e. sampling frame) was not available, an alternative sampling strategy was required. The Association of New Zealand Advertisers (ANZA) and New Zealand Marketing Association (NZMA) were contacted to gain permission to request participation from their respective memberships. ANZA agreed to distribute paper copies of the questionnaire to all members along with a cover letter (see the appendix) which stated the requirements for participation and indicated the measures to be taken to safeguard participant responses. The NZMA allowed us to put up a link to the online version of the survey instrument on their Web site and sent out a notice about the survey to their membership via email. The NZMA publishes, on their Web site, the data handling guidelines (Data Advisory Network, 2007b) referred to in the survey instrument and has a special interest group on e-Marketing. It also runs a Data Advisory Network (DAN) whose mission is:

"To provide relevant and pragmatic guidelines for marketers and business decision--makers on the gathering, manipulation, storage and use of data. We deliver this expertise through interactive forums, resource centres and access to leaders in the industry."

DAN's key objectives for 2007 were to provide:

- **Direction**: Develop the DAN resource centre by producing best-practice guidelines on a range of data topics
- **Awareness**: Position DAN as the authority and first point of reference for data guidelines and education in New Zealand
- **N-lightenment**: Provide practical education on relevant data topics

(Data Advisory Network, 2007b)

The cover letter indicated the survey should be completed by managers from New Zealand organisations with experience in IT-related Customer Relationship Management (CRM). Employees in a managerial position with such experience were deemed more likely to have an understanding of organisational policy, procedures and strategy in terms of the customer knowledge/relationship management function as well as their organisation's position relative to others in terms of assessing comparative advantage. Managers from international organisations engaged in CRM activities with a branch in New Zealand were also invited to participate in the survey since these organisations must also abide by the New Zealand Privacy Act of 1993. The researcher also randomly contacted organisations via phone calls to ascertain whether or not they engaged in IT-supported CRM activities in New Zealand. These organisations were selected from the 2006 list of New Zealand's top 200 firms, published annually in New Zealand Management magazine and in the Factiva database.

Ethical Issues in Accessing Participants

Prior to distributing materials to potential respondents, ethical approval was sought and gained. The procedures involved included reading Massey University's code for conduct of ethical research, completion of the screening questionnaire to determine the type of application and submission of the appropriate forms (MUHEC, 2006). The Massey University Human Ethics Committee (MUHEC) categorized the study as a low-risk study and granted approval to proceed with data collection on 10 May 2006. The following statement appeared on the cover letter and online introductory information page provided to potential participants.

"*This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher is responsible for the ethical conduct of this research. If you have any concerns about the conduct of this research that you wish to raise with*

someone other than the researcher, please contact Sylvia Rumball, Assistant to the Vice-Chancellor (Ethics & Equity), telephone 06 350 5249, email humanethicspn@massey.ac.nz."

In addition, a paragraph appeared at the end of the survey which thanked respondents for participating and asked for an email address if they wanted a copy of the results sent to them at the end of the study. They were also told the confidentiality of responses would be ensured by separating the email address from the rest of the response data.

Questionnaire Design and Construct Measurement

The survey instrument uses multiple items to measure each latent construct shown in the research model discussed in Chapter two. All measures, except those of information privacy protection capability, were selected from previously validated survey instruments. The following paragraphs discuss the choice of measurement items (i.e. questions on the survey instrument) for the dependent latent variable (i.e. efficiency of organisational performance), the intermediate (or mediating) dependent latent variables (i.e. effectiveness, customer knowledge capability, customer relating capability, information privacy protection capability, IS outside-in resources, IS spanning resources) and the independent latent variable (i.e. IS inside-out resources).

Wade and Hulland (2004) made the following three recommendations for measuring a dependent variable representing competitive advantage in empirical studies based on RBV theory: (1) it should provide an assessment of performance, (2) it should incorporate a comparative element, relative to key competitors, and (3) it should address the notion of performance over time. All questions for measuring the dependent and mediating latent variables were worded with a sense of comparativeness by including the phrases "compared with others in your industry" or "relative to your most competitive opponent/direct competitor", so as allow an assessment of resources or performance relative to others in the same industry. Questions designed to measure effectiveness or efficiency of performance contained the phrase "over the last two

years" to incorporate an element of time. Similarly, Bharadwaj (2000) tracked return on assets (ROA) over a 4 year term and Jarvenpaa and Leidner (1998) used a 2 year period. This study uses a 2 year period to measure the organisational performance according to Wade and Hulland's suggestions. Considering that there is no existing ROA data to track directly, a 2 year period is reasonable as long as the participants have worked in the same firm over 2 years.

Measures of organizational performance in terms of both effectiveness and efficiency were obtained from Moorman and Rust (1999). Efficiency of performance was measured in terms of return on assets (ROA), profitability, market share, sales, net operating margin, and ability to charge price premiums for products/services. Effectiveness of performance was measured as the ability to handle customer complaints, customer satisfaction level, ability to retain customers, ability to improve image/reputation and ability to increase the number of relationships with customers. Bharadwaj (2000) and, Robins and Wiersema (1995) also recommend using Return on Assets (ROA), as well as sales and market share as performance metrics for measuring strategic competitive advantage.

Measures of IS capabilities were adopted from Bharadwaj, et al. (1998) and grouped into outside-in, inside-out and spanning resources (Wade & Hulland, 2004). Measures of outside-in capabilities included questions on external IS links with customers and suppliers as well as 2-way collaborations. Measures of inside-out capabilities included items on IS infrastructure capabilities and the ability to integrate IS and business strategy. Measures of spanning resources included items on IS management capabilities and IS business processes. Measures of customer relating capabilities (CRC) and customer knowledge capabilities (CKC) were adopted from Ramaswami, et al. (2004) and Moorman (1995). Wade & Hulland (2004) classified CRC as outside-in resources and CKC as inside-out resources. These capabilities were treated as separate constructs in this study in order to determine how each of the three types of IS capabilities interacted with the two types of CRM capabilities.

The measures of information privacy protection capability were developed specifically for this study using a pre-test and small pilot study discussed in the next sub-section. The final survey instrument appears in the Appendix.

Pre-testing and Pilot Study

A pre-test was conducted to identify potential problems with the questions on information privacy protection capability designed by the researcher. The pilot test involved participation by staff from several public relations agencies, an insurance company and some marketing managers from different types of organisations. All the organisations involved make use of customer information and IT-supported communications with customers. Participants from the public relations agencies and insurance company represented organisations more likely to focus on customer relating capabilities while the marketing managers represented organisations with a greater focus on internal, customer knowledge management.

The questions on organisational privacy protection practices were re-designed to eliminate the questions which seemed to contain social bias based on discussions with the pre-test participants. Several problems with question wording were identified and the questions were revised to relate practices to the guidelines provided by the New Zealand Marketing Association's Data Advisory Network group (Data Advisory Network, 2007a).

A small pilot study with 20 participants was conducted after making revisions to some of the questions based on the pre-test results. Each respondent in the pilot study was asked to complete all the questions and then to discuss the survey with the researcher in terms of what they thought about the questions and whether or not they had any suggestions for improvement. Only minor changes in wording and the use of New Zealand spelling were made at this point. The average completion time was 15 minutes. The respondents indicated the questionnaire was easy to understand, even for the

participants who were not native English speakers. Content validity was assessed by verbally checking with participants to see if the concept they thought was being measured matched the researcher's intent. There was no confusion about what each question was asking. Among the 20 respondents from the pilot test, 4 indicated they were not really aware of their competitor's performance in the market; these respondents were all from small companies (fewer than 6 employees in the organisation at all locations). Generally, most respondents did not appear to over-rate their organisational performance and were willing to discuss the weaknesses in their firm's privacy protection practices.

Conducting the Full Survey

Two factors were considered when designing the full survey. First, different people might have different preferred ways of participating in the survey. Some people prefer a paper-based questionnaire but others may prefer answering questions online and not having to post back their completed questionnaire. Second, it might be more efficient and less error-prone to collect data online as it does not require manual data entry to transfer responses from paper to a data set. Therefore the final set of questions was made available to potential respondents in two forms: 1) a six page paper-based, self-administered survey and 2) an online survey. The online survey form was built using the QuestionPro Web site, a free service for survey researchers which provides some basic descriptive statistics and an analysis of the survey response rate in terms of attempts and completions. Participants were given the option of providing an email address and receiving a summary of the results. Calculation of an accurate response rate is difficult since it was not possible to get an accurate estimate of the total number of potential respondents who saw the survey notice for the online survey.

Paper forms with cover letters were mailed to the 101 members of the Association of New Zealand Advertisers and a link to the online form was placed on the New Zealand Marketing Association's Web site as noted earlier in the discussion of sampling strategy. During the first month, only about 50 responses were received. The advice of a

professional consultant with New Zealand surveying experience resulted in making phone calls to companies as noted in the sampling strategy section and sending personally addressed invitations to participate either online or on paper. Follow-up phone calls were made to organisations who had received the invitation to participate. After 6 weeks, 105 responses had been received. All of these respondents completed all the questions on the form. The non-response rate from the post is 97.1% (98 out of 101) and the non-response rate from telephone contacts and interviews with organisations was 70% (140 out of 200). However, it should be remembered that response rate calculations are only applicable to probability samples, not to non-probability samples where participants are purposefully selected based on their knowledge of the phenomena under study.

Data Analysis

Procedures for analysis of the responses from the survey consisted of simple descriptive statistics to describe the sample based on responses to the demographic and experience questions and the use of a second generation regression technique called Partial Least Squares (PLS) Path Modelling to assess empirical support for the research model discussed in Chapter two.

Descriptive Statistics

SPSS 13.0 was used to calculate the proportion of respondents (i.e. frequency distribution) in each category of response for each of the five questions dealing with demographics (i.e. job title, number of employees, main area of business and type of relationship with most customers) and experience (i.e. years engaged in IT-supported CRM). These descriptive statistics allow for characterising the sample used to test the research model and will impact the external validity of the results (i.e. ability to generalise the results) as noted earlier.

PLS Path Modelling

Partial Least Squares (PLS) analysis was conducted using the PLS-Graph 3.0 software package developed by Wynne Chin (Chin, 1998a, 2001). The PLS-Graph 3.0 software supports the PLS path modelling technique using latent variables (Tenenhaus, Vinzi, Chatelin & Lauro, 2005) developed by Wold (1979, 1982, 1985) and later extended by Lohmöller (1989). It includes the ability to cross-validate path model parameters using either a Jack-knife or a Bootstrap re-sampling procedure. Re-sampling is an alternative to significance testing which can be used to identify confidence intervals based on repeated sampling from the researcher's data set. The Bootstrap re-sampling procedure also assesses construct validity by providing estimates of the average variance extracted (AVE) and composite reliability (CR) for each latent variable. The CR represents a measure of internal reliability which is used to assess convergent validity. CR $\geq$ 0.70 is considered acceptable. The AVE is used as a measure of discriminant validity. An AVE $\geq$ 0.50 and exceeding all other correlations between latent variables is considered acceptable (Gefen, Straub & Boudreau, 2000).

PLS path analysis is a second generation, variance-based, regression technique which makes minimal assumptions about measurement scales, residual distribution and sample size (Chin, 1997; Gefen, Straub & Boudreau, 2000). This is in contrast to covariance-based structural equation modelling techniques (i.e. supported by software such as LISREL, EQS or AMOS) commonly used with maximum likelihood parameter estimation which assumes multivariate normality (Bagozzi & Fornell, 1982). PLS is intended for causal-predictive analysis of research models of high complexity (Chin, 1997). PLS can be used to test for statistical conclusion validity, that is, to assess the mathematical relationships between variables proposed in the research model in terms of checking appropriate statistics prior to drawing conclusions about the population of interest from the sample (Straub, Boudreau & Gefen, 2004). PLS can be used to confirm support for strong theory, to suggest where relationships might or might not exist and to suggest propositions for further testing (Chin, 1997). RBV theory has been widely tested and supported in other contexts (Wade & Hulland, 2004). This study seeks to

improve our understanding of how well RBV theory explains the role of IS capability (outside-in, inside-out & spanning resources), information privacy protection capability, customer knowledge capability and customer relating capability in terms of their influence on organisational performance. Therefore, PLS analysis was used in a confirmatory mode in this study in order to determine if the data provides empirical support for the proposed research model in the context of the sampled population. Furthermore, PLS is preferred to LISREL analyses when 1) multivariate normality may be violated, 2) sample size is small and 3) the research model is complex with many parameters (Bagozzi & Yi, 1994).

PLS analysis was used to examine both the adequacy of the measurement (outer) model and to assess the structural (inner) model. The structural model test represents the testing of the hypotheses outlined in Chapter two. PLS combines a factor analysis of the measurement items with linear regression to examine the fit of the structural model (Gefen, Straub & Boudreau, 2000). Figure 3.1 summarizes the major data analysis procedures followed in this study. It should be noted that PLS tends to overestimate the measured item to latent factor loadings and underestimate path coefficients between latent variables relative to co-variance based SEM. However, since the purpose of the study is to determine path significance and strength (i.e. support for the hypotheses in the research model), PLS provides a conservative estimate giving the results more credence (Baggozzi & Yi, 1994). Increasing the number of items per construct (3 or more) and increasing the sample size can be used to improve the accuracy of the item to latent factor loadings (Gefen, Straub & Boudreau, 2000). In this study, three or more items were used for each latent factor and the sample size was within guidelines (i.e. 105 is more than 10 times the largest number of inner paths related to any one factor).

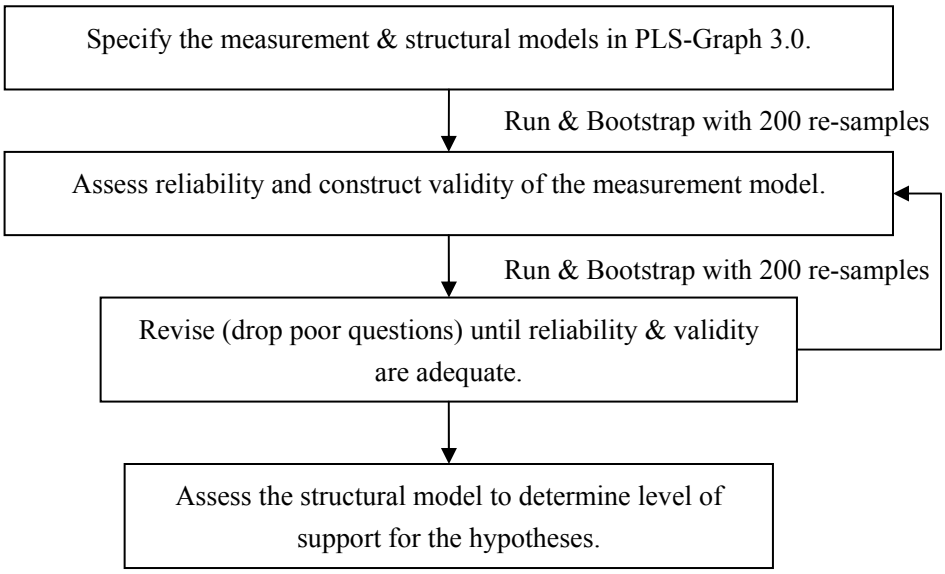

Figure 3.1 Steps followed in Partial Least Squares Path Modelling.

Model Specification in PLS-Graph 3.0

PLS estimation is an iterative process which minimizes the residual variance of all dependent variables when estimating unknown parameters in the model. Therefore, PLS analysis is less sensitive to small sample size (Chin, 1998a). PLS requires the sample size to be at least ten times the largest number of structural (inner model) paths directed at a latent variable (Chin, 1998a) or at least ten times the largest number of measurement items in the most complex first order construct (Thompson et al., 1995). In this research, the sample size of 105 is adequate, since the largest number of structural paths directed at one construct in Figure 3.2 is 4 (i.e. a minimum sample size of 40). The maximum number of measures per first order construct was 6, requiring a minimum sample size of 60. Table 3.1 shows the number of measurement items per first order construct. All direct effects were tested in cases where mediation was expected but these paths are not shown in Figure 3.2.

All second order constructs were measured reflectively by all the items used to measure their first order constructs (Chin, 1998a). All paths from measurement items (i.e.

questions on the survey instrument) to latent variables were modelled as reflective paths. The assumption is the measurement items are significantly correlated with each other within each latent construct. In other words, an increase in the measured item implies an increase in the unobserved, latent variable as well as the other measured items (Chin, 1998b). This was confirmed during the analysis by checking for significant positive correlations between the measured items within each latent construct. Both Cronbach's alpha and the composite reliability (CR) of each latent construct are reported in the results on the measurement model. Cronbach's alpha assumes equal weights for all items while the CR allows for differential weights (Straub, Boudreau & Gefen, 2004). Details on these statistics are discussed in the measurement model assessment section.

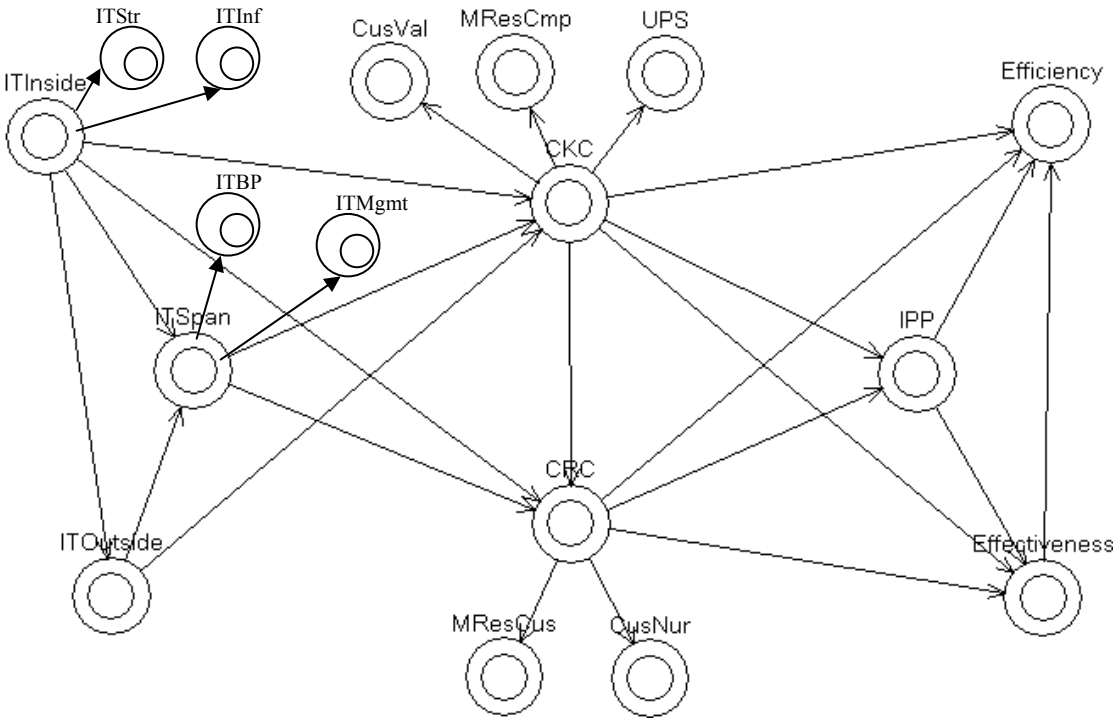

Figure 3.2 Specification of the path model.

Table 3.1 Original number of measurement items for each latent construct.

Second Order LVs	First Order LVs	Number of Items	Question Source
IT Inside-out (IT Inside)	IT Strategy (ITStr)	6	Bharadwaj et al., 1998
	IT Infrastructure (ITInf)	6	Bharadwaj et al., 1998
IT Spanning (IT Span)	IT Business Process (ITBP)	5	Bharadwaj et al., 1998
	IT Management (ITMgmt)	4	Bharadwaj et al., 1998
	IT Outside-In (ITOut)	3	Bharadwaj et al. , 1998
CKC (Customer Knowledge Capability)	CusVal	5	Ramaswami et al. , 2004
	MResCmp	2	Ramaswami et al., 2004
	UPS	5	Ramaswami et al., 2004
CRC (Customer Relating Capability)	MResCus	3	Ramaswami et al., 2004
	Customer Nurturing (CusNur)	5	Ramaswami et al., 2004
	Information Privacy Protection (IPP) Capability	6	Developed by the thesis writer
	Efficiency	6	Moorman & Rust, 1995
	Effectiveness	5	Moorman & Rust, 1995

Customer knowledge capability (CKC) Customer relating capability (CRC), IT Inside-out resources, and IT spanning resources were originally treated as second order factors as per the research model and recommendation of Wade and Hulland (2004) discussed in Chapter 2. Second order factors reflect the common aspects of their first order factors. The following run, output and re-sampling settings were used when running the model, shown in Figure 3.2, in PLS-Graph 3.0.

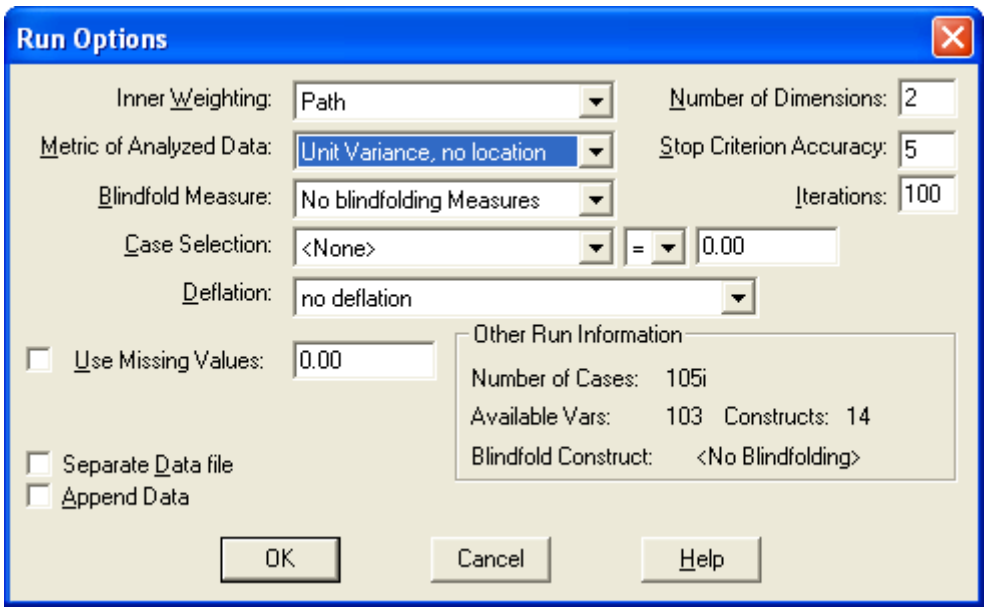

Figure 3.3 Run options used in the PLS-Graph 3.0 model specification.

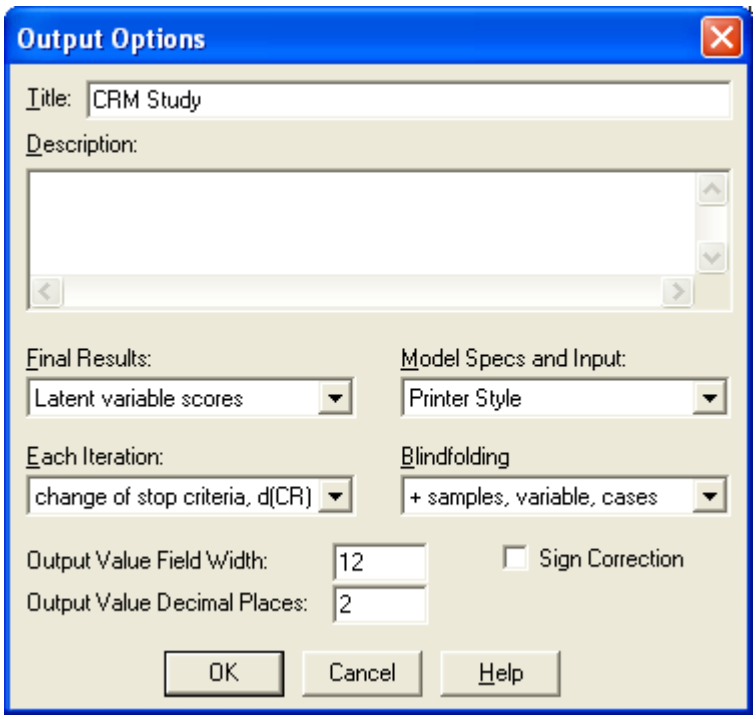

Figure 3.4 Output options using LV scores to assess construct validity.

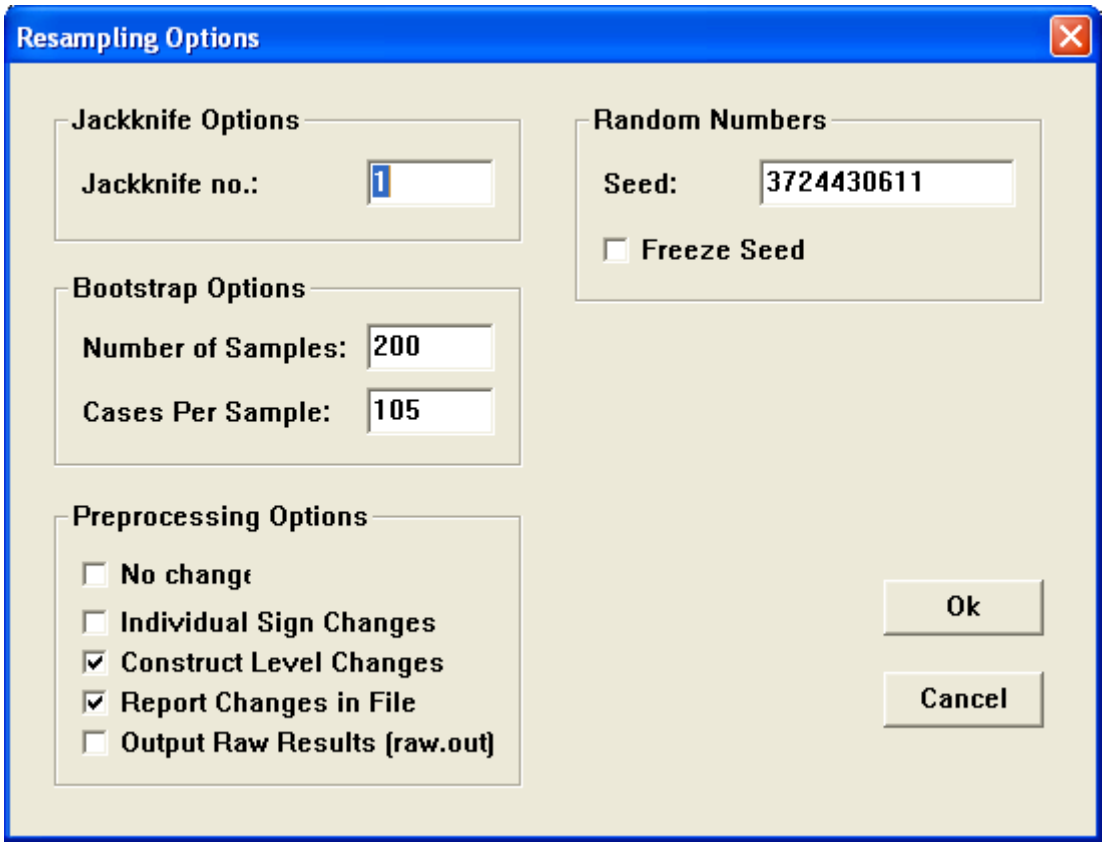

Figure 3.5 Re-sampling options used for the Bootstrap procedure.

The PLS analysis was conducted in two major steps: 1) assess the measurement (outer) model in terms of question reliability and construct validity, dropping items which do not meet the cut-off criteria and 2) evaluate the structural (inner) model to determine support for the research hypotheses stated in Chapter two.

Measurement (Outer) Model Procedures and Assessment

Fit or quality of the measurement model is viewed as acceptable if most of the standardized item to latent construct loadings are greater than or equal to 0.60 (Chin, 1998b), construct reliability (i.e. composite reliability or CR) is greater than or equal to 0.70 and, discriminant and convergent construct validity can be established. Convergent and discriminant validity are acceptable if the following two conditions hold: 1) the square root of the Average Variance Extracted (SQRT(AVE)) of each construct exceeds its correlation with all other constructs and 2) each item has a higher loading on its assigned construct than on all other constructs (Gefen, Straub & Boudreau, 2000). The results of these analyses are discussed in Chapter 4.

PLS-Graph 3.0 was used to compute these statistics. Each run produced an output file which reported item to factor loadings and the average communality of each latent construct. Items which did not load significantly on the first order factor they were meant to measure, with a value greater than or equal to 0.50, were dropped from the model (Chin, 1998b; Gefen, Straub & Boudreau, 2000) after the first run. Bootstrapping in PLS-Graph 3.0 with 200 re-samples and construct level sign change adjustment, as recommended by Tennenhaus et al. (2005), was used to calculate t-values, standardized item to factor loadings, average variance extracted (AVE) and composite reliability (CR). Loadings and communalities were reassessed after each run, dropping items with loadings under 0.60 until each construct's communality equalled or exceeded 0.30 (Falk, 1987). This iterative procedure resulted in dropping a number of items from the measurement model. The communality of a latent construct is a measure of the average proportion of variance of the measurement items explained by the latent variable they

are associated with (Tenenhaus et al., 2005). The AVE measures the variance captured by the construct relative to the amount due to measurement error (Fornell & Larcker, 1981). The resulting statistics for the initial and final measurement model are summarised in Chapter 4, under the section on measurement model results.

Cronbach's alpha was calculated as a measure of construct reliability, using SPSS 13.0, for each block of measurement items (i.e. each set of items associated with a particular latent construct). The Cronbach's alpha is commonly reported in both SEM and PLS studies. It should exceed 0.60 to indicate adequate internal reliability of the measurement items in exploratory work where theory is being tested in a new context (Nunnally & Bernstein, 1994). The composite reliability should exceed 0.70 (Gefen, Straub & Boudreau, 2000). CR is a better measure of reliability when using PLS since, unlike the Cronbach's alpha (a first generation measure associated with regression), CR allows for differential weights of the measurement items.

Structural (Inner) Model Assessment

Goodness of fit of the structural model in PLS is established if the proposed inner model paths are significant ($p \leq 0.05$; $t \geq 1.96$), structural path loadings exceed 0.20 (Chin, 1998b), and the dependent latent constructs have reasonable R^2 values. The R^2 (also called the coefficient of determination, squared multiple correlation or multiple R^2) is a measure of the proportion of the variance of a dependent variable around its mean, explained by the independent variables in the research model. No official cut-off exists for the R^2 but higher values are preferred (Gefen, Straub & Boudreau, 2000).

Chapter Summary

This chapter described and justified the research design in term of data collection procedures and analysis techniques used to assess the quality of the measurements and empirical support for the research hypotheses. The following chapter presents the results of the analysis described above.

Chapter 4: Results

This chapter presents the results of the analysis procedures discussed in Chapter 3. It begins with descriptive statistics about the sample which will be used to qualify (i.e. limit) the interpretation of the results in terms of external validity then discusses the quality of the measurement model. It ends with a discussion of the level of support found for the hypotheses stated in Chapter 2. Descriptive statistics on the respondent organisations are given in the form of percentage of respondents by job title, by organisational size (i.e. number of employees), by years of experience with customer relationship management, by main business area and by primary type of relationship sought with customers (i.e. long-term, mid-term or short-term). The results of the partial least squares (PLS) analysis of the measurement model include a discussion of the internal reliability of the measurements and construct validity. The section on the structural model discusses the level of support found for the proposed hypotheses.

Descriptive Statistics on the Sample

As discussed in Chapter 3, potential respondents were sourced in three ways: letters and paper survey instruments were sent to all 101 members of the Association of New Zealand Advertisers (ANZA), a link to the online version of the survey was posted on the NZ Marketing Association's Web site, and thirdly, the researcher contacted organisations, on the top 200 list of New Zealand firms (using the Factiva database to source contact details), via phone calls and site visits. The response rate from the members of ANZA was only 2.9% (3 out of 101); the response rate from telephone contacts and interviews with organisations was 30% (60 out of 200). The response rate from the link on the NZ Marketing Association's Web site could not be determined since the total number of members who were aware of the link is not known. However, 42 respondents completed the online survey resulting in a total usable sample of 105.

Respondents were limited to employees in a managerial position with an understanding of CRM policy, procedures and strategy. About three-quarters of the respondents were marketing managers, marketing directors or vice-presidents of marketing (see Figure 4.1). The remaining 24.27% of the respondents were in positions such as consultant, marketing project manager, marketing assistant, marketing consultant, retail assistant, manager assistant, senior consultant, senior marketing staff or marketing executive.

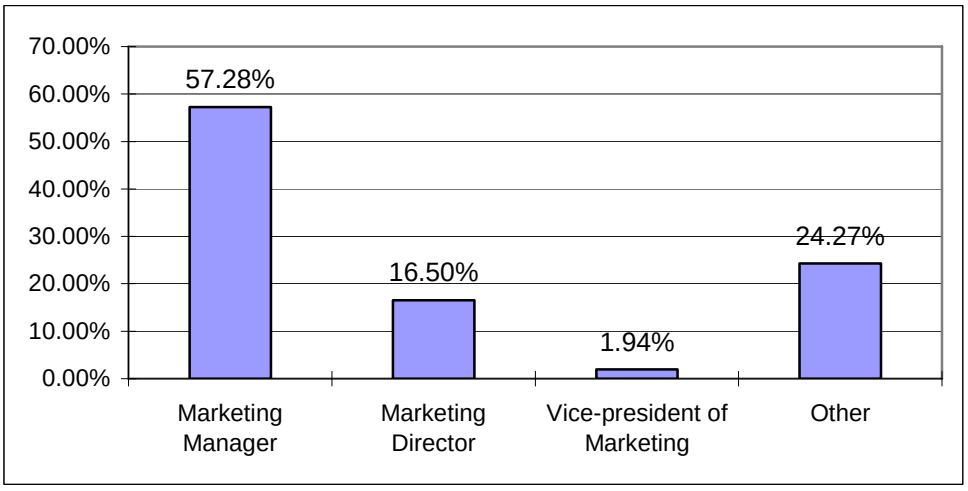

Figure 4.1 Job titles of respondents.

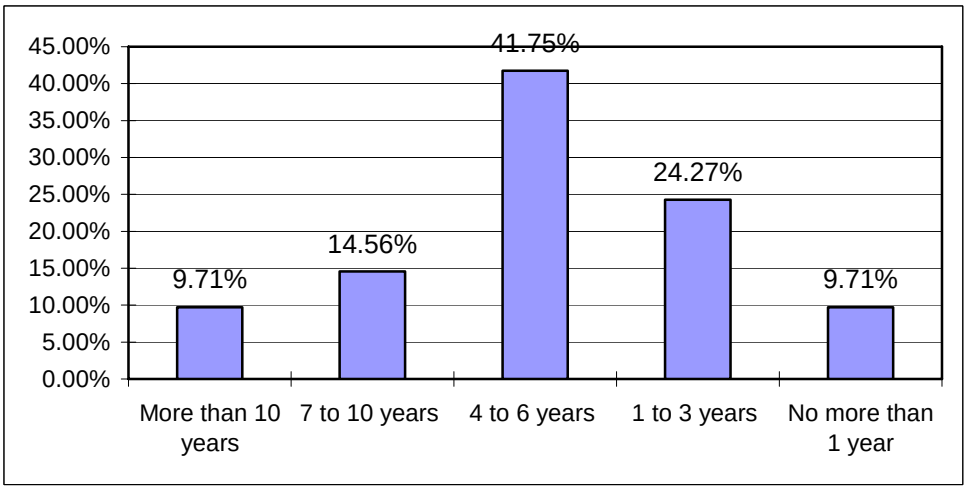

Figure 4.2 Years engaged in IT-supported CRM.

About two-thirds of the respondents had been engaged in IT-supported customer relationship management for 4 or more years (see Figure 4.2) and about one-quarter had

a shorter experience of 1 to 3 years. Nearly half (48.55%) of the respondents were from small to medium sized organisations with less than 100 employees. Table 4.1 compares the sample with the 2006 population of New Zealand organisations (published annually by New Zealand Statistics). As expected, the sample contained a higher percentage of medium to large organisations, organisations assumed to be more likely to be engaged in IT-supported CRM.

Table 4.1 Number of employees in the sample and NZ business population.

	Sample	Population
100 +	51.45%	30.59%
50 - 99	20.39%	12.86%
6 - 49	22.33%	43.64%
Fewer than 6	5.83%	12.91%

Table 4.2 Main area of business in the sample and NZ business population.

	Sample	Population
Communications: Public relations, Ads, etc.	4.90%	33.75% (L – Property & Business Services) 3.76% (A – Agriculture, Forestry & Fishing)
Computer & Data Processing	16.67%	
Chemical or Pharmaceutical	0.98%	
FMCG (Fast Moving Consumer Goods)	9.80%	
Marketing Research	0.98%	
Real Estate	1.96%	
Educational	1.96%	2.20% (N – Education)
Financial Services	13.73%	3.62% (K-Finance & Insurance)
Government or Military (M)	0.00%	0.49% (M – Govt Admin & Defence)
Manufacturing and Processing	5.88%	6.26% (C – Manufacturing) 0.16% (B – Mining)
Medical Services	1.96%	4.50% (O – Health & Community)
Social or Non-profit	1.96%	
Trade: Wholesale	6.86%	5.63% (F – Wholesale trade)
Trade: Retail	8.82%	11.68% (G-Retail trade)
Tourism: Travel Agent, Ticketing	9.80%	7.04% (H – Accommodation, Cafes & Restaurants; P-Cultural & Recreational)
Transportation Services: Land, Sea and Air	5.88%	3.57% (I – Transport & Storage)
Utilities: Communications, Electric, etc.	2.94%	1.00% (D – Elec/Gas/Water; J-Comms.)
Other	4.90%	4.32% (Q Personal & Other Services) 11.94% (E –Construction)

Table 4.2 shows the spread of respondents across industries in the sample and compares the sample distribution with the population of all NZ organisations. Different categories were used in the study relative to the 17 categories (A to Q) reported annually by NZ Statistics (see last column of Table 4.2). Financial services appears to be somewhat underrepresented in the sample while organisations engaged in property, business services, FMCG, trade & tourism appear to be well represented.

The respondents split approximately into thirds in terms of the duration of the relationship sought with their customers. Table 4.3 implies about two-thirds of the respondents were focused on mid to long-term relationships.

Table 4.3 Type of relationship with customers.

Long-term relationship with customers	37.25%
Mid-term relationship with customers	28.43%
Short-term relationship with customers	34.31%

Measurement (outer) Model

Descriptive Statistics

SPSS was used to determine the frequency distribution of the responses to each question and to compare the mean response of each question to the scale mid-point of 3 where 1= very poor/strongly disagree/well below and 5= very good/strongly agree/greatly exceed. The results are summarized in Table 4.4. Items shown in grey in Table 4.4 have p-values < 0.05 so the mean response is not significantly different from the scale midpoint of 3 in these cases. A response of 3 corresponded to either average, indifferent, meeting guidelines or equal to the competition depending on the specific question (see the Appendix for specific questions). The paragraphs following Table 4.4 briefly discuss these results.

Table 4.4 Descriptive statistics on questions.

Question Items	Percentage (%) of Responses					Descriptive Statistics			
	1	2	3	4	5	Mean	t-value	Signif. (2-tail)	S.E. Mean
ITBP1	1.9	13.3	46.7	37.1	1.0	3.22	2.956	.004	.074
ITBP2	3.8	25.7	44.8	23.8	1.9	2.94	-.687	.494	.083
ITBP3	3.8	16.2	47.6	30.5	1.9	3.10	1.292	.199	.081
ITBP4	5.7	16.2	38.1	35.2	4.8	3.17	1.839	.069	.093
ITBP5	3.8	12.4	47.6	33.3	2.9	3.19	2.343	.021	.081
ITExt1	1.9	11.4	25.7	43.8	17.1	3.63	6.686	.000	.094
ITExt2	3.8	7.6	46.7	33.3	8.6	3.35	4.067	.000	.087
ITExt3	1.9	14.3	53.3	22.9	7.6	3.20	2.417	.017	.083
ITStr1	1.0	14.3	25.7	48.6	10.5	3.53	6.076	.000	.088
ITStr2	1.0	9.5	50.5	25.7	13.3	3.41	4.803	.000	.085
ITStr3	2.9	7.6	52.4	34.3	2.9	3.27	3.582	.001	.074
ITStr4	2.9	15.2	40.0	32.4	9.5	3.30	3.316	.001	.092
ITStr5	1.0	13.3	50.5	31.4	3.8	3.24	3.184	.002	.075
ITStr6	2.9	13.3	48.6	31.4	3.8	3.20	2.484	.015	.081
ITMgt1	3.8	6.7	30.5	48.6	10.5	3.55	6.226	.000	.089
ITMgt2	2.9	7.6	49.5	33.3	6.7	3.33	4.124	.000	.081
ITMgt3	0	8.6	39.0	38.1	14.3	3.58	7.078	.000	.082
ITMgt4	1.0	9.5	46.7	35.2	7.6	3.39	4.985	.000	.078
ITInf1	4.8	6.7	37.1	43.8	7.6	3.43	4.837	.000	.089
ITInf2	3.8	11.4	37.1	34.3	13.3	3.42	4.345	.000	.096
ITInf3	1.9	20.0	43.8	27.6	6.7	3.17	1.967	.052	.087
ITInf4	8.6	17.1	42.9	28.6	2.9	3.00	.000	1.000	.094
ITInf5	3.8	21.0	45.7	24.8	4.8	3.06	.653	.515	.088
ITInf6	2.9	18.1	50.5	22.9	5.7	3.10	1.241	.217	.084
MResCus1	2.9	15.2	40.0	31.4	10.5	3.31	3.376	.001	.093
MResCus2	4.8	18.1	42.9	26.7	7.6	3.14	1.517	.132	.094
MResCus3	5.7	15.2	46.7	29.5	2.9	3.09	.988	.326	.087
CusNur1	6.7	10.5	27.6	36.2	19.0	3.50	4.622	.000	.109
CusNur2	4.8	13.3	31.4	41.0	9.5	3.37	3.833	.000	.097
CusNur3	10.5	20.0	39.0	26.7	3.8	2.93	-.669	.505	.100
CusNur4	4.8	21.9	46.7	18.1	8.6	3.04	.402	.688	.095
CusNur5	2.9	20.0	53.3	21.0	2.9	3.01	.122	.903	.078
CusVal1	12.4	12.4	22.9	46.7	5.7	3.21	1.896	.061	.111
CusVal2	9.5	14.3	37.1	36.2	2.9	3.09	.877	.382	.098
CusVal3	4.8	14.3	42.9	29.5	8.6	3.23	2.431	.017	.094
CusVal4	9.5	12.4	38.1	32.4	7.6	3.16	1.569	.120	.103
CusVal5	2.9	21.0	32.4	36.2	7.6	3.25	2.620	.010	.095
MResCmp1	4.8	13.3	35.2	41.0	5.7	3.30	3.219	.002	.092

Question Items	Percentage (%) of Responses					Descriptive Statistics			
	1	2	3	4	5	Mean	t-value	Signif. (2-tail)	S.E. Mean
MResCmp2	1.9	10.5	51.4	30.5	5.7	3.28	3.526	.001	.078
UPS1	5.7	14.3	35.2	40.0	4.8	3.24	2.552	.012	.093
UPS2	3.8	15.2	33.3	38.1	9.5	3.34	3.589	.001	.096
UPS3	4.8	21.0	31.4	34.3	8.6	3.21	2.093	.039	.100
UPS4	6.7	23.8	45.7	21.0	2.9	2.90	-1.182	.240	.089
UPS5	10.5	21.0	36.2	26.7	5.7	2.96	-.367	.715	.104
IPP1		7.6	62.9	24.8	4.8	3.27	4.085	.000	.065
IPP2	2.9	7.6	47.6	39.0	2.9	3.31	4.150	.000	.076
IPP3		22.9	44.8	31.4	1.0	3.10	1.415	.160	.074
IPP4		21.0	51.4	20.0	7.6	3.14	1.749	.083	.082
IPP5	1.9	18.1	48.6	25.7	5.7	3.15	1.832	.070	.083
IPP6	2.9	4.8	47.6	30.5	14.3	3.49	5.530	.000	.088
SCAFin1		11.4	39.0	46.7	2.9	3.41	5.750	.000	.071
SCAFin2	1.0	11.4	42.9	40.0	4.8	3.36	4.718	.000	.077
SCAFin3	1.0	20.0	43.8	30.5	4.8	3.18	2.205	.030	.082
SCAFin4	1.0	16.2	41.0	35.2	6.7	3.30	3.647	.000	.084
SCAFin5		17.1	40.0	34.3	8.6	3.34	4.066	.000	.084
SCAFin6	1.9	10.5	47.6	33.3	6.7	3.32	4.016	.000	.081
SCAEff1		5.7	39.0	50.5	4.8	3.54	8.183	.000	.066
SCAEff2	1.0	8.6	29.5	53.3	7.6	3.58	7.498	.000	.077
SCAEff3		17.1	39.0	37.1	6.7	3.33	4.068	.000	.082
SCAEff4		13.3	40.0	39.0	7.6	3.41	5.137	.000	.080
SCAEff5	2.9	7.6	55.2	26.7	7.6	3.29	3.533	.001	.081

Note: 1 to 5 scale use where 5= very good or strongly agree or greatly exceed

In terms of the five sets of questions on IT capabilities, namely, IT Business Process capabilities (ITBP1 to ITBP5), IT External Link capabilities (ITExt1 to ITExt3), Businesses IT Strategy capabilities (ITStr1 to ITStr6), IT Management Processes (ITMgt1 to ITMgt4), and IT Infrastructure assets (ITInf1 to ITInf6), most respondents (about 70% to 75%) rated themselves as average to good relative to others in their industry.

In terms of the three sets of questions on Customer Knowledge Capabilities, namely, Market Responsiveness to Customers (MResCus1 to MResCus3), Customer Nurturing Processes (CusNur1 to CusNur5), and High-value Customer Processes (CusVal1 to

CusVal5), most (about two-thirds to three-quarters) respondents rated themselves as average to good relative to others in their industry.

In terms of the two sets of questions on Customer Relating Capabilities (CRC), namely, Market Responsiveness to Competitors Processes (MResCmp1 to MResCmp2), and Customer Information and Unique Product/Services Processes (UPS1 to UPS5) most (about two-thirds to three-quarters) rated themselves as average to good relative to others in their industry.

In terms of the six Information Privacy Protection Capabilities (IPP1 to IPP6), most (about 80% to 90%) respondents rated themselves as either meeting or exceeding guidelines when asked to compare their customer information handling practices to the "Best Practice Guidelines for Direct Marketing Data" available on the New Zealand Marketing Association's Web site. No respondents rated themselves as well below guidelines on their data collection practices (IPP1) and practices for informing customers of new internal or external uses of their data (IPP3 and IPP4).

In terms of the six questions on a Strategic Competitive Advantage in efficiency measured as financial performance (SCAFin1 to SCAFin6), most respondents rated their performance over the past 2 years as equal or better to that of their most competitive opponent/direct competitor. No respondents rated themselves as much worse in terms of return on assets (SCAFin1) and net operating margin (SCAFin5).

In terms of the five questions on Strategic Competitive Advantage as effectiveness of CRM (SCAEff1 to SCAEff5), most respondents (about 65% to 90%) rated their performance over the past 2 years as equal or better when compared to their most competitive opponent/direct competitor. No respondents rated themselves as much worse on three of the five measures of efficiency.

Reliability and Convergent Validity

Reliability and convergent validity results are shown in Table 4.5. Question items with standardised loadings less than 0.50 (Tenenhaus et al., 2005) and/or communalities less than 0.30 (Falk, 1987; Fornell & Cha, 1994) were removed (Churchill, 1979 cited in Straub, Boudreau & Gefen, 2004). The average communality of a block of items indicates how well they measure the unobserved construct they reflect (i.e. convergent validity). Item communality is the average proportion of variance of an item explained by the latent construct it measures (Sellin & Keeves, 1997). Table 4.5 shows questions remaining in the model after this step along with measures of internal reliability (i.e. Cronbach's alpha and Composite Reliability), and convergent validity (i.e. item communality exceeding 0.30; significant and strong (greater than or equal to 0.70) standardised item to factor loadings).

All remaining items loaded significantly ($p \leq 0.05$; $t \geq 1.96$) on the appropriate construct with the standardised loadings ranging from 0.59 to 0.81 and item communalities ranging from 0.32 to 0.66 implying the items shown in Table 4.5 have adequate convergent validity. All composite reliabilities (CR) exceeded 0.70 (Straub, Boudreau & Gefen 2004; Thompson et al., 1995) and Cronbach's alphas ranged from 0.58 to 0.82 approximating the recommended cut-off of 0.60 or higher (Nunnally & Bernstein, 1994; Straub, Boudreau & Gefen 2004) indicating the measurement model has acceptable internal consistency. Reliability values in the mid-ranges are less suspect than those exceeding 0.95 which may imply respondents remember prior responses rather than answering naturally (Meehl, 1967 cited in Straub, Boudreau & Gefen, 2004). In addition, Composite Reliability (CR) is a more flexible measure of reliability in the sense that it does not require the items to be equally weighted (Fornell & Larcker, 1981).

Table 4.5 Measurement model results.

Reliability			*Convergent Validity*				
Latent Construct	**Cron.'s Alpha (0.6-0.8)**	**CR ≥ 0.7**	**Question Item**	**Comm-unality ≥ 0.3**	**Std. Loading**	**Std. error**	**t-value**
IT_In	0.58	0.78	ITStr1	0.55	0.74	0.08	8.91
			ITInf2	0.60	0.75	0.09	8.49
			ITInf3	0.47	0.68	0.10	6.66
IT_Out	0.58	0.78	ITExt1	0.66	0.81	0.04	20.70
			ITExt2	0.43	0.65	0.10	6.66
			ITExt3	0.56	0.74	0.07	10.13
IT_Span	0.58	0.78	ITBP1	0.54	0.73	0.13	5.59
			ITBP4	0.53	0.69	0.11	6.38
			ITBP5	0.56	0.72	0.13	5.76
CKC	0.69	0.81	CusVal3	0.59	0.76	0.09	8.82
			CusVal5	0.50	0.68	0.10	6.80
			UPS2	0.39	0.59	0.14	4.34
			UPS3	0.60	0.77	0.08	9.86
CRC	0.82	0.87	MResCus1	0.48	0.67	0.07	9.61
			MResCus2	0.47	0.68	0.07	9.54
			MResCus3	0.47	0.68	0.06	11.34
			CusNur1	0.56	0.73	0.06	11.59
			CusNur2	0.34	0.56	0.12	4.95
			CusNur3	0.32	0.54	0.12	4.76
			CusNur4	0.43	0.64	0.08	8.49
			CusNur5	0.49	0.69	0.09	8.08
IPP	0.78	0.84	IPP1	0.45	0.65	0.08	8.57
			IPP2	0.54	0.73	0.05	14.81
			IPP3	0.44	0.65	0.07	8.82
			IPP4	0.54	0.73	0.06	12.86
			IPP5	0.44	0.66	0.06	10.22
			IPP6	0.42	0.65	0.08	8.47
Effectiveness	0.70	0.81	SCAEff1	0.39	0.62	0.08	7.75
			SCAEff2	0.58	0.75	0.05	14.65
			SCAEff3	0.39	0.61	0.08	7.88
			SCAEff4	0.45	0.65	0.07	9.09
			SCAEff5	0.49	0.69	0.07	10.62
Efficiency	0.65	0.79	SCAFin1	0.60	0.75	0.10	7.96
			SCAFin2	0.56	0.72	0.13	5.70
			SCAFin3	0.41	0.60	0.16	4.08
			SCAFin5	0.39	0.64	0.12	4.99

Discriminant validity was assessed using the two tests discussed in Chapter 3. The first test for discriminant validity requires the square root of the average variance extracted (SQRT (AVE)) for each construct to exceed the construct's correlation with any other construct. No firm guidelines exist to indicate how much larger it should be but a guideline of at least 0.10 or higher has been suggested (Tenenhaus et al., 2005).

Table 4.6 Results of the first test for discriminant validity.

AVE		ITSpan	IPP	CKC	CRC	Efficiency	Effectiveness	IT_Out	IT_In
0.54	**ITSpan**	**0.74**							
0.47	**IPP**	.190(*)	**0.69**						
0.52	**CKC**	.317(**)	.232(**)	**0.72**					
0.45	**CRC**	.323(**)	.495(**)	.435(**)	**0.67**				
0.49	**Efficiency**	.289(**)	.217(*)	.306(**)	.198(*)	**0.70**			
0.46	**Effectiveness**	.209(*)	.473(**)	.335(**)	.554(**)	.382(**)	**0.68**		
0.55	**IT_Out**	.419(**)	.144	.313(**)	.053	.208(*)	.095	**0.74**	
0.54	**IT_In**	.306(**)	.177(*)	.105	-.063	.176(*)	.030	.44(**)	**0.73**

Note: * $p \leq 0.05$; ** $p \leq 0.01$

Table 4.6 gives the AVE values generated using the PLS-Graph 3.0 bootstrap procedure (with 200 re-samples) described in Chapter 3 and the correlations between all latent constructs. The SQRT (AVE) is shown on the diagonal. The SQRT (AVE) exceeds all other correlations by at least 0.10 (an order of magnitude) in all cases. These results imply satisfactory discriminant validity for the remaining items. However, it should be noted, a number of the original items had to be dropped from the measurement model. The original set of IT capability measures could be improved upon in future studies. Table 4.7 shows the AVE and CR values before and after items were dropped from the original measurement model. In addition, the final model has no second order factors. The copy of the survey instrument in the Appendix indicates which questions were dropped from the model prior to assessing the structural model (i.e. hypothesis testing).

Table 4.7 Items were removed to improve the Measurement Model.

Initial Model					Final Model			
Second Order Factors	**First Order Factors**	**Number of Items**	**CR >0.70**	**AVE > 0.5**	**First Order Factors**	**Number of Items**	**CR > 0.70**	**AVE > 0.5**
IT Spanning Capability (ITSpan)	**ITBP**	5	0.76	0.37	ITSpan	3	0.78	0.54
	ITMgmt	4	0.62	0.33				
	ITExt	3	0.78	0.55	ITExt	3	0.78	0.55
IT Internal Capability (IT_In)	**ITStr**	6	0.74	0.33	IT_In	3	0.78	0.54
	ITInf	6	0.70	0.29				
CKCapability (CKC)	**CusVal**	5	0.79	0.43	CKC	4	0.81	0.52
	MResCmp	2	0.77	0.63				
	UPS	5	0.79	0.45				
CRCapablity (CRC)	**MResCus**	3	0.81	0.59	CRC	8	0.87	0.45
	CusNur	5	0.83	0.49				
	Efficiency	6	0.76	0.35	Efficiency	4	0.79	0.49
	Effectiveness	5	0.81	0.46	Effectiveness	5	0.81	0.46
	IPPCap	6	0.84	0.47	IPPCap	6	0.84	0.47

Table 4.7 indicates a number of the first order constructs in the original model had unacceptable AVE values (less than 0.50) indicating the items probably cross-loaded on first order factors other than the one they were meant to measure (shown later in Table 4.7). Table 4.5 indicated which items remained in the final measurement model. All four IT Management (ITMgmt) items and two of the five IT Business Process (ITBP) questions were dropped leaving only three items to measure IT Spanning capability (ITSpan). ITSpan therefore became a first order factor with ITBP and ITMgmt being dropped from the model. Similarly, IT Inside-out (IT_In) became a first order factor measured by one of the original IT Strategy (ITStr) and two of the original IT Infrastructure (ITInf) items. In addition, Customer Knowledge Capability (CKC) became a first order factor measured by two of the original Customer Value (CusVal) items and two of the original Unique Products/Services (UPS) items. Both items on Market Responsiveness to Competitors (MResCmp) were dropped.

The second test for construct validity (Gefen & Straub, 2005) is for each item to

correlate more highly with the construct it was meant to measure than with any other construct by at least an order of magnitude (i.e. 0.10 or greater difference).

Table 4.8 Results of the second test for discriminant validity.

	ITSpan	IT_Out	IT_In	CKC	CRC	IPP	Efficien	Effectiv
ITBP1	.732(**)	.398(**)						
ITBP4	.728(**)							
ITBP5	.747(**)							
ITExt1		.811(**)						
ITExt2		.655(**)						
ITExt3		.745(**)						
ITStr1			.744(**)					
ITInf2			.774(**)					
ITInf3			.683(**)					
CusVal3				.766(**)	.394(**)			
CusVal5				.707(**)				
UPS2				.621(**)	.			
UPS3				.772(**)				
MResCus1					.690(**)			
MResCus2					.687(**)			.396(**)
MResCus3					.687(**)	.426(**)		.463(**)
CusNur1				.387(**)	.750(**)	.		.400(**)
CusNur2					.584(**)			
CusNur3					.568(**)			
CusNur4					.659(**)			
CusNur5				.382(**)	.697(**)			.384(**)
IPP1						.672(**)		
IPP2					.459(**)	.737(**)		.391(**)
IPP3						.660(**)		
IPP4						.736(**)		
IPP5						.661(**)		
IPP6						.646(**)		
SCAFin1							.777(**)	
SCAFin2							.749(**)	
SCAFin3							.642(**)	
SCAFin5							.623(**)	
SCAEff1					.395(**)			.624(**)
SCAEff2					.465(**)			.759(**)
SCAEff3					.382(**)			.620(**)
SCAEff4								.667(**)
SCAEff5								.700(**)

Note: ** $p \leq 0.01$; * $p \leq 0.05$

Table 4.8 shows all significant correlations between each item and each construct in the model. Insignificant correlations were removed from the table to make it easier to read. A number of items cross-loaded on other factors but still had higher loadings on the intended construct implying adequate discriminant validity. However, the number of significant cross-loadings once again implies a need for better measures in a number of cases. None of the cross-loadings should exceed 0.40 (Hair et al., 1998 cited in Straub, Boudreau & Gefen, 2004). Ten of the thirty-six questions in Table 4.8 show cross-loadings near 0.40.

In terms of the IT capability measures only ITBP1 which was meant to measure IT Spanning has a high cross-loading (0.398) on another factor, IT outside-in resources. All of the other IT capability questions had high loadings close to 0.70 on the construct they were meant to measure implying good discriminant validity for these items. In terms of the CKC questions, one of the five items, CustVal3 had a significant cross-loading on CRC. Two measures of CRC, CusNur1 and CusNur5 had significant cross-loadings on both CKC and Effectiveness. Similarly, MCusRes2 and MCusRes3 had cross-loadings on both IPP and Effectiveness in the first case and just Effectiveness in the second case. In terms of the construct IPP, Information Privacy Protection, IPP2 had significant cross-loadings with CRC and Effectiveness. The measures of efficiency had no significant cross-loadings but three of the measures of effectiveness cross-loaded on CRC. Discriminant validity is shown when each measurement item correlates weakly with all other constructs but strongly with the one that it is theoretically associated (Gefen & Straub, 2005). The items with moderate cross-loadings discussed here represent questions which may not have been interpreted in the same way by all participants. This suggests room for improvement in terms of these particular measurement items (i.e. questions).

Structural (inner) Model

Figure 4.3 shows all significant path loadings in the structural model using the revised

measurement model discussed in the prior sections. Inner path loadings (latent variable to latent variable) should be significant ($p \leq 0.05$) and have a magnitude of 0.20 or higher (Chin, 1998b) to be considered meaningful. T-values are shown in parentheses in Figure 4.3, below each path coefficient. The values below each circle are the multiple R^2 values of the mediating and dependent constructs in the theoretical model. Higher values for R^2 are preferred. The multiple R^2 represents the average proportion of variance of a construct explained by the other constructs which predict that construct (Tenenhaus et al., 2005).

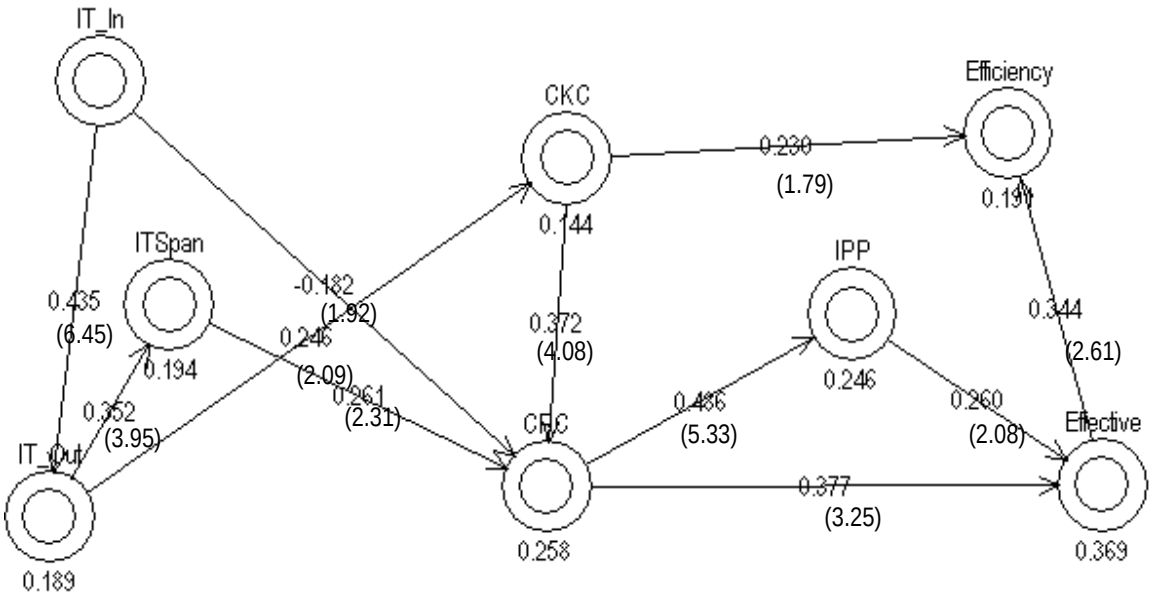

Figure 4.3. Significant paths in the Structural Model ($p \leq 0.05$; $t \geq 1.65$).

There is no official cut-off point for the R^2 value or the overall goodness of fit but higher values are better (Gefen, Straub & Boudreau, 2000). An overall Goodness of Fit (Gof) measure for the structural model can be calculated as follows:

*Goodness of Fit (Gof) = SQRT (Average Communality * Average Multiple* R^2 *)*

Using the results shown in Table 4.9, and this formula, the overall GoF = 0.31. This is similar to an R^2 value for a regression model and is not comparable to the goodness of fit indexes used in covariance based structural models (e.g. LISREL analysis). The redundancy of a construct is the average variance of the block of

measurement items that is explained (i.e. reproduced) by other constructs which predict the construct (Fornell & Cha, 1994). Moderately high values for residual variance once again imply the measurement items should be improved. In addition, none of the redundancy values exceed the recommended cut-off of 0.40 (Tenenhaus et al., 2005) implying other constructs should be investigated in future work to improve the explanatory power of the structural model. All communality values exceeded the minimum acceptable level of 0.30.

Table 4.9 Other results for the Structural Model.

Block	Multiple R^2	Avg Residual Variance	Avg Communality	Avg Redundancy
IT Span	0.19	0.46	0.54	0.11
IPP	0.25	0.53	0.47	0.12
CKC	0.14	0.48	0.52	0.07
CRC	0.26	0.55	0.45	0.12
Efficiency	0.19	0.51	0.49	0.09
Effectiveness	0.37	0.54	0.46	0.17
IT_Out	0.19	0.45	0.55	0.10
IT_In		0.46	0.54	
Average	**0.20**	**0.51**	**0.49**	**0.10**

The results in Figure 4.3 show partial support for hypothesis H1, the ability of IT spanning resources to mediate the relation between the other two types of IT capabilities and the two components of CRM capability (i.e. CRC and CKC). IT spanning capability fully mediated (i.e. no direct effect) the relationship from IT outside-in capability to customer relating capability but did not mediate the relationship between IT outside-in capability and customer knowledge capability. Instead, IT outside-in capability had a moderate (0.246) direct positive effect on CKC. In addition, IT spanning capability did not mediate the relationship from IT inside-out capability to either CRC or CKC, but did have a small (-0.182), direct negative effect on CRC. Finally, IT inside-out capabilities had a strong (0.486), direct positive influence on IT outside-in capability that was not hypothesised.

The results in Figure 4.3 show support for hypothesis H2, the ability of the two components of CRM capability (i.e. CKC and CRC respectively) to fully mediate the relationship between IT spanning resources and the two types of performance measures (i.e. Efficiency and Effectiveness respectively). However, CKC mediated the relationship from IT outside-in capability to Efficiency rather than from IT spanning capability to Efficiency as hypothesised. In addition, CRC fully mediated the relationship from IT spanning capability to Effectiveness as hypothesised.

The results in Figure 4.3 show full support for hypotheses H3a and H3b. IPP only partially mediated the relationship between CRC and Effectiveness, as hypothesised in H3a, since there was also a direct positive (0.377) influence. IPP did not mediate the direct positive impact (0.230) of CKC on Efficiency, supporting H3b.

Finally, the results in Figure 4.3 show full support for hypothesis H4; CRC and IPP fully mediated the relationship from CKC to Effectiveness. Finally, H5 was fully supported; Effectiveness had a direct positive impact (0.344) on Efficiency.

Chapter Summary

This chapter presented the results from the analysis of the sample data; mainly using partial least squares analysis. The measurement model was shown to be adequate in terms of internal consistency (reliability) as well as in terms of convergent validity but on the border in terms of discriminant validity. Since the measurement model was satisfactory (after removal of items with low loadings), the structural model was examined to assess support for each of the hypotheses. The next chapter will interpret these results in light of prior findings in the literature and will make recommendations for changes to practice in the context of IT-supported customer relating and customer knowledge capabilities as well as information privacy protection capabilities.

Chapter 5: Discussion

This chapter compares the results of this study with prior findings discussed in Chapter 2. More specifically, the results have been related to the objectives set out in the introduction, to prior empirical and theoretical work on RBV theory and to Greenaway and Chan's (2005) propositions about treating privacy protection capability as a resource. The discussion is organised based on how organisational capabilities were found to influence firm performance. It begins with a comparison of this study's findings on how (directly or indirectly) different types of IS resources (Spanning, Outside-in and Inside-out capabilities) influence customer relating and customer knowledge capabilities (CRC/CKC) to the controversial findings in prior empirical work on IS and RBV theory. Secondly, the study's findings on how CKC directly influences efficiency but indirectly influences CRC capabilities and effectiveness are compared with prior findings in the literature. Thirdly, the study's findings on the role of information privacy protection capabilities in partially mediating the direct influence of CRC on effectiveness is compared with expected findings based on Greenaway & Chan's (2005) proposal for using RBV theory to explain how privacy protection can be treated as a capability which can lead to a strategic competitive advantage.

Influence of IS capabilities on CRC/CKC

This study's results only partly support Wade & Hulland's (2004) propositions concerning IS spanning resources, IS outside-in resources and IS inside-out resources in terms of their impact on initial strategic competitive advantage (measured as performance). Two propositions from Wade & Hulland (2004) were examined where only one of the three options (4a, 4b and 4c) for the second proposition (called Proposition 4) was expected to hold. The three options for Proposition 4 represent no mediation, partial mediation and full mediation respectively. A finding of either full or

partial mediation implies the existence of an intervening mechanism between an antecedent variable and a consequent variable (Venkatraman, 1989). Mediation implies the existence of indirect effects between an antecedent and a consequent variable, not varying effects on the consequent variable due to interactions (i.e. contingencies) between an antecedent and another variable (i.e. a moderator). The following two propositions, stated by Wade and Hulland (2004), are relevant to this study:

> "Proposition 2: Outside-in and spanning resources will have a stronger impact than inside-out IS resources on initial competitive position" (p. 122).

> "Proposition 4a: IS resources directly influence competitive position and performance.
> Proposition 4b: IS resources influence competitive position and performance both directly and indirectly through interactions with other constructs (including other resources).
> Proposition 4c: IS resources influence competitive position and performance only indirectly through interactions with other constructs (including other resources)" (p. 124).

As shown in Table 5.1, Proposition 2 was supported. The total effect sizes of IS Spanning and IS Outside-in capabilities on Effectiveness and Efficiency are greater than those of IS Inside-out capabilities. No significant direct effects between any of the three types of IS capabilities and the two performance constructs, Effectiveness and Efficiency, were found. The total effect of one construct on another is the sum of the direct effect, if any, and all indirect effects, if any. Indirect effects are the sum of the products of the standardised path loadings on each path with more than two constructs. A point of difference is that this study asked participants to rate their performance over the past 2 years, which is not quite the same as "initial competitive position" as stated in Wade and Hulland's Proposition 2.

Table 5.1 Total direct and indirect effects of IS capabilities on firm performance.

From	To	Direct Effect	Indirect Effects	Total Effect
IT-Inside	**IT-outside**	0.435		0.435
	IT-Span		0.153	0.153
	CRC	-0.182	0.040	-0.142
	IPP		-0.050	-0.050
	Effectiveness		0.056	0.056
	Efficiency		0.007	0.007
IT-Outside	**IT-Spanning**	0.352		0.352
	CRC		0.092	0.092
	CKC	0.246		0.246
	IPP		0.089	0.089
	Effectiveness		0.338	0.338
	Efficiency		0.088	0.088
IT Spanning	**CRC**	0.261		0.261
	IPP		0.127	0.127
	Effectiveness		0.131	0.131
	Efficiency		0.045	0.045
CKC	**CRC**	0.372		0.372
	IPP		0.181	0.181
	Effectiveness		0.187	0.187
	Efficiency	0.230	0.064	0.294
CRC	**IPP**	0.486		0.486
	Effectiveness	0.377	0.126	0.503
	Efficiency		0.173	0.173
IPP	**Effectiveness**	0.260		0.260
	Efficiency		0.089	0.089
Effectiveness	**Efficiency**	0.344		0.344

Table 5.1 also shows that this study found support for Proposition 4c from Wade and Hulland (2004), since only indirect effects were found between IS capabilities and the two performance constructs. This implies the relationship between IS resources and performance is fully mediated by other constructs such as customer relating and customer knowledge capabilities. This is important since it implies IS capabilities have no impact on CRM performance unless the intervening customer knowledge and customer relating capabilities are present. This result further supports the group of prior studies who also found only indirect effects (i.e. full mediation). Studies which found no

effect may have done so because they did not include these intervening constructs. Studies which found direct effects or a mixture of direct and indirect effects may not have clearly separated IS capabilities from customer relating and customer knowledge capabilities.

For managers engaged in CRM, who have or are considering investing in IS capabilities, these results provide several suggestions for changes in practice. Specifically, this study found IS spanning capability fully mediates the relationship between IS outside-in capability and customer relating capability but does not mediate the direct negative influence of IS inside-out resources on customer relating capability. This absence of direct effects implies firms need to improve spanning resources such as IS-business partnerships and IS planning and change management in order to realise a benefit from investment in externally focused IT supported capabilities such as capacity for frequently updating information presented to customers, fast delivery, IT supported online B2B communities and IT mediated external linkages. Secondly, investment in internally focused resources such as IS infrastructure and IS strategy capabilities alone had a small but negative, suppressing effect on building long-term relationships with customers but a positive impact on externally focused IS capabilities. This result suggests firms who seek to build long-term relationships with customers and to position themselves as customer-oriented will not benefit from an investment in internally focused IT resources (e.g. technical skill development and cost effective operations) unless they also invest in both complementary externally focused IS resources and IS spanning resources.

Interestingly, firms who have a market orientation and focus on gathering customer information to improve internal processes as opposed to building long-term relationships may also find that an investment in externally focused IS resources can enhance customer knowledge capabilities (i.e. direct positive relationship found). One reason for this finding could be that a focus on using IS to build trust leads to customers being more willing to give accurate information which in turn enhances an organisation’s customer knowledge capability. The results of this study suggest

internally focused IS strategy and infrastructure capabilities can enhance the ability to use IS to support external relationship management and that externally focused IS capabilities can enhance an organisation's ability to manage internal relationships between the IS function and other business units, improving IS planning and enhancing internal change management processes. The use of multi-disciplinary teams to blend business and technology expertise and the use of experience in building external relationships with customers and other businesses appears to contribute to building stronger internal relationships between IS and other business units improving the relationships between line management and IS service providers and line management sponsorship of IS initiatives.

More specifically, some ways to achieve the aforementioned benefits from using IT for external relationship management could include improving technology based links with customers and suppliers and improving the ability to use 2-way collaborations with external partners. Using IS capabilities to collect information from external sources to the firm, disseminating a firm's market intelligence across departments and improving the organisation's response to learning, are other means for building IS outside-in capability (Wade & Hulland, 2004).

Thirdly, investing in internally focused, IS inside-out capabilities such as IS infrastructure had a small, but significant, negative direct effect on customer relating capability. Managers who seek to build customer relating capability using IS resources should pay attention to this negative side effect. Investment in IS infrastructure may be detrimental to building a customer relating capability if IS outside-in and spanning capabilities are not developed sufficiently. This may be one reason there are controversial results in the literature on the effectiveness of IT-supported CRM practices. Investment in infrastructure alone did not directly influence the development of IS-business partnerships, IS planning or change management; capability in the use of IT for external relationship management fully mediated this relationship.

In sum, an investment in IT outside-in resources (e.g. external relationship management,), indirectly helps a firm to achieve its effectiveness and efficiency goals but plays a more direct role in terms of enhancing effectiveness. This study of New Zealand firms engaged in IT supported CRM shows investments in IS infrastructure capabilities do not directly enhance IS spanning capabilities. Contrary to Wade and Hulland's (2004) proposition on the mediating effect of IS spanning resources, this study found using IS to support the management of external relationships appears to impart a learning effect that enhances the ability to improve spanning resources (i.e. management of internal relations between IS and other business units).

Influence of CKC, CRC and IPP on Organisational Performance

Greenaway and Chan (2005) hypothesized that some firms will emphasize using customer information as a means to support efficiency-focused, internally-oriented learning. They will collect customer information with the goal of achieving greater efficiency in internal operations by using it to reduce the cost of new product development or to reduce the time required to complete activities. In contrast, gathering and processing customer information as a means to learn about better ways to address immediate or anticipate future customer preferences is effectiveness-focused as it is externally focused and seeks to improve understanding of particular segment needs. The above two kinds of firms have different performance goals, and may therefore have different privacy protection practices. The following two propositions from Greenaway and Chan (2005) illustrate these different views:

> "Proposition 2: The behaviours of firms that seek competitive advantage through the use of their customer information resource can be explained using the Resource-Based View such that:
>
> Proposition 2a: Firms that emphasize customer information as an efficiency-based internally focused learning resource will subordinate privacy concerns and

emphasize information collection and reuse behaviours;

Proposition 2b: Firms that emphasize customer information as effectiveness based, externally-focused learning resource will accord customer privacy concerns priority over their information gathering opportunities" (p. 186).

First, in order to achieve a competitive advantage in CRM, improvement in both customer knowledge capability and customer relating capability may be desirable. These two aspects of CRM are interrelated and appear to have differential impacts on the two aspects of performance. The prior empirical work reviewed for this study did not simultaneously disaggregate CRC from CKC, or effectiveness from efficiency and did not distinguish three types of IS capabilities. In contrast, this study divided CRM capabilities into CKC and CRC under the assumption that different organisational goals in terms of performance would correlate with different levels of focus on using customer information for internal versus external purposes. The results supported this assumption. CKC had both a direct and indirect positive correlation with efficiency but only a smaller, indirect correlation with effectiveness. In contrast, CRC had both a direct and an indirect positive association with effectiveness but only a small, indirect association with efficiency. In addition, the research model explained 37% of the variance in effectiveness and 19% of the variance in efficiency.

These results have several implications for CRM practice related to considering these differential effects on performance and how performance is measured. In terms of improving financial performance in organisations engaged in IT supported CRM, managers need to pay attention to both customer relating capability such as customer satisfaction, ability to retain customers, ability to improve firm's reputation and customer knowledge capability. CKC includes the ability to identify high-value customers and to adapt a firm's response to competitive moves in the marketplace. Activities for improving the ability to identify and manage high-value customers include continuously refining the customer database to improve the accuracy of customer information and reduce the effort expend on low-value customers. Improving

this knowledge management capability will in turn improve the ability to build relationships with less price-sensitive customers, to use customer information to focus sales resources on high-value customers, to use customer information to help the firm to position products and services, and to personalise services to high value customers. The results support the benefits of the CRM practice of using customer information to tailor products to specific customer needs, a capability that can be difficult for competitors to copy. Information privacy protection capability had a direct positive association with effectiveness, but customer relating capability also had a direct effect on effectiveness.

In this study, customer knowledge capability (CKC) did not mediate the relationship between IS spanning resources and efficiency but fully mediated the relationship between IS outside-in resources and efficiency. The direct positive impact of customer knowledge capability on customer relating capability shows that a better understanding of customers, based on collecting and processing customer information, can lead to a better customer relating capability as proposed in traditional CRM theory. Knowing the customer may help to build trust and may be perceived as the business taking an interest in each customer's needs rather than marketing to everyone in the same way.

Role of Information Privacy Protection Capability

The results of this study supported Propositions 2a and 2b of Greenaway and Chan (2005) stated in the previous section. Proposition 2a was fully supported since information privacy protection capability (IPP) did not mediate the relationship between customer knowledge capability and efficiency. Firms who focused on building a strong customer knowledge management capability put less focus on building IPP capability. Proposition 2b was partly supported since IPP partially mediated the influence of customer relating capability (CRC) on Effectiveness. That is, CRC also had a significant, positive direct effect on Effectiveness. Firms who focused on building a strong customer relating capability also focused on building IPP capability which had a significant,

positive impact on effectiveness. This study's results support and refine the relationships proposed by Greenaway and Chan (2005). In Greenway and Chan's propositions, firms who emphasize using customer information as an externally focused resource will accord customer privacy concerns priority over their own information gathering opportunities. That is, firms that intend to develop a long term relationship with customers will treat their customer information resource as a unique asset, targeted at being useful in achieving organisational goals measured in effectiveness terms. Rather than just complying with industry guidelines, such firms may seek to use IPP as a resource for gaining competitive advantage by exceeding guidelines on privacy protection behaviours.

On the other hand, organisations with a customer knowledge capability focus are likely to consider information privacy protection as less of a concern since internal efficiency can be achieved without it. This implies that organisations who seek competitive advantage by gathering and using customer information to improve internal processes such as new product development may not consider information privacy protection assurances to be a tool for gaining competitive advantage. They appear to focus on compliance with industry guidelines on information handling rather than on exceeding the guidelines as a way to build trust. Internal efficiency takes priority over more externally focused effectiveness measures and privacy concerns are given less weight. This could be a mistake since effectiveness was also shown to have a significant and positive direct impact on efficiency.

This finding supports prior findings that increased customer relating capabilities are associated with increased customer satisfaction and retention, which may in turn lead to greater firm profitability (e.g. Ramaswami, Bhargava, Srivastava, 2004; Salz-Trautman, 2000). That is to say, a comparative advantage in effectiveness may lead to a comparative advantage in efficiency measured as financial performance.

Summary

This chapter speculates on the implications of the study's findings for CRM practice and compares the findings to prior empirical work. Different results were pointed out and possible reasons for the differences were discussed. Implications for CRM practice were discussed in terms of the likely impact on performance outcomes. Most prior work looks at efficiency whereas this study broke performance into both effectiveness and efficiency and found significant differences in terms of how these measures of performance related to firm resources. The next chapter summarises the key contributions of this study, points out the limitations and gives suggestions for future research based on these limitations.

Chapter 6: Conclusions

This final chapter begins with a brief summary of the key findings and a discussion of who the findings are important to and why they are important. This is followed with a discussion of the study's limitations. Lastly, recommendations for future research based on the study's limitations are suggested.

Features and Key findings

This study examined the usefulness of the Resource-based View theory in explaining the roles played by information privacy protection capability, customer relating capability and customer knowledge capability in mediating the IT Resource-Performance relationship. Based on the researcher's literature review, this study appears to be the first empirical study to examine Greenaway and Chan's (2005) proposal to apply RBV theory to organisational level information privacy research. In addition, the prior empirical work, reviewed for this study, did not simultaneously disaggregate CRC from CKC, or effectiveness from efficiency and did not distinguish three types of IS capabilities in an empirical study. This study contributes to the academic literature on CRM by filling these gaps as noted in the following discussion.

This survey study of 105 New Zealand organisations engaged in IT supported CRM produced a number of interesting findings resulting in the contributions summarised below:

- In contrast to the bulk of prior work which finds both direct and indirect effects of IT/IS capabilities on organisational performance, this study found only an indirect effect. Customer relating and customer knowledge capabilities fully mediated different aspects of performance. This may not have been found in prior studies which did not separately measure effectiveness and efficiency or which did not

separately measure CKC and CRC. Investment in IT capabilities must be complemented with investment in business and human capabilities in order to achieve a comparative advantage in effectiveness which leads to a competitive advantage in financial performance.

- Controversial findings in the literature about the ability of CRM to enhance performance might be partly explained by this study's results. Studies which only measure financial performance in terms of efficiency would find no direct impact of CRC on efficiency. Similarly, studies which only measure performance in effectiveness terms (e.g. customer satisfaction or retention) would find no direct impact of CKC on efficiency. Customer knowledge capability can enhance a firm's efficiency whether the firm's privacy protection capabilities exceed or only just meet guidelines. When companies use customer information to predict future markets and provide new services, information privacy protection does not have a direct role. However, when firms want to build up a better relationship with customers by improving customer satisfaction and retention, information privacy protection becomes a vital point to consider.

- Information privacy protection was treated as a resource in this study based on suggestions from Greenaway and Chan (2005) who proposed to use RBV to examine the role of information privacy protection. The study appears to be the first study to have empirically tested their propositions. In doing so, this study developed and tested the measurement of information privacy protection capability in the context of the industry guidelines in the Code of Practice for Direct Marketing in New Zealand. The six measures for the IPP construct dealt with organisational practices, relative to these guidelines, with respect to personal information collection, training of staff to handle queries about information collected, new internal secondary uses, new external secondary uses, access for error correction and unauthorised access. A strong customer relating capability was positively associated with a strong information privacy protection capability which

in turn enhanced effectiveness. A strong customer knowledge capability informs customer relating capability but has no direct effect on information privacy capability confirming the propositions stated in Greenaway & Chan (2005).

Limitations and Future Research

This section discusses both the anticipated limitations of doing survey research and limitations due to unexpected problems which occurred during the study. Since this study was a cross-sectional survey study it is subject to the disadvantages attributed to this approach discussed in the following sections. The timeframe of one-year to complete the Masters degree and limited funding also placed constraints on the type of study and length of time available for data collection and analysis. These limitations as well as the unexplained variance in performance provide guidance for suggestions for future research to extend this study as outlined below.

The ability to generalise the results from the sample to the population it was selected from is dependent on how well the sample represents the target population. The use of a purposeful (non-probability) sampling strategy may have resulted in some sampling frame bias since the sampling frame consisted only of the members of the Association of New Zealand Advertisers (ANZA), members of the New Zealand Marketing Association (NZMA), companies from the list of New Zealand's Top 200 Companies (New Zealand Management, 2006), and companies in the Factiva database. Companies in New Zealand who are engaged in IT-supported CRM but who were not in this frame are not represented. Future work could address this issue by using a different sample which includes these under-represented companies. In addition, a larger sample might be able to detect weaker effects but would have no advantage in being better at detecting the moderate to strong effects detected in this study.

An unanticipated limitation was a lower than desired number of usable responses. Only

105 complete and usable responses were obtained after eight weeks despite making personal phone calls to follow-up. However, due to the time limitations of a one-year Masters degree, and limited funding, it was not possible to collect more data during the time allowed. The response rate from the members of ANZA was only 2.9%, while the response rate from telephone contacts and interviews with organisations was 30%. At the beginning of the survey, only 2 survey forms were returned after 2 weeks despite the survey being sent out by the head of ANZA. Therefore, the researcher changed the way of administering the survey. Instead of just posting it through the mail and making it available online, the researcher started phoning the targeted firms, and administering the survey via interview. The researcher also contacted friends who worked in firms engaged in IT-supported CRM, and sought potential respondents through referrals from these contacts. The response rate improved to 30% (i.e. number completed/ number contacted) after changing the method of data collection.

Future research could improve the measures of organisational performance used in the survey. For example, efficiency of performance could also be measured in terms of return on investment (ROI), a ratio measure that includes both return and investment to achieve the return. Another issue to consider is the use of formative constructs rather than reflective constructs. A number of the measures adopted for this study came from prior studies which treated the measures as reflective but this study found a number of problems with some of the measures when examining the measurement (outer) model. This may imply that aspects of the constructs are not explained by the measures used or that some questions were interpreted differently by different participants. A reflective latent variable has a common latent factor structure with reflective indicators. Changes in the underlying latent construct are reflected by changes in its indicators (Chin, 1998a). On the other hand, with formative (composite) constructs, the indicators that influence the construct are often called ‘causal’ indicators, and the construct is often referred to as a combination variable (Maccallum et al. 1993). This means that the measures cause the construct and the construct is fully derived by its set of measurements so measures can not be dropped without loosing an aspect of the construct. Future research should

consider developing measures for formative constructs. It should be noted that measures of reliability (i.e. internal consistency) and validity for formative constructs differ from those used for reflective constructs and are not as widely agreed upon in the literature (Diamantopoulos & Winklhofer, 2001).

Different countries have different regulations and laws regarding privacy protection. Future research is needed to see whether or not the relationships between IT capabilities, privacy protection capability, CKC/CRC capability and organisational performance differ across contexts. Therefore future research on information privacy protection could replicate this study in another country. The information privacy protection capability measures are based on New Zealand guidelines which are based on Fair Information Practices (FIPs). These FIPS are the basis for most country's privacy laws but the wording of the questions would need to be modified to reflect each country's guidelines or to be more general, with no mention of the name of the sponsor of the guidelines.

Another reason for conducting a similar study in another country would be to assess the role of cultural factors and privacy regulation laws which differ markedly from those of New Zealand. These factors might change the relationships between IPP capability and firm performance. For example, a developed European Union country such as Germany and a developing Asian country such as China are likely to have different social norms on privacy and therefore different privacy legislation relative to New Zealand. It would be interesting to investigate how IS resources, CKC resources, CRC resources, IPP capability and firm performance interact in different environments and to understand the factors that explain these differences. Qualitative research in the form of case studies may be a useful way of understanding the processes by which capabilities are developed under different contextual conditions which help to explain why differences might exist. Such an understanding might guide international companies in considering how much to adapt (versus standardise) their customer relating and privacy protection strategies to gain or maintain a comparative advantage.

Future research should also look more closely at using Comparative Advantage Theory by incorporating measures of rarity and translation. Rarity is used to examine to what extent each competency or skill is unique to a firm. The higher the rarity of a resource, the more possibility a firm can achieve a long-term competitive advantage. Translation is used to examine to what extent a firm is able to translate each unique competency or skill into offering products or services that provide superior value to customers. Both rarity and translation are useful in measuring the value of a comparative advantage in resources.

Future research could use a larger sample to improve the power to detect small, but significant effects and may want to look at differences between small to medium sized and large firms. For a small firm, which possesses fewer resources than a big firm, it may be more critical to correctly identify resources which can lead the firm to compete better in the marketplace. In addition, small and large firms may differ in terms of the types of capabilities they are better able to develop. Future research which takes this into consideration may benefit the development of CRM strategies in small and medium sized firms that will make the best use of limited resources. For a large firm, knowing which available resources are the most valuable, in terms of being unique and hard to duplicate, may help decision makers focus their CRM strategies on how to maintain a leading position in the market and to turn an initial competitive advantage into a sustained one.

Summary

This study provided several insights into the use of RBV theory as an explanation for IT-supported CRM and the treatment of information privacy protection as a resource which can contribute to competitive advantage via its positive direct influence on effectiveness. Marketing managers, CRM involved firms and information privacy policy makers can benefit from the results of this study. It shows that, information privacy protection does not have a direct role when customer information is used to

predict future markets and provide new services. But it is an important factor to consider for firms with a customer-orientation who seek to build better, long-term relationships with customers. Future research can also benefit from this study's findings in terms of using RBV theory to explain how IS resources and CRM resources interact and impact on performance. Dividing IS resources into inside-out, outside-in and spanning resources, and disaggregating CRM capabilities into CRC and CKC, had differential effects on effectiveness and efficiency that should be further explored in future studies of IS resources, organisational level privacy protections and organisational performance.

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Appendix

Survey form: Organisational Customer Information

Handling Strategies and Practices

Demographics

1) Which **one** of the following best describes your job title? (Choose one.)

☐ Marketing Manager ☐ Marketing Director ☐ Vice-President of Marketing

☐ Other, please explain: _____

2) How many years has your organisation been engaged in IT-supported Customer Relationship Management? (Choose one.)

☐ More than 10 years ☐ 7 to 10 years ☐ 4 to 6 years ☐ 1 to 3 years

☐ No more than 1 year

3) How many employees work for your organisation, at all locations? (Choose one.)

☐ 2,500 or more ☐ 1,000 - 2,499 ☐ 750-999 ☐ 500-749 ☐ 250-499

☐ 100 - 249 ☐ 50 – 99 ☐ 6 – 49 ☐ Fewer than 6 ☐ Not sure

		Strongly Disagree				Strongly Agree
4)	Compared to others in our industry, our organisation tends to be first to market with innovative new products/services.	1	2	3	4	5
5)	Compared to others in our industry, our organisation tends to be first to develop new process technology.	1	2	3	4	5
6)	Compared to others in our industry, our organisation tends to be first to recognize and develop new markets.	1	2	3	4	5
7)	Compared to others in our industry, our organisation tends to be at the leading edge of technological innovation.	1	2	3	4	5

8) What is your main area of business? (Choose one.)

☐ Communications: Public relations, Advertisement, etc.
☐ Computer and Data Processing Services Marketing
☐ Chemical or Pharmaceutical
☐ Educational: College, University, or Other Educational Institution
☐ Financial Services: Banking, Insurance, Securities, and Credit
☐ FMCG (Fast Moving Consumer Goods), Grocery Industry, etc.
☐ Government or Military Organisation
☐ Manufacturing and Processing
☐ Marketing Research
☐ Medical Services
☐ Real Estate
☐ Social or Non-profit Organisation
☐ Trade: Wholesale
☐ Trade: Retail
☐ Tourism: Travel Agent, Ticketing
☐ Transportation Services: Land, Sea and Air
☐ Utilities: Communications, Electric, Gas and Sanitation Services
☐ Other (Please specify.) _____

Type of Relationship with Customers

9) Please select the group below which **best** represents your **organisation's routine relationship** with **most of your customers/clients**. (Choose one.)

☐ We have a long-term relationship with our customers as partners. (Long-term relationship here means your organisation generally works with the same customers as a sort of partnership and tries to have long-term gains from the contact with them.)

☐ We keep a relationship with our customers as friends, but not as partners. (This means your organisation frequently keeps in touch with customers but does not expect to work with the same set of customers all the time; your organisation tries to have medium-term gains from contact with its customers.)

☐ We have a short-term relationship with our customers as we want to complete the exchange with our customers successfully within a short amount of time. (This means your organisation only requires a short-term transactional relationship with its customers.)

Relative to other organisations in your industry, how do you rate each of your organisation's following IT Capabilities? (Circle one response for each question.)

IT Business Partnerships	Exceptionally Good				Poorer than Most
10) Our ability to use multi-disciplinary teams to blend business and technology expertise	1	2	3	4	5
11) *Our relationships between line management and IT service providers	1	2	3	4	5
12) *Our line management sponsorship of IT initiatives	1	2	3	4	5
13) Our ability to foster a climate that encourages risk taking and experimentation with IT	1	2	3	4	5
14) Our ability to foster a climate nurturing IT project championship	1	2	3	4	5

External IT Links	Exceptionally Good				Poorer than Most
15) Our technology based links with customers	1	2	3	4	5
16) Our technology based links with suppliers	1	2	3	4	5
17) Our ability to use entrepreneurial, 2-way collaborations with external partners	1	2	3	4	5

Business IT Strategy	Exceptionally Good				Poorer than Most
18) Our clarity of vision with respect to how IT contributes to business value	1	2	3	4	5
19) *Our ability to integrate IT business strategic planning and IT planning	1	2	3	4	5
20) *Our management's ability to understand the value of IT investments	1	2	3	4	5
21) *Consistency of IT application portfolios with business processes	1	2	3	4	5
22) *Restructuring of business work processes to leverage opportunities	1	2	3	4	5
23) *Restructuring of IT work processes To leverage opportunities:	1	2	3	4	5

IT Management	Exceptionally Good				Poorer than Most
24) *Effectiveness of our IT planning	1	2	3	4	5
25) *Consistent application of IT policies across the organisation	1	2	3	4	5
26) *Our ability to keep information secure	1	2	3	4	5
27) *Our ability to comply with information collection and handling standards & regulations	1	2	3	4	5

IT Infrastructure	Exceptionally Good				Poorer than Most
28) *Quality of the data stored in our IT systems	1	2	3	4	5
29) Flexibility of our data structures in answering ad hoc queries	1	2	3	4	5
30) One integrated view of our customer information within our organisation	1	2	3	4	5
31) *Investment in IT tools for analyzing revenue and cost data to identify current and future high-value customers	1	2	3	4	5
32) *Investment in IT for 2-way communications with our customers:	1	2	3	4	5
33) *Investment in IT to track customer defection and retention levels	1	2	3	4	5

CRM Capabilities

Market Responsiveness (Customers)	Very Poor		Average		Very Good
34) How do you rate your organisation's ability to use customer information to enable quickness of response to meeting changes in customer needs and wants?	1	2	3	4	5
35) How do you rate your organisation's ability to use customer information to respond to customer complaints?	1	2	3	4	5
36) How do you rate your organisation's efforts to make product/service changes to overcome customer dissatisfaction with existing products?	1	2	3	4	5

Customer Nurturing	Strongly Disagree				Strongly Agree
37) Our organisation recognizes customers as assets.	1	2	3	4	5
38) Our organisation is willing to spend dollars to nurture our customers.	1	2	3	4	5
39) Our competitors envy our customer support capabilities.	1	2	3	4	5
40) We have designed information systems to understand and serve our customers better.	1	2	3	4	5
41) We look upon CRM as the most important business process for driving financial performance.	1	2	3	4	5

High-value Customers	Strongly Disagree				Strongly Agree
42) *We continuously refine our customer base by using customer information to eliminate low-value customers.	1	2	3	4	5
43) *We make a conscious attempt to use customer information to minimize catering to price-sensitive customers.	1	2	3	4	5
44) We use customer information to focus our sales resources on high-value customers.	1	2	3	4	5
45) *We use customer information to help us position our products/services at the high-end of the price-quality continuum.	1	2	3	4	5
46) We use customer information to personalise our services to our major customers.	1	2	3	4	5

Market Responsiveness (Competitors)	Very Poor		Average		Very Good
47) *How do you rate your organisation's speed of dissemination of information in-house about competitors?	1	2	3	4	5
48) *How do you rate your organisation's response to competitive moves in the marketplace?	1	2	3	4	5

Customer Information and Unique Products/Services

	Strongly Disagree				Strongly Agree
49) *We primarily use customer information to create personalised products/services that are difficult for our competition to copy.	1	2	3	4	5
50) We effectively share customer information between marketing and other departments.	1	2	3	4	5
51) *We effectively share customer information within our marketing department or group.	1	2	3	4	5
52) *We have formal or informal processes in place to collect information about how our competitors use customer information and use this knowledge to improve our marketing skills.	1	2	3	4	5
53) We have formal or informal processes in place to share customer information with our business partners.	1	2	3	4	5

Information Privacy Protection Capability

Please indicate how your organisation's actual customer information handling practices compare to the "Best Practice Guidelines for Direct Marketing Data" available on the New Zealand Marketing Association's Web site.

54) How do you rate your organisation's overall practice of collecting personal information from customers?

Well Below	Below Guidelines	Meet Guidelines	Above Guidelines	Greatly Exceed
1	2	3	4	5

55) How do you rate your organisation's overall practice of training staff to answer questions from customers about personal information your organisation has collected?

Well Below	Below Guidelines	Meet Guidelines	Above Guidelines	Greatly Exceed
1	2	3	4	5

56) How do you rate your organisation's overall practice of informing customers of new internal uses of their information?

Well Below	Below Guidelines	Meet Guidelines	Above Guidelines	Greatly Exceed
1	2	3	4	5

57) How do you rate your organisation's overall practice of informing customers of new external uses of their information?

Well Below	Below Guidelines	Meet Guidelines	Above Guidelines	Greatly Exceed
1	2	3	4	5

58) How do you rate your organisation's overall practice of giving customers access to correct any errors in personal information (such as via calls, Web sites and email)?

Well Below	Below Guidelines	Meet Guidelines	Above Guidelines	Greatly Exceed
1	2	3	4	5

59) How do you rate your organisation's overall practice of protecting customer information from unauthorized access?

Well Below	Below Guidelines	Meet Guidelines	Above Guidelines	Greatly Exceed
1	2	3	4	5

Relative to your most competitive opponent/direct competitor, how has your business performed over the last two years? (Circle one response for each question.)

Strategic Competitive Advantage (Financial Performance - Efficiency)

	Much Worse	Worse	Equal	Better	Far Better
60) Our return on assets after tax were:	1	2	3	4	5
61) Our profitability was:	1	2	3	4	5
62) Our market share was:	1	2	3	4	5
63) Our sales were:	1	2	3	4	5
64) Our net operating margins were:	1	2	3	4	5
65) Our ability to charge price premiums for products/services were:	1	2	3	4	5

Strategic Competitive Advantage (Effectiveness of CRM)

	Much Worse	Worse	Equal	Better	Far Better
66) Our ability to handle customer complaints was:	1	2	3	4	5
67) Our customer satisfaction levels were:	1	2	3	4	5
68) Our ability to retain customers was:	1	2	3	4	5
69) * Our ability to improve our image/reputation was:	1	2	3	4	5
70) Our ability to increase the number of relationships with customers was:	1	2	3	4	5

Thank you for answering all the questions.

Please enter your email address here if you would like to receive a copy of the results:

Email: _____

Note: Questions that were dropped based on the analysis of measurement model have been marked with an asterisk *.