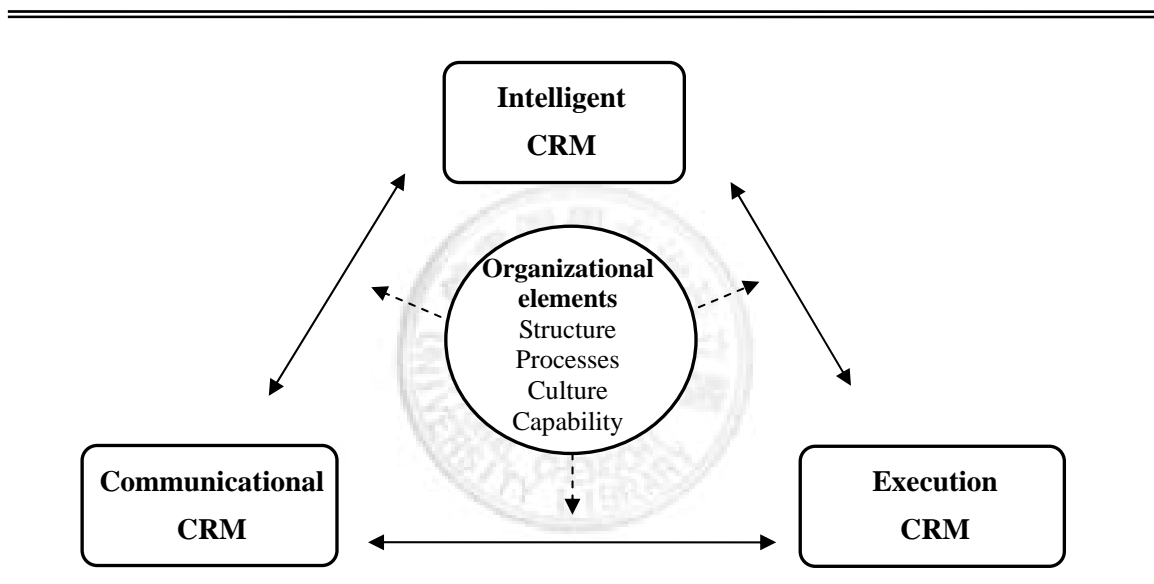## CHAPTER 2: LITERATURE REVIEW

2.1 Studying the CRM System from a Socio-technical View

To build a complete understanding of the management of CRM systems, this study applies a socio-technical view that studies the design, uses, and consequences of information technologies and that takes into account their interaction with institutional and cultural contexts (Kling, 1999). In this view, optimal organizational performance is achieved by jointly optimizing both the social and technical systems used in production (Mumford, 1997, 2000; Williams and Edge, 1996).

Based on the literature of CRM management, the technology and organizational elements of CRM (depicted in Figure 2-1) are closely interrelated in the operation of a business.

Figure 2-1. Major Technology and Organizational Elements of a CRM System
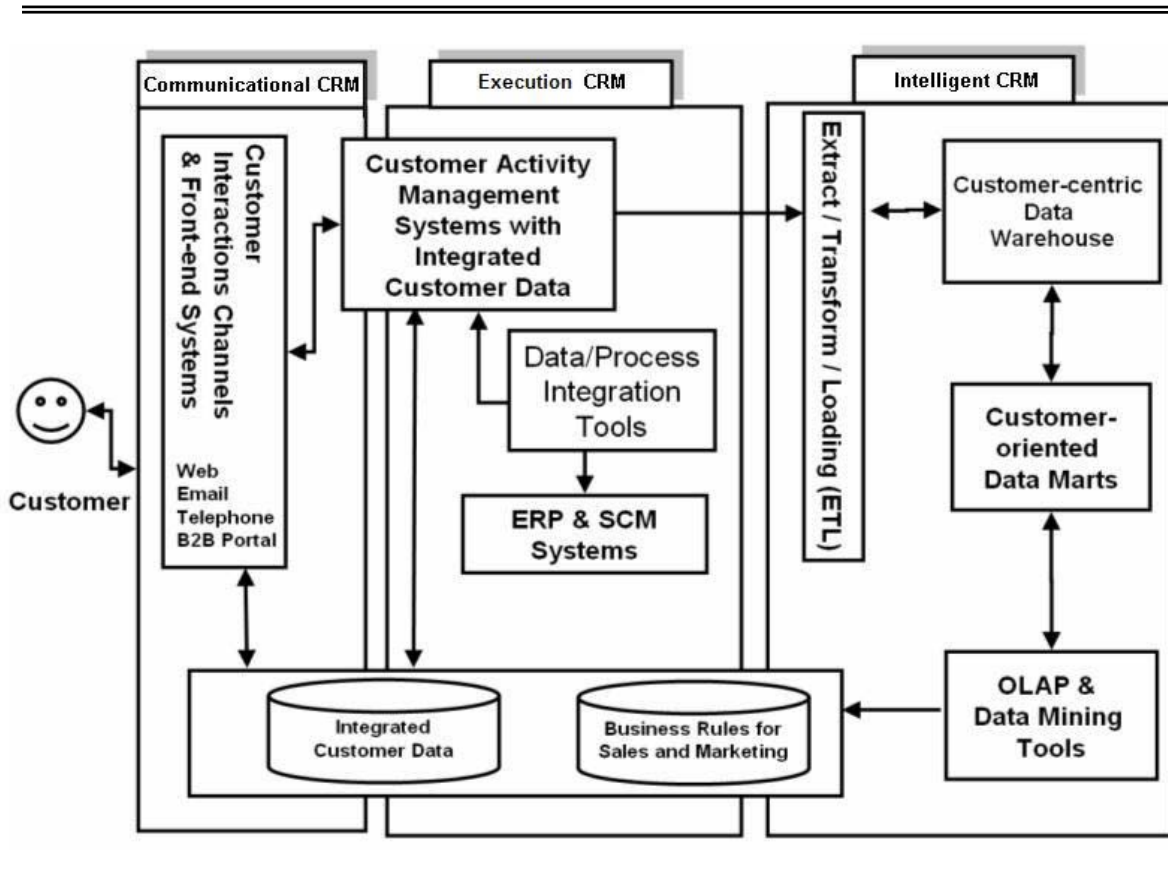

2.2 CRM Technology Elements

Based on the literature and field studies (Chan, 2005; Foss, Devonport, and McDaid, 2002), Chen and Shang (2005) proposed an IT infrastructure of a CRM system (depicted in Figure 2-2) that can help to explain the evolutionary path of CRM implementation from both the IT and organizational perspectives. There are three major components—communicational, execution, and intelligent CRMs—in the architecture explained in the following subsections.

2.2.1 Communicational CRM

Communicational CRM is mainly responsible for managing the interactions with customers through all sales and marketing channels. Most CRM implementation started with simple call center systems handling inbound customer phone calls. Communicational CRM is the front-end

application that supports customer-facing processes. It focuses on the *communication* aspect of customer interactions.

Figure 2-2. Enterprise-wide CRM IT Infrastructure

Client/server applications to support customer service representatives at call centers represented the first generation of communicational CRM. Voice response systems and computer telephone integration (CTI) are additional technologies that may improve the productivity of customer services. The first step in such CRM implementation is a centralized source for all relevant data that are required for interacting with customers through various touch points (Hyperion, 2001).

However, CRM is not just about implementing call center applications. In our empirical studies, the implementation of CRM by all five organizations studied started with call center applications, but the more mature organizations did not stop there. A call center is the hub of customer-facing processes that attracts new customers and serves existing customers (Peel, 2002). The major challenge of call center operations is to maintain high-quality call center personnel. This is directly linked to the training, motivation, and compensation of employees. With the support CRM functions, call center operators can be empowered to become skillful marketing and sales persons.

With the omnipresence of the Web and the growing popularity of conducting business online, customers often contact companies directly through their Web sites for product information, to place and track orders, and to submit service requests. Direct customer contact with Web-based applications presented both major challenges and opportunities for organizations. Companies needed to adjust from using aggregation customer data for mass marketing to using disaggregated data (i.e., information about individual customers) for personalization and customization. Web interactions with customers directly provided the opportunity to capture, analyze, and act on disaggregated information such as click-stream data, shopping cart abandonment, etc., to provide insights into customer's desires and needs (Chen and Liou, 2002; Peel, 2002). Outbound interactions and marketing via phone calls or e-mail are indications of more matured communicational CRM implementation.

2.2.2 Execution CRM

Execution CRM supports typical customer management activities (Starkey, Woodcock, and Stone, 2002). The customer activity management systems are applications that support these customer-facing core business processes. Execution CRM focuses on the *transaction* aspect of customers' activities.

Initial implementation of CRM started with basic account management, inquiry management, and the management of such things as billing problems, order tracking, etc. Building an enterprise-wide CRM system requires that execution CRM to be integrated with other enterprise systems such as enterprise resource planning (ERP) and supply chain management (SCM) systems. The integration often occurs at more mature stages of CRM implementation. The data and process integration tools allow CRM systems to be integrated with other enterprise systems to form an integrated e-business system.

In a very mature CRM implementation, customer service representatives and other authorized employees have access to basic customer data, information on services provided and products purchased, and records of all interactions at various touch points—i.e., a complete 360-degree view of the customer. An integrated e-business system will give customers access to critical and real-time information related to their accounts, orders, etc. Communicational CRM really relies on a sound execution CRM so that questions and requests from customers can be addressed immediately. However, implementing a comprehensive and integrated customer database with high-quality customer data is a major endeavor that requires not only technical skills but also buy-in from various organizational units (Oracle, 2004; Talburt, et al., 2004).

Data hub, workflow, and Web services are key enablers for integrating various CRM subsystems (Peel, 2002). Data hub is one approach to providing an integrated view of customers from the data aspect, while workflow systems may be used to manage various activities and interactions required with customers in a timely and orderly manner. Web services are a new enabling

technology that supports the exposure of business functions and data through a standard Internet protocol—i.e., simple object access protocol (SOAP). Web services functions are defined in Web service description language (WSDL) so that they can be easily bound and invoked by other applications (Chen, 2003).

2.2.3 Intelligent CRM

The foundation of intelligent CRM requires the development of a customer-centric data warehouse containing subject area data from orders, problem tickets, etc. Data warehouses include two types—interactive and transactional. An interactive data warehouse contains data about customer queries, such as product queries, account queries, etc. It is mainly used for improving the productivity and service quality of call center or other interactive CRM functions. A transactional data warehouse contains historical customer transaction data that can be used for further analysis. ETL (Extract, Transform and Load) tools are used to move popular operational data stored in the customer activity management systems into the data warehouse. Intelligent CRM requires the building of data marts based on various subject areas extracted from data warehouse. Through online analytical processing (OLAP) and data mining tools, organizations use the information stored in data marts to support sales analysis, profitability analysis, product purchase trends, etc. Advanced data mining tools can be used to analyze customer sales and service data in the data warehouse for customer segmentation based on sales data, account activities, service records, etc. (Liautaud, 2001). Intelligent CRM focuses on the *business intelligence* aspect of customer information.

Business rules can be derived from data marts. They are feedback and are used by customer activity management systems to manage marketing campaigns (i.e., outbound customer interactions) and to improve the effectiveness of cross-selling and up-selling when handling in-bound customer interactions (SAS Institute, 2001). Intelligent CRM is particularly useful in supporting the targeting of new customers or targeting existing customers with new products and services. The business rules and information feedback from intelligent CRM to execution CRM and communicational CRM further improve the effectiveness of customer relationship management.

2.3 Aligned CRM Organizational Elements

The aligned organizational elements for a CRM system contain four major parts: structure, processes, culture, and the capability.

2.3.1 Structure

Structure refers to an identifiable, bounded set of methodically interrelated elements or principles with some intended purpose (Hoogervorst, Flier, and Koopman, 2004). Structures represent the formal system of control that embodies knowledge and principles for governance and that

represents the embedded system of management in an organization (Hoogervorst et al., 2004). Organizational effectiveness is considered dependent upon the establishment of proper structures and systems, which should be the primary area of concern (Robbins, 1990). In this research, structure is defined as the responsibility, function, management mechanism, and management policy elements of the organization. Many studies indicate that if the organizational structure is properly aligned the desired effects of CRM will be obtained (Chen and Popovich, 2003; Day, 2003; Goodhue et al., 2002; Reinartz et al., 2004; Rigby, Reichheld, and Schefter, 2002).

● *Functions*

It is not enough for a company to simply implement CRM processes. The company must organize itself to support these processes (Reinartz et al., 2004). The design of the structure should be focused around customer groups and service processes (rather than products, functions, or geographies) to ensure that their customers have a seamless interaction with all parts of the business (Day, 2003).

● *Accountability, job description, and employee roles*

A seamless connection with customers is often best achieved when accountability for the overall quality of customer relationships is clear (Day, 2003). Meanwhile, changes in job descriptions and employee roles are inevitable in CRM implementation (Goodhue et al., 2002; Kalakota and Robinson, 2000; Rigby et al., 2002), and so these changes should be clearly defined.

● *Performance measures and job evaluations*

With CRM systems, management must ensure that job evaluations are modified on a basis that facilitates customer orientation (Chen and Popovich, 2003). Performance measures must be restructured in order to better meet customers' needs (Rigby et al.,2002). Therefore, managers must establish the right metrics. A good approach is to have a portfolio of metrics that reveal the long-term profitability of the customers (Day, 2003). Companies can still measure customer loyalty and satisfaction, but they should supplement such metrics with those that determine the cost to acquire and serve customers as well as with proxies for direct measurements of loyalty and satisfaction—metrics on employee retention, customer complaints, and company performance on attributes that are important to customers, such as on-time delivery and service responsiveness (Day, 2003). The new metrics based on customer requirements could be added to traditional functional metrics, such as product reliability and compliance with standards (Day, 2003).

● *Incentive reward and compensation systems*

Several studies have emphasized that incentive structures, compensation programs, and reward systems must be modified on a basis that facilitates customer orientation and promotes CRM

(Chen and Popovich, 2003; Day, 2003; Goodhue et al., 2002; Kalakota and Robinson, 2000; Reinartz et al., 2004; Rigby et al., 2002). A critical determinant of an organization's ability to influence CRM-compatible activities and processes is the development of appropriate compensation schemes and organizational structures (Reinartz et al., 2004). Employees must be rewarded for engaging in CRM activities and customer-oriented behaviors (Reinartz et al., 2004).

2.3.2 Processes

A process is a grouping of ordered actions and decisions to produce an output which meets a specific objective. CRM is a continuous effort that requires redesigning core business processes, starting from the customer perspective and involving customer feedback (Chen and Popovich, 2003; Piccoli et al, 2003). To become truly "customer-centric" or build better relationships with customers, companies need to build cross-functional processes to better serve customers and address customer needs (Chen and Popovich, 2003; Gebert et al., 2003; Kalakota and Robinson, 2000; Kotorov, 2003; Goodhue et al., 2002; Rigby et al.,2002).

The effectiveness of CRM processes depends on the close link between front-line activities and internal operations such as product development, strategic planning, and financial processes. In addition to increased efficiencies in sales and marketing, service functions need to be fundamentally changed with regard to their competencies relative to the CRM strategy (Tan, Yen, and Fang, 2002). The goal is to make it easy for the front line to carry the voice of the customer deep into the organization and to use this information to guide processes (Kalakota and Robinson, 2000).

Based on a content review of 74 reported CRM cases those aligned processes include dynamic R&D, reliable demand forecast, well-planned production, expanded delivery networks and consistent customer service throughout the service cycle (Shang and Lin, 2005). With regard to marketing and sales processes, because these processes are the focal point of CRM, companies should pay more attention to design and execute them according to CRM. Based on Reinartz et al. (2004)'s definition of CRM processes, we consider that marketing and sales should comprise formalized processes to manage the initiation and maintenance of customer relationship. The processes at the customer relationship initiation stage include customer evaluation, customer acquisition, and referral management, and the processes at the customer relationship maintenance stage include customer evaluation, customer retention, up-selling/cross-selling, and recovery management.

2.3.3 Culture

Culture means the shared beliefs, values, attitudes, and behavior that are characteristic of an organization. Implementation of enterprise technology such as CRM requires changes to organizational culture (Al-Mashari and Zairi, 2000). CRM is an enterprise-wide, customer-centric business model that must be built around the customer (Chen and Popovich, 2003), and so

companies must make a transition from a product-focused culture to a customer-centric culture (Chen and Popovich, 2003; Goodhue et al., 2002; Kalakota and Robinson, 2000; Reinartz et al., 2004; Rigby et al., 2002). In a product-focused approach, the goal is to find customers for the products using mass marketing efforts, but in a customer-centric approach, the goal becomes developing products and services to fit customer needs (Chen and Popovich, 2003). A customer focus needs to be brought deeper into the functional areas of the company; it cannot be isolated among marketing managers (Reinartz et al., 2004). The most important indicator of an organizational focus on customers is the shared belief that customer retention is a high priority for everyone, not just a concern to be delegated to marketing or sales departments (Day, 2003).

Terms such as market-oriented, customer-focused, market-driven, and customer-centric have become synonymous with proactive business strategy in firms worldwide (Deshpande, 1999). Market orientation has been defined, and hence measured, from two interrelated levels of organization: the group teamwork pattern and the individual performance of customer-related processes (Shang and Lin, 2005).

Market orientation at the team level contains three levels of customer-focused actions (Homburg and Pflesser, 2000; Kohli, Jaworski, and Kumar, 1993): (1) market intelligence generation refers to customer interaction, customer information gathering, and review of environment change; (2) market intelligence dissemination refers to cross-departmental data sharing, formal and informal organization-wide communication, and customer information circulation; and (3) market intelligence responsiveness is reflected in decisions on price and product change, business plans, and customer responsiveness. The important indicator of an organizational focus on customers is the openness of the organization to sharing information about customers (Day, 2003).

Market orientation at the individual level is reflected in employee empowerment. Employee empowerment refers to employees' being more proactive and self-sufficient in assisting an organization to achieve its goals (Herrenkohl, Judson, and Heffner, 1999). In an integrated working environment, people will break out of narrow job specifications to find new and better ways of contributing to key business processes, changing and modifying them in the pursuit of good service, improved quality, and value (Gandz, 1990).

2.3.4 Capability

Capability means the ability needed to accomplish the CRM-related activities or make CRM function well. A CRM process can involve three fundamental steps (Tan et al., 2002): (1) understanding customers completely, (2) aligning organizational capabilities in order to better deliver what customers may perceive as heightened value, and (3) facilitating the immediacy of information availability both inside and outside of the organization.

Plakoyiannaki and Tzokas (2002) proposed that the following set of capabilities determine the success of the CRM system.

- *Learning and market-orientation capabilities*. Market-orientation and learning capabilities are closely related and deeply embedded in the CRM system. Customer insight generation occurs through learning and requires information inputs, which are converted by the players involved into information outputs for sense or decision-making purposes. The commitment to customer and learning goals can be demonstrated in attentive listening to customer response across all channels and points of interaction in order to measure and improve corporate performance.

- *Integration capabilities*. The capability of 'Weaving' business processes together mandates integration. CRM is an organization-wide investment and potentially all individuals and organizational units contribute to the CRM processes. Hence, inter-functional coordination based on alignment of functional areas, promotion of interdepartmental connectedness, information sharing and strategy integration is an imperative for supplying superior value to customers. Additionally, the use of shared resources with other business units presupposes integration of all business systems starting from back-office infrastructure and extending to frontline systems and channels of interaction.

- *Analytical capabilities*. Analytical capabilities are linked to technological artifacts and knowledge and play an active role in enhancing relationships with customers. They facilitate the acquisition and transformation of information to aid customer knowledge discovery and the development of clear market segments and portfolios. Most importantly, analytical capabilities enhance profitability maximization from customer relationships because they enable firms to link investments in customer relationships more directly with the return they generate.

- *Operational capabilities*. Operational capabilities utilize and enhance resources. They are skills developed at functional and administrative levels that translate customer information into service offerings. Operational capabilities cut across the customer value process.

- *Direction capabilities*. The direction capability is the compass for the course of the CRM system and the organization. Direction capabilities depend upon strategic skills and reflect the sharpness of corporate long-term vision and organizational values. They ensure that the value proposition of the firm truly differentiates the offering in the eyes of the customer.

2.4 Customer Management Activity Mapping to Enterprise CRM

Customer management activities (CMA) are related to core business processes that are critical in serving customers throughout the life cycle of a customer. It is the reason for the existence of a

CRM system. Within these phases, customers develop specific needs in terms of products and services offered by the firm. By accommodating to the changing customer portfolios of product and service, companies can gain a competitive advantage. Companies that actively manage customer life cycles serve their customers better and achieve better customer penetration rates. Some companies in the financial industry even take the life cycle concept to another level by tracking the life-style or life-changing events of a customer (e.g., attending college, beginning to work as a young professional, getting married, having a baby, retiring, buying a home or car, etc.) in order to offer tailor-made products bundled for each phase of the customer's life (Roland Berger Strategy Consultants, 2005).

Therefore, an in-depth understanding of CMA is essential for successful implementation of CRM (Woodcock and Starkey, 2004). The best way to classify CMA is based on the analysis of the life cycle of a customer as depicted in Figure 2-3. The basic functions of these activities and the support from the CRM system are listed in Table 2-1. Most of the activities require all three components working together to maximize the benefits. However, Table 2-1 only lists the critical CRM components required for each activity.

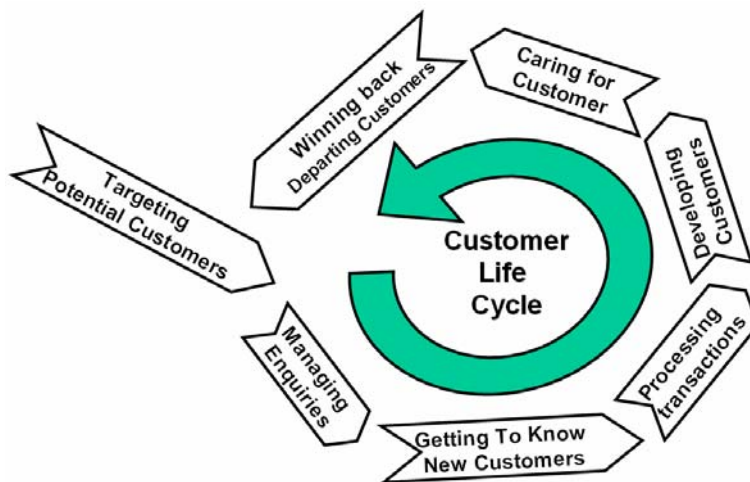**Figure 2-3. Customer Management Activities Based on the Customer Life Cycle**

Table 2-1. Mapping of Customer Management Activities and CRM Components

Customer Management Activities	Basic Functions	Mapping to Key CRM Components Required
Targeting new customers	☑ Segmenting new customers for target marketing ☑ Acquiring new customer data e.g., names, phone number or email address	▪ Intelligent CRM, ▪ Outbound communicational CRM
Managing enquiries	☑ Managing marketing campaign responses to evaluate effective of these campaigns ☑ Processing enquiries from new customers	▪ In-bound communicational CRM ▪ Execution CRM
Getting to know new customers	☑ Registering new customers ☑ Educating new customers about products and services	▪ Communicational CRM (both inbound and outbound)
Processing customer transactions	☑ Processing customer orders ☑ Updating customer profiles	▪ Inbound communicational CRM ▪ Execution CRM
Developing customers	☑ Segmenting existing customers based on their purchasing history for target marketing of new products or services to them ☑ Identifying new products or services for up-selling and cross-selling while interacting with customers	▪ Outbound communicational CRM ▪ Intelligent CRM
Caring for customers	☑ Tracking customers problems or special service requests ☑ Managing the workflow required to resolve problems encountered by customers ☑ Analyzing frequently occurred problems to identify product redesign opportunities	▪ Inbound communicational CRM ▪ Execution CRM
Winning back departing customers	☑ Gathering reasons for customers' departure ☑ Analyzing the reasons for customers' departure	▪ Inbound communicational CRM ▪ Intelligent CRM

2.5 Integration of CRM Technology Elements

2.5.1 Integration Between Communicational CRM and Execution CRM

The effective management of information has a crucial role to play in CRM (Chen and Popovich, 2003). Information about customers generated from different systems should be integrated and smoothly distributed throughout the organization. The objectives of integration between communicational CRM and execution CRM are to effectively utilize the information from different customer interactions to continuously improve value-generation processes and to provide integrated and real-time support to front-end customer requests and services. The mission of integration between communicational CRM and execution CRM is to integrate the various customer-contacting channels as well as the various customer value-generation applications, as follows.

●   *Integration of various customer-contacting channels and operational data*

Several studies have indicated that building a comprehensive, centralized, and integrated repository of all relevant customer data from different sources should be top priority when implementing CRM (Chen and Shang, 2005; Day, 2003; Goodhue et al., 2002; Kalakota and Robinson, 2000; Ling and Yen, 2001). The ability to access, manage, and process all relevant customer content, including structured and unstructured customer data, has emerged as a key requirement for CRM applications today (Kalakota and Robinson, 2000). Non-transactional information is equally as valuable as the transactional data. Such data may include general inquiries, support calls, suggestions, and complaints (Xu and Walton, 2005). The data must be captured, integrated, and stored from all in-bound touch points, including the Web, call centers, stores, and ATMs (Goodhue et al., 2002). Therefore, companies must build a centralized repository and continuously synchronize it with all customer data sources to give users a single view of customers (Chen and Shang, 2005). Integrated customer data should be available through IT systems in all parts of the company. The data infrastructure provides a structure of logical consistency that enables data sharing across the applications and business processes (Goodhue, Wybo and Kirsch, 1992). CRM technologies can help companies to gain a coherent and comprehensive picture of customers, to better organize internal data to cut service costs, to enable sales people close deals faster, and to improve the targeting of marketing programs (Day, 2003).

●   *Integration among CRM, ERP, SCM, and other application systems*

Integration among CRM, ERP, and SCM is crucial (Chen and Shang, 2005; Huang, Yen, Chou, and Xu, 2003; Tan et al., 2002). Integration between CRM and ERP allows the sales department to access ERP information to be more aware of what is happening to the customer, and the production department is able to stay better informed about customers' reactions. In addition, CRM may provide information to ERP that will help it to prioritize work processes to optimize

services to preferred customers, which can further enhance the relationships with these customers (Huang et al., 2003). Effective SCM facilitates CRM by offering customers good–quality, low-price products through speedy distribution channels (Tan et al., 2002). Successful CRM provides information for SCM's demand forecasting and delivery designing (Tan et al., 2002). Suppliers may also take advantage of the integration to better schedule the delivery of raw materials and to prioritize material flow to enhance service to profitable customers (Huang et al., 2003). All the above operational systems including other customer value-generation applications, must be integrated into the CRM infrastructure to build a complete customer support system (Kalakota and Robinson, 2000).

2.5.2 Integration Between Execution CRM and Intelligent CRM

The purposes of integration between execution CRM and intelligent CRM include supporting the decision-making process of the entire value chain processes and capturing and consolidating the operational results and feeding them back into the intelligent CRM for critical decisions. To achieve these goals, the integration between execution CRM and intelligent CRM should be accomplished through the following moves.

● *The development of a customer-centric data warehouse completely integrating the operational data sources.*

To be successful in the knowledge acquisition phase of CRM, IT will need to integrate many legacy and external data sources, most often through data warehousing technologies (Ling and Yen, 2001). A data warehouse is an information technology management tool that gives business decision makers instant access to information by collecting "islands of customer data" throughout the organization by combining all database and operational systems such as human resources, sales and transaction processing systems, financials, inventory, purchasing, and marketing systems (Chen and Popovich, 2003). Data warehouses extract data from transaction systems and aggregate information so it can be effectively analyzed (Kalakota and Robinson, 2000). A data warehouse supports generic applications such as reporting, queries, OLAP, and data mining, as well as specific applications such as campaign management, churn analysis, propensity scoring, and customer profitability analysis (Goodhue et al., 2002).

● *Integrating analysis tools with operational systems.*

The analysis of the data will require tools such as OLAP, data mining, statistical analysis tools, and other complementary tools to report, analyze, and unearth hidden trends in the data (Ling and Yen, 2001). These technologies provide support to determine appropriate customer decisions based on accumulated relationship data. Integrating these technologies with operational front-end and back-end systems provides the necessary seamless collaboration (Ling and Yen, 2001).

2.5.3 Integration Between Intelligent CRM and Communicational CRM

Through the integration between intelligent CRM and communicational CRM, companies can build a complete view of customers and provide quick access to the data, utilize the channel to interact with customers, and quickly update the intelligent CRM with information from the customer front-end. The integration between intelligent CRM and communicational CRM includes two aspects, as follows.

● *The smooth link between the data warehouse and the customer front-end.*

In addition to the integrated customer database with customer operational data, call center agents sometimes look into the warehouse to request information on the customers about their purchases, their transaction histories, and their histories of complaints. Therefore, a smooth link between the data warehouse and the customer front-end is necessary for optimal interaction with customers.

● *Good use of CRM activities analysis for better customer interaction.*

Customer intelligence facilitates the optimization of customer interactions, which helps in customer retention and in promoting the right mix of product offerings to the right customers, at the right time, and through the right channels (Chan, 2005). The results of business analysis of customer contacts, services, marketing campaign responses, and channel promotions are produced by the intelligent CRM to further improve the effectiveness of the communicational CRM (Chen and Shang, 2005).

2.6 CRM Value

It has been reported that many businesses have invested in various CRM elements but that they did not seem to realize the benefits. Although time lag in the benefit realization process could be one of the reasons for this, as many reports have pointed out, the misconception of treating CRM management as an operation automation project has generally been noted with regard to CRM projects. Focusing on call center productivity, service quality, and response time, while leaving out the needs for business involvement and evolvement, could be the fundamental reason for the low benefits as well as low investment in CRM in the past few years. Hence, the measurement of CRM is misled by operational indexes such as call center productivity, service quality, and customer response time.

Several studies have proposed ways of measuring the value of CRM. Chen and Ching (2004) proposed that the performance of CRM could be measured by organizational benefits (profit increases, reduced costs, new opportunities) and customer benefits (social benefits, psychological benefits, economic benefits, customization benefits). Winer (2001) indicated that CRM-based measures should include customer acquisition costs, conversion rates (from lookers to buyers), retention/churn rates, same-customer sales rates, loyalty measures, and customer share or share of requirements (the share of a customer's purchases in a category devoted to a brand).

In reality, managing customer relationships effectively and efficiently boosts customer satisfaction and retention rates (Jackson, 1994; Levine, 1993; Reichheld, 1996a, b). The rewards of executing an effective CRM program are largely self-evident: increased customer value, higher customer retention, increased customer recruitment, and ultimately higher profitability (Ling and Yen, 2001). Companies that successfully implement CRM will reap the rewards in customer loyalty and long-run profitability. The CRM value should be reflected in a combination of both qualitative and quantitative indexes.

2.7 Research Propositions

To realize the best of its customer relationship management, a firm must make enterprise-wide, customer-driven, technology-integrated, cross-functional efforts (Chen and Popovich, 2003). Based on past research the following two propositions are formed to explain how businesses manage the technology and organizational elements to obtain lasting value from a complicated CRM system.

Proposition 1: The greater the integration among CRM technology elements, the greater will be the value generated from the infrastructure.

CRM integrates a number of different technologies, in both data acquisition and analysis, as well as in the creation and maintenance of the many touch points to the customer. This means integrating many technologies, groups, and disciplines to build a successful system (Ling and Yen, 2001). The effectiveness of CRM depends upon the close link between front-line activities and internal operations. The goal is to make it easy for the front line to carry the voice of the customer deep into the organization and to use it to guide processes (Kalakota and Robinson, 2000). CRM systems accumulate, store, maintain, and distribute customer knowledge throughout the organization (Chen and Popvich, 2003). The effective management of information has a crucial role to play in CRM. Information is critical for product tailoring, service innovation, consolidated views of customers, and the calculation of customer lifetime value (Peppard, 2000).

On the analytical side, a confluence of multiple disciplines, including a data warehouse, OLAP, data mining, and other complementary technologies, have enabled marketers to sift through mountains of data to extract invaluable information and knowledge about their customer base. Integrating these technologies with operational front-end and back-end systems provides the necessary seamless collaboration and the IT challenge that comes along with it (Ling and Yen, 2001).

Therefore, the integration of CRM technology elements places emphasis on how to make information flow fluently between different CRM technology elements. In this research, the integration of CRM technology elements is measured by the extent of information integration.

The integration among CRM technology elements is depicted in Table 2-2.

Proposition 2: The better the alignment between technical and organizational CRM elements, the greater will be the value generated from the infrastructure.

Organizational transformation is necessary for the organization to take full advantage of the CRM capabilities provided. Changing the technology without transforming the organization will have less than optimal impact (Goodhue et al., 2002). CRM requires companies to adopt customer-centric philosophies, to change their structures and processes, and to alter their corporate cultures accordingly (Rigby et al., 2002). In addition, aligning organizational capabilities in order to better deliver what the firm's customers may perceive as heightened value is a fundamental step in implementing CRM (Tan et al., 2002). To remain competitive and maximize profits, companies must align people, processes, strategy, and technology and search for innovative, cost-effective ways to build, retain, and deepen the lifetime value of customer relationships (Kalakota and Robinson, 2000). Achieving a successful CRM environment needs not only the critical success factors analyzed but also some practical aspects, especially the cooperation of IT and other functionalities within the enterprise (Lin and Yen, 2001).

The alignment of organizational elements is described in Table 2-3.

Table 2-2. Integration among CRM Technology Elements

Linkage of CRM Elements	Objective	Description	Information Transferred	IT Integration
Communicational ←→ Execution	● Effectively utilizing the information from different customer interactions to continuously improve value-generation processes ● Providing integrated and real-time support to front-end customer requests and services	● Capturing and sharing the interaction information within an organization (e.g. service requests, customer enquiries, complaint, and advise) ● Gathering the interaction information to identify the improvement opportunities (e.g. marketing, sales, service, delivery, or new product developments) ● Consolidating all relevant data required to interact with customers (e.g. service provided, order status, and purchasing history) ● Sales, order fulfillment, product delivery, returns and other value chain activities support the communicational CRM	● C → E: Human interaction-based knowledge (knowledge from customer) ● C ← E: Transaction-based data about customer	● Integration of various customer-contacting channels and operational data ● Integration among CRM, ERP, SCM, and other application systems
Execution ←→ Intelligent	● Supporting the decision-making process of the entire value chain processes ● Capturing and consolidating the operational results and feeding them back into the intelligent CRM for critical decisions.	● Customer analysis (e.g. customer profiles, customer segmentation, transaction history analysis, behavior modeling, churn analysis, and customer profitability analysis) ● Market and product review ● Marketing campaign analysis ● New product and services ● New market ● New channels ● Marketing campaign and promotions ● Identifying products or services for cross-selling and up-selling	● E → I: Transaction-based data about customer ● E ← I: Knowledge derived from transaction-based customer data (knowledge about customer)	● The development of a customer-centric data warehouse completely integrating the operational data sources ● Integrating analysis tools with operational systems

Communicational ↔ Intelligent	● Building a complete view of customers and providing quick access to the data ● Best utilizing the channel to interact with customers ● Quick updating the intelligent CRM with information from the customer front-end	● Guiding and supporting the marketing campaign, promotions, cross-selling and up-selling executed by communicational CRM ● Conducting survey ● Contact information analysis ● Service analysis ● Marketing campaign responses analysis ● Channel promotions analysis	● C → I: Human interaction-based data about customer (e.g. survey response data or customer service history) ● C ← I: Knowledge derived from transaction-based or interaction-based customer data (knowledge about customer)	● The smooth link between the data warehouse and the customer front-end ● Good use of CRM activities analysis for better customer interaction

Table 2-3. Alignment of Organizational Elements of CRM

Organizational Element	Alignment
Structure	• Functions • Accountability, job description, and employee roles • Performance measures and job evaluations • Incentive reward and compensation systems

Processes	• Sales and Marketing
	  ✧ Customer relationship initiation
	    ➢ Customer evaluation
	    ➢ Customer acquisition
	    ➢ Referral management
	  ✧ Customer relationship maintenance
	    ➢ Customer evaluation
	    ➢ Customer retention
	    ➢ Up-selling/Cross-selling
	    ➢ Recovery management
	• Inbound Logistics
	  ✧ Work closely with front-end departments for planning procurement and managing warehouse
	• R & D
	  ✧ Collect market and customer information from all business functions
	• Production
	  ✧ Cross-departmental planning and proactively share information with other departments
	• Outbound Logistics
	  ✧ Shared on-demand access to customer data from any location by all partners
	  ✧ Employees empowered in serving customers
	  ✧ Staff and managers have access to all the data they need to keep customers happy, which made staff more proactive in solving customer problems
	• Customer Service Fulfillment
	  ✧ Tightly-built chain of service information
	  ✧ Empowered employees in fulfilling customer requests
	  ✧ Employees coordinate with departments in serving customers

Culture	• Market-orientated culture
	  ✧ Team level
	    ➢ Market intelligence generation
	    ➢ Market intelligence dissemination
	    ➢ Market intelligence responsiveness
	  ✧ Individual level
	    ➢ Employee empowerment

Capability	• Learning and market-orientation capabilities • Integration capabilities • Analytical capabilities • Operational capabilities • Direction capabilities