

# Preface

## OVERVIEW

In facing the 21<sup>st</sup> Century's competitive, dynamic, and complex business environments, organizations seek to create a "difficult-to-imitate" sustainable competitive advantage (SCA) through effective leveraging of organizational distinctive core competencies (DCCs). In dynamic business environments, enterprises face the challenge of rapidly adapting to, that is, increasing demands of customers concerning quality and innovativeness of products and services. In combination with global competition, customers change the rules of the market and force companies to adapt swiftly (Österle, 2001). This challenge and rising internal pressures, for example to improve efficiency of operations, also require enterprises to redesign their competitiveness model to focus on value-adding customer processes. Focusing on customer processes requires knowledge of considerable extent. Customer-centric companies need to provide knowledge that customers require, process the knowledge that customers pass to the company and possess knowledge about customers. As a consequence, knowledge is considered a DCC in the competition of the 21<sup>st</sup> Century (Drucker, 1999; Davenport and Prusak, 1998).

Due to the dramatic shifts in the knowledge economy and global competition, the most valuable resource that creates SCA for a business organization is becoming what it *knows* not what it *owns*. Customers are the lifeblood of any business organization. The importance of customers to business firms in the digital economy has created tough "rivalries" over acquiring new customers and/or retaining/expanding relationship with current ones. Customer-driven companies need to harness their capabilities to manage the knowledge of those who buy their products (Baker, 2000; Davenport and Klahr, 1998). In the accelerating shift towards customer-centric organizations, strategies are redesigned, organizations restructured, and a process view of a business replaces functional perspective as a means of organizing work around customer processes, that cut across functional areas, with the aim of developing Customer Knowledge (CK) from information flow via advanced Information and Communication Technologies (ICTs). CK, in turn, is becoming a major weapon for

providing value-adding products and/or services that seek to serve each customer in his/her preferred way and to enhance customer satisfaction and loyalty.

In facing dynamic and complex business environments, proponents of the resource-based view to strategy have proclaimed that a company can be best conceptualized as a bundle of unique resources, or competencies, rather than as a bundle of product market positions (Barney, 1991). Nonetheless, many contributors to the resource-based view of the firm question this one-sided thinking about the locus of competence (Prahalad and Ramaswamy, 2000; Inkpen, 1996). It has recently been claimed that such competence actually moved beyond corporate boundaries, and that it is worthwhile to also look for competence in the heads of customers, rather than only in the heads of employees. Although Customer Relationship Management (CRM) has been traditionally popular as a means to tie customers to the company, but left perhaps the greatest source of value under-leveraged, viz. the knowledge residing in customers (Gibbert et al., 2002).

In the context of CK, customer is broadly defined as an organization's stakeholders such as consumers, suppliers, partners, joint ventures and alliances, and competitors. In some cases, a customer may not have a current relationship with the organization, but one is likely to develop in the future (Paquette, 2005a). CK can be explicit or tacit, and individual or group knowledge based on the model presented by Cook and Brown (1999). Explicit knowledge is easily codified, transferred, and understood by multiple individuals, where tacit knowledge requires experience and practice in order to flow from one individual to another. Both of these forms of knowledge can reside at the individual level, or be created and transferred between different groups. Knowledge derived from customers through an interactive and mutually beneficial process is referred to as CK. CK can be composed of a combination of CK, supply chain knowledge, joint venture specific knowledge, and so forth. This knowledge is created within a two-way flow of knowledge which creates value for both parties (Paquette, 2005a). CK gave birth to a relevant field of research as it supports customer processes and cultivates concepts and technologies of Knowledge Management (KM) and CRM (Romano and Fjermestad, 2002).

CK can also be divided into four types (Davenport et al., 2001; Garcia-Murillo and Annabi, 2002; Gibbert et al., 2002; Desouza and Awazu, 2005; and Smith and McKeen, 2005): knowledge *for*, *from*, *about*, and *co-creation* with customers. Knowledge *for* customers is a continuous flow of knowledge directed from the company to its customers in order to support customers in their buying cycle. Knowledge *from* customers refer to customers' needs or consumption patterns of products and/or services that have to be incorporated by the company for product and/or service innovation and development. Knowledge *about* customers encompasses the customer's past transactions, present needs and requirements, and future desires. Knowledge *co-creation (with customers)* refers to a two-way business-customer

relationship for the development of new knowledge or a new product, for example Microsoft shares its “beta-ware” version with customers in order to learn with them and debug the software.

CRM is a relationship-based strategy that has flourished in recent years. CRM integrates order and sales, marketing, and service processes, in order to establish a profitable and longer relationship with customers or suppliers. CRM itself should not be only seen as a technological solution, although ICT is required to enable the integration of customer-facing processes. CRM *content* technology enables a company to integrate a large volume of customer information and to efficiently transform this information into useful knowledge. CRM *contact* technology also enables a company to interact with its customers in ways that provide value to the customer as well as to make it easier for the customer to do business with the company.

As companies grow and interact with more and more customers through increasingly diverse media and channels, having a systematic approach to manage CK becomes critical. Customer Knowledge Management (CKM) is needed not to capture simple transactional information, that is by CRM systems, but to extend the formation of strategic partnerships and to develop new products. CKM refers to the methodologies and systems employed in the acquisition and distribution of valuable customer derived information and knowledge concerning the provisioning of customer services or products throughout an enterprise. CKM is described as the creation of new knowledge gained by companies and their customers sharing platforms and processes (Paquette, 2005b).

CKM is also different from traditional KM in the objective pursued. Whereas traditional KM is about efficiency gains that avoids “re-inventing the wheel”, CKM is about innovation, and creation of growth opportunities for the corporation through partnering with existing customers (e.g., cross-selling and up-selling), or through acquiring new customers and getting engaged in an active and value-creating relationship with them. CKM contrasts the desire of traditional CRM to maintain and nurture existing customers and the belief that “retention is cheaper than acquisition”. However, retention often becomes increasingly difficult in an age where competitors’ offerings are close imitations and only three mouse-clicks away (Gibbert et al., 2002).

## THE CHALLENGES

Building the customer-centric knowledge-intensive enterprise is not a simple task and it poses real challenges to organizations. Although transformation to a CKM-based organization is sound theoretically, its implementation suffers in practice from some pitfalls. Implementing a CKM strategy represents a real challenge as it

does not happen over a short period of time like implementation of any ICT-based project. CRM systems frequently have been accused for over-promising but under-delivering. The transformation towards a knowledge-enabled, customer-centric organization may face a number of challenges in such areas as absence of an overall KM strategy, knowledge hoarding corporate culture, inaccurate identification of business requirements, stovepipe or functional structure, lack of business process integration, weak customers' expectations and satisfaction, shortage in meeting knowledge needs of power users, poor quality of data, inertia/resistance to change, fear of job loss, excessive vendors' involvement, and ineffective formal organizational roles (Al-Shammari, 2005).

The most significant challenges in implementing CKM effectively are organizational, not technical. Smith and McKenn, (2005) found that the four major hurdles that must be overcome: structural challenges, cultural challenges, competency challenges, and privacy concerns. Transforming a product-centric organization into a customer-centric organization is easier said than done as companies may end up becoming customer-focused only by terms that are defined by the companies themselves not by their customers. Some companies may be concerned about the profitability of focusing on customers rather than on selling products, or may have poor alignment of their rewards and goals with a customer perspective. Some companies may shy away from customer-centricity because of corporate narcissism, that is, a sense that "we know better than our customers" (Gibbert et al., 2002). Furthermore, not all companies want to hear what their customers really think of their products, services, image, and credibility. Skills and competencies for CKM must be used in the collection, creation, dissemination, and usage of CK. However, companies do not often take full advantage of the knowledge sources they have, for example, communities of practice, alumni, retirees, and front line workers. Since much of CKM is based on developing a trusting relationship with each customer, organizations should take privacy dimension into consideration. Companies must understand not only the legal guidelines around how customer data is protected but also how customers feel about how a firm uses their information. For example, too much customization may make some customers feel uncomfortable with what a company knows about them (Smith and McKenn, 2005).

Paquette (2005a) identified several cultural challenges in CKM implementation. He argued that CKM faces cultural challenges of sharing CK at the individual, group, or organizational level. Firms may experience a challenge of perceiving customers as a source of knowledge, not just revenue as reflected in the "not invented here" concept, which demonstrates an unwillingness to accept externally generated ideas (Paquette, 2005a). Other companies fear showing internal processes to customers such as suppliers or alliance partners, so they control what the customer sees to be afraid of giving away strategic secrets to the marketplace (Gibbert et al., 2002).

Besides cultural influences, a firm may face the obstacle of not having the competency required to absorb and utilize the external knowledge. Cohen and Levinthal (1990) argue that a firm's absorptive capacity, or its ability to absorb new knowledge, is a function of the firm's prior knowledge that allows it to recognize and synthesize new knowledge. Also, ICTs may not be able to handle the transfer of knowledge from external sources, as most knowledge sharing support systems are only designed for internal use. Control of content may be lost, as external knowledge transfer can push the locus of control beyond a firm's boundaries (Gibbert et al., 2002). Thus, organizations can be quite reluctant to open up these systems, as technical challenges occur without a universal integration and security mechanism that interfaces with both parties' systems (Paquette, 2005a).

Desouza and Awazu (2005) identified four major challenges to CKM: segmentation, integration, distribution, and application. The challenge in information-rich cultures is to find the right categories on which to segment data prior to analysis. The attributes used to segment customer data are transient; an attribute that is important today and may not be so tomorrow. The problem with dialogue is that customers cannot articulate what they want – they don't realize they need something until the innovative product offers it to them. Novice computer shoppers differ from superior ones in terms of CK needs. So providing the same level of knowledge to both customer groups will lead to frustrated user experiences. In the context of knowledge from customers, the business firm must be able to segment its users based on how they consume the product and/or service; into beginners, intermediate, expert and lead users. Segmenting users in this manner allows the business firm to get a better sense of how to manage the incoming knowledge from each group. The challenge for knowledge from customers is to integrate the various contact/delivery channels. It is more common to find discrepancies in the information than to find that customer information coming from multiple sources synchronized. The challenge is to integrate the various channels, media, and methods for delivery of CK. The Internet and mobile phones allow customers to no longer be restricted in the media they can use to find information about products and/or services. To ensure a company can communicate with its customers through disparate mediums and in multiple languages, its CRM systems must be compatible with multiple environments, platforms, and systems. The challenge in distribution of knowledge about customers is to communicate it in usable formats according to different requirements and uses. A significant problem with knowledge about customers is privacy. How does a company ensure it uses the information it gathers in a responsible way? Customers share information willingly when they believe it will be used to provide them with better support, products, and/or services. They are reluctant to share it when they think it will be used in unauthorized or hidden ways.

## SEARCHING FOR A SOLUTION

Change occurs frequently in most large and small companies. The problem arises when it is not always well planned or deliberately executed. This is especially true when change is reactive to events rather than proactive in anticipating or even creating them. The situation aggravates when organizations do not invest much in planning, pursue change haphazardly, and adopt ICT-based generic or ready-made change initiatives. Companies usually benefit more from change they are prepared for versus change that is imposed on them. In order to prepare for change, companies should also learn how to identify the need for change and how to manage it successfully. This learning capability will allow companies to address future problems and take advantage of opportunities more quickly and effectively than their competitors.

In the search for a suitable solution, the role of researchers is to redefine and refine frontiers of knowledge and research by pushing a line of argument to develop an alternative approach to things rather than to prove a particular approach as a more absolute truth. Several approaches and directions have been taken by researchers in managing CK as a source of developing durable and profitable relationships with customers. This book discusses and analyzes these approaches and proposes CKM as a “multiple-paradigms one-solution” holistic business framework. A business model or framework is conceived as a high-level approach to conduct business, wherein a company can leverage its DCCs to create an SCA. The model clearly outlines how a company adds value by creating new, or revising existing, products, services, and/or processes. The CKM framework is thought to be helpful in organizing thoughts related to building blocks of several interdisciplinary subjects and identifying the interacting relationships between these building blocks. The strategic point of the CKM framework is that businesses are looked at as a vertical value chain, moving from resources through to the customer, and broken down into tiny segments with the SCA achievement as an ultimate aim.

CKM has been recently utilized as the main proactive approach to face drastic and too fast globalization, competitive environments, and changing customer's preferences. The basic theme behind CKM is to utilize DCCs of organizations, that is, knowledge, to add value to customers as well as to companies by delivering the *right* product and/or service, at the *right* price, to the *right* customer, at the *right* time and location, and through the *right* distribution channel. CKM results from the integration of intervention techniques and methodologies rooted in people, process, and technology, viz. Business process Reengineering (BPR), ICTs, KM, and CRM, and aims at maximizing value for customers and creating profitable and enduring relationship with them. Successful CKM change requires transformation of organizations from “product-centric” to “customer-centric” strategy, from “vertical”



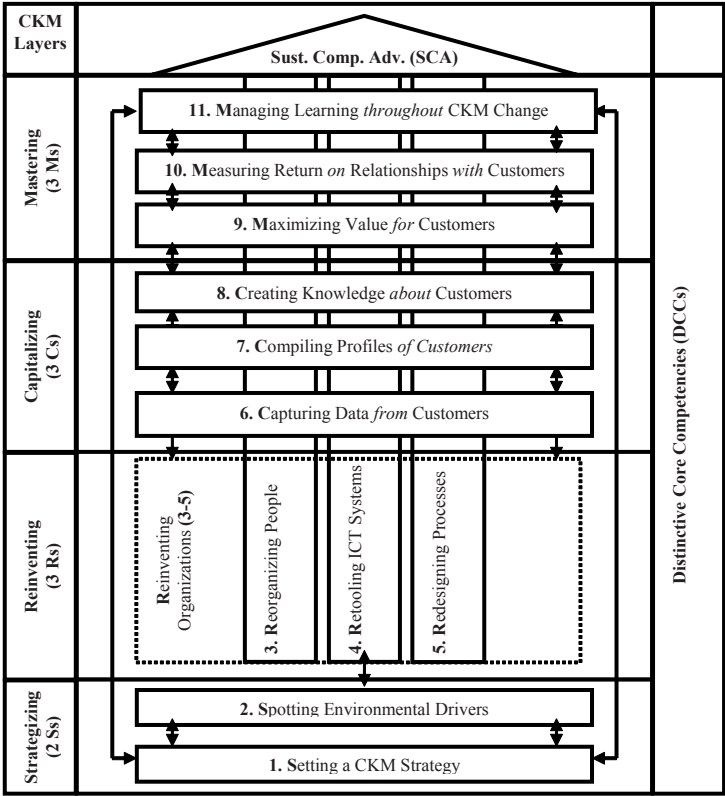
to “network” structure, from “individualistic” to “collective” work, from “hoarding” to “sharing” culture, from “ceremonial” to “results-oriented” practices, from “functional” to “process” work orientation, and from “centralized” to “distributed” computing.

While CRM systems are typically used to target daily customer transactions, CKM is presented to leverage knowledge-enabled customer-business transactions from a strategic level, viz. generating, sharing, and applying CK. CKM is not a tool (like CRM), but a strategic process that is designed to capture, create, and integrate knowledge about and for customers dynamically. CKM is introduced as a principal approach that amalgamates BPR ICTs, KM, and CRM and in order to leverage DCCs in the quest for achieving SCA in today’s competitive business world. CKM is a strategic process that seeks to gather and analyze customer data from customer-facing business processes, and then to generate knowledge needed to create value to customers through providing customized products, services, and/or processes.

CKM is not just about customer data nor is it just about customer relationships, viz. social (people-based) or transactional (technology-based); rather, CKM is a knowledge-based business strategy enabled by a holistic organizational reinvention manifested by changes in people, structure, processes, and technology. Research specifically on the concept of CKM has shown growing appearance in the literature. Major CKM contributions include Garcia-Murillo and Annabi, (2002), Gibbert, et al. (2002), Rowley (2002 a,b), Kolbe, et al. (2003), Roscoe (2003), Bueren, et al. (2005), Desouza and Awazu (2005), Paquette (2005), Smith and McKen (2005), Chen and Su (2006), Su and Chen (2006), and Lopez-Nicolas and Molina-Castillo (2008).

The proposed CKM framework (Figure P0.1) presents a unified frame of reference that integrates dynamic interactions among basic organizational pillars of people, processes, and technology in pursuit of the enrichment of the CK wealth of organizations. Double-arrow flows are used to show intra- and inter-connections and integration between different parts, or elements, of the framework, and also serve as unifying glue for various elements of the framework. Double-arrow flows are needed to reflect the fact that building the value of customers increases the value of the demand chain knowledge and the stream of business activities that flow in the opposite direction to the supply chain knowledge, that is from the customer up through the retailer all the way to the manufacturer. However, it should be noted here that boundaries or dichotomies between or within different parts of the framework are blurred. Therefore, an imaginary blurred rather than definite line needs to continue to be kept in mind when analyzing CKM.

Figure P0.1. A schematic diagram for the CKM framework



## BOOK STRUCTURE

This particular four-stage perspective of the CKM framework is adopted as a base for organizing the book into various chapters. The CKM layers are organized in four coherent parts abbreviated as SRCM (Strategizing, Reinventing, Capitalizing, and Mastering), with each part divided into two or three chapters as follows:

Section I – Strategizing –This section explores concepts, issues, and trends surrounding the strategy and its environmental drivers of the CKM change (2 Ss): The chapters belonging to this section are chapter I and II.

Chapter I addresses background concepts, critical issues, and future trends related to the blueprinting of a CKM strategy. CKM is a knowledge-based strategy for anticipating and meeting customers’ needs profitably. It deals with issues such as major organizational components (people, structure, process, and technology), intellectual (staff) capital and relationship (customers) capital of organizations.

Chapter II examines the importance of business environmental conditions in driving organizational change, such as CKM. The basic premise of the chapter is that



business organizations need to strive to adapt to opportunities as well as challenges brought by constant, complex, rapid, and discontinuous environmental changes.

Section I of Chapter II discusses basic concepts related to organizational environments and the relationship between organizations and their environments. It identifies and explains major types of environments (the general and the task environments), typologies of environmental changes, organizational change programs, and the relationship between environments and organizational effectiveness. Section II of Chapter II addresses the major issues that surround environmental conditions and organizational responses to their environments.

Section II – Reinventing – It looks into changes in the role of three major organizational pillars or enablers of CKM (3 Rs): reorganizing people, retooling ICT systems, and redesigning processes. It is composed by chapter III, IV, and V.

Chapter III looks into the reorganization of people in teams as a major pillar of CKM. Chapter IV examines the role of ICTs in retooling legacy systems in order to enable CKM change strategy. The main focus of this chapter is on the hardware, software, and network components of ICTs. Chapter V explores the last section in infrastructural changes, viz. the role of business processes in CKM change. Section I provides a theoretical background to the redesign of business processes. It examines the need for business process orientation, the anatomy of a process, the concept of BPR, pillars of BPR, principles of BPR, results of BPR, followed by a BPR example from the banking industry. This chapter discusses the strategic importance of process change and innovation in adapting to complex, dynamic and competitive business environments by leveraging process-based DCCs of organizations.

Section III – Capitalizing – This analyzes the first three stages of CKM value chain (3 Cs): capturing data from customers, compiling profiles of customers, and creating knowledge about customers. It is composed of chapters VI, VII, and VIII.

Chapter VI examines the concepts, issues, and trends related to capturing customer data and routing it to, or sharing it with, people in other units within the organization. Chapter VII discusses the strategic, or analytical side of CKM. This chapter focuses on the information discovery tools. Chapter VIII seeks to discuss various concepts, issues, and trends concerning composition of knowledge about customers.

Section IV – Mastering – This section includes the last three stages of CKM value chain (3 Ms): maximizing value for customers, managing relationships with customers, and managing learning throughout CKM change. It is composed by chapters IX, X and XI.

Chapter IX discusses the efforts to improve the experience of customers and to boost customer satisfaction and loyalty if businesses fail to connect with customers and anticipate their needs. Chapter X addresses customer value reciprocity for business represented by durable and profitable customer relationship. Chapter XI is concerned with learning and adapting throughout the life of CKM change. It focuses

on the accumulated knowledge and experience in CKM implementation, wherein end product learning is back channeled into the early planning stages of CKM.

## POTENTIAL AUDIENCE

The book is of immediate interest to academics and practitioners alike. It targets both advanced students and business managers'. This holistic view of the book could be useful for CRM professionals drill-down for CKM.

## CONTRIBUTION OF THE BOOK

The review of the conceptual foundations of BPR, ICTs, KM, and CRM shows that there is no shortage in the number of contributions devoted to the exploration of each concept. However, this book seeks to add value to existing literature by offering a one integrated enterprise-wide CKM paradigm that cuts-across traditional business silos to generate CK. The book provides a holistic approach for an inherently interdisciplinary subject matter. Different perspectives, frameworks, methods, techniques, models, and systems have been integrated into a unified CKM framework that tells a coherent story. Concepts, issues, and recommended solutions are described, explained, and illustrated using first-hand diagram and metaphors. In particular, two recommended solutions have identified new dimensions of CKM for mass customization and for customer life cycle that are unique to the existing models and theories of CKM.

This book presents a new conceptual framework that provides a holistic view of CKM. The book discusses and analyzes the approaches concerning CK and proposes CKM as a “multiple-paradigms one-solution” holistic business framework. The book introduces a strategic full-fledged multi-faceted, customer-oriented, and knowledge-intensive integrated framework to enterprise-wide business change. This framework is the basis of the organization of the book as it helps in organizing thoughts related to building blocks of several interdisciplinary subjects and identifying the interacting relationships between these building blocks. The CKM framework can also be used as a blue-print for CKM implementation.

The framework weaves together the various stages of CKM strategic change in a simple and practical framework. The unified framework helps readers to understand key CKM fundamental concepts (related to the “*What*, *Who*, and *Where*” questions), and interpret and analyze the reasoning behind initiating a CKM change strategy (related to the “*Why*” question), as well as CKM implementation (related to the “*How*” question).

The book introduces a comprehensive, yet simple and integrated approach to analyze and build CKM synergy from DCCs in key organizational elements: strategy, people, structure, processes, technology, and information in a way that advances the cause of system thinking in search of SCA. It also emphasizes the importance of strategic alignment *with* external environment, *among* organizational components, and *within* organizational components.

In each chapter, before the discussion of issues, a presentation of the most relevant concepts regarding the topic under discussion is conducted. The adopted framework provides continuity for the concept of CKM throughout the whole book. Each chapter starts with a scheme, that was presented in the preface, and that accompanies the reader throughout the book, telling him/her where he/she is and to where he/she is going and what still misses to be discussed. This scheme helps the reader navigate through the manuscript. The chapters are well integrated with each other; every chapter provides a foundation for understanding subsequent chapters, and subsequent chapters are interwoven with preceding chapters.

## REFERENCES

- Al-Shammari, M. (2005). Implementing a knowledge-enabled CRM strategy in a large company: A Case study from a developing country. In M. E. Jennex (Ed.), *Case studies in knowledge management* (pp. 249-278). Hershey, PA: Idea Group Publishing.
- Baker, M. (2000) Creating an alliance between employees and customers. *Knowledge Management Review*, 3(5), 10-11.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Bueren, A., Schierholz, R., Kolbe, L. M., & Brenner, W. (2005). Improving performance of customer-processes with knowledge management. *Business Process Management Journal*, 11(5), 573-588.
- Chen, Y-H., & Su., C-T. (2006). A Kano-CKM model for customer knowledge discovery. *Total Quality Management*, 17(5), 589-608.
- Cook, S. D. N., & Brown, J. S. (1999). Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. *Organization Science*, 10(4), 381-400.
- Davenport, T. H., & Klahr, P. (1998) Managing customer knowledge. *California Management Review*, 40(3), 195-208.

- Davenport, T. H., & Prusak, L. (1998). *Working Knowledge: How Organizations Manage What They Know*. Harvard Business School Press, Boston, MA.
- Davenport, T. H., Harris, J. G., & Kohli, A. K. (2001). How do they know their customers so well? *Sloan Management Review*, 42(2), 63-73.
- Desouza, K. C., & Awazu, Y. (2005). What do they Know? *Business Strategy Review*, 16(1), 41-45.
- Drucker, P. F. (1999). Knowledge worker productivity – the biggest challenge. *California Management Review*, 41(2), 79-94.
- Garcia-Murilo, M., & Annabi, H. (2002). Customer knowledge management. *Journal of the Operational Research Society*, 53, 875-884.
- Gibbert, M., Leibold, M., & Probst, G. (2002). Five styles of customer knowledge management and how smart companies use them to create value. *European Management Journal*, 20(5), 459-469.
- Inkpen, A. C. (1996). Creating knowledge through collaboration. *California Management Review*, 39(1), 123-139.
- Kolbe, L., et al. (Eds). (2003). *Customer knowledge management*. Berlin: Springer.
- Lopez-Nicolas, C., & Molina-Castillo F. J. (2008). Customer Knowledge Management and E-commerce: The role of customer perceived risk. *International Journal of Information Management*, 28(2), 102-113.
- Österle, H. (2001), Enterprise in the information age, in H. Österle, E. Fleisch, & R. Alt (Eds), *Business Networking: Shaping Collaboration between Enterprises* (pp.17-54), Springer, Berlin.
- Paquette, S. (2005). Customer knowledge management. In D. Schwartz (Ed.), *The Encyclopedia of knowledge management* (pp. 90-96), Hershey, PA: Idea Group.
- Paquette, S. (2005a). Customer knowledge management. In D. Schwartz (Ed.), *The Encyclopedia of knowledge management* (pp. 90-96), Hershey, PA: Idea Group.
- Paquette, S. (2005b). The impact of customer-centric knowledge management systems on strategic decision-making. *AMCIS 2005 Proceedings*. Paper 366.
- Prahalad, C., & Ramaswamy, V. (2000). Co-opting customer competence. *Harvard Business Review*, 78(1), 79-87.
- Romano, N. C., & Fjermestad, J. (2002). Electronic commerce customer relationship management: an assessment of research. *International Journal of Electronic Commerce*, 6(2), 61-113.

Rowley, J. (2002a). Eight questions for customer knowledge management in E-Business. *Journal of Knowledge Management*, 6(5), 500-511.

Rowley, J. (2002b). Reflections on customer knowledge management in E-Business, *Qualitative Market Research*, 5(4), 268-280.

Smith, H. A., & McKeen, J. D. (2005). Developments in Practice XVIII - Customer Knowledge Management: Adding Value for Our Customers. *Communications of the Association for Information Systems*, 16, 744-755.

Su, C-T., Chen, Y-H., & Sha, D. Y. (2006) Linking innovative product development with customer knowledge: a data-mining approach. *Technovation*, 26(7), 784-795.