

# An Integrated Process-based Customer Knowledge Management Model

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## ABSTRACT:

To address the lack of an integrated and comprehensive framework in the context of CKM, the study follows a process-oriented approach to construct an integrated process-based customer knowledge management model, which describes the business processes relevant to CRM and KM initiatives. The model is the result of integrated research combining theoretical conceptualization efforts with practical application. Furthermore, the study discusses the CKM process model, and offers a process perspective to illustrate which KM tools can be applied to the CRM sub-processes to achieve effective CKM. It introduces the four KM aspects content, competence, collaboration and composition. This model may serve as a guideline for practitioners and thereby help to alleviate the gap between the benefits known from theory and case studies and a very broad CRM process implementation. The model provides a theoretical frame of reference to achieve the purpose of the study. These CKM process are repeated, aiming to conceptual framework continuously enhance and update the quality and quantity of the organizations customer knowledge and to maximize the advantages that this knowledge provides. The study constructs an integrated process-based customer knowledge management model from four stages of CKM process—IACE, via the combination of both the technology-driven and data oriented approaches in CRM and the people-oriented approach in KM could achieve a managerial framework for knowledge-based CRM strategy, processes, systems and change management, finally to reach synergy potential and a target marketing-oriented CKM model to satisfy customers' needs and desires or to solve a specific problem.

*Keywords: Customer knowledge management, CKM, CRM, Process-based model*

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## 1. Introduction

In general, two core developments can be identified which finally led to the emergence of CRM. One of these developments was the shift from a focus on transactions to the establishment, marketing and nurturing of relationships with customers (Bose and Sugumaran, 2003). Companies that pursue a CRM approach focus on customer retention rather than on single sales (Webster, 1992). Formally, relationship marketing can be characterised as an integrated effort to identify, maintain, and build a network with individual customers, and the strengthening of this network for both sides' mutual benefit (Shani and Chalasani, 1992). Due to the different influences leading to the development of the CRM concept, there are also many divergent perspectives on CRM. The different dimensions have been widely discussed by marketing practitioners and scholars alike (e.g., Massey et al, 2001; Zablah et al, 2004).

The CRM discipline's relationship with KM approaches and technologies has widely been recognized as a relevant field of research (Winer, 2001; Massey et al., 2001). As CRM processes can be considered semi-structured or even unstructured, they reveal a high complexity as well as a strong knowledge intensity. Since collecting, storing and distributing relevant knowledge for those CRM processes makes the deployment of KM techniques necessary, it is evident that an organisation's KM capabilities play a key role in CRM success (Croteau and Li, 2003). In this context, KM can be defined as "the process of critically managing knowledge to meet existing needs, to identify and exploit existing and acquired knowledge assets and to develop new opportunities." (Quintas et al, 1997) Likewise, CKM can be defined as the systematic handling and management of knowledge collected at customer interaction points which is required for the efficient and effective support of business processes (Geib and Riempp, 2002).

As a further concretisation of this notion, the study distinguishes three kinds of knowledge flows that play a vital role in the interaction between an organization and its customers: knowledge for, from and about customers. Firstly, in order to support customers in their buying cycle, a continuous knowledge flow directed from the company to its customers (i.e. knowledge for customers) is a prerequisite (Davenport and Klahr, 1998). Knowledge for customers comprises information about products, markets and suppliers (Garcia-Murillo and Annabi, 2002) and is primarily addressed by CRM service processes. This knowledge dimension also impacts the customer's perception of the service quality - which has been identified as an important determinant of satisfactory financial performance (Taylor and Baker, 1994). At the same time, knowledge from customers has to be incorporated by the company for product and service innovation, idea generation as well as for the continuous improvement of its products and services (Thomke and von Hippel, 2002; Chesbrough, 2003). Capturing customer knowledge and involving customers in the innovation process can be achieved in various ways (Gibbert et al., 2002). For example, customers' knowledge about products, suppliers and market trends can be used via appropriate feedback mechanisms to enable a systematic

improvement and innovation of products (Garcia-Murillo and Annabi, 2002; Gibbert et al., 2002). The collection and analysis of knowledge about customers is certainly one of the oldest forms of KM activity in the CRM domain (Reichheld and Scheffer, 2000). Besides the customer's master data and past transactions, knowledge about the customer encompasses the customer's present needs and requirements, future desires, connections, purchasing activity and financial capability (Davenport et al, 2001; Day, 2000). Knowledge about customers is collected in CRM service and support processes and analysed in CRM analysis processes.

Davenport et al. (2001) begin to argue that knowledge about the customer is only the first step, and organizations should create processes to better manage the relationships they discover with this information to create profitable interactions. The focus they present remains with learning about the customers needs through different channels. However, the customers involvement in the knowledge process is still passive, and not participatory (Paquette, 2006), CKM gives an emphasis on customers as partners in the knowledge creation process. Customers co-create knowledge with an organization in order to create value for both parties by sharing knowledge residing within customers in order to create better products. Here, the two entities work together with a shared goal in mind, and the customer becomes an active and key participant in the knowledge creation process (Paquette, 2006).

The study follows a process-oriented approach, which define CRM as an interactive process achieving the optimum balance between corporate investments and the satisfaction of customer needs in order to generate the maximum profit. Many researchers have addressed the lack of an integrated and comprehensive framework in the context of CKM. Therefore, the study aims to deploy a process framework, which describes the business processes relevant to CRM and KM initiatives. The framework is the result of ongoing research combining theoretical conceptualization efforts with practical application.

## **2. Literature Review**

### **2.1. CKM With Process Aspects**

Rowley (2002) suggests that customer knowledge management is concerned with the management and exploitation of customer knowledge. According to to as Customer Knowledge Management (CKM). It is within these processes that an organization and its customers collectively work together to combine their existing knowledge to create new knowledge (Paquette, 2006). Accordingly, Gibbert et al. (2002) states that CKM is the strategic process by which companies emancipate their customers from passive recipients of products and services, to empowerment as knowledge partners. Many studies have used customer knowledge and customer information interchangeably, causing confusion between the two terms. One main theory states that understanding how each customer interacts with business processes is to gain knowledge about that customer. Other authors would describe this only as customer information, as it is knowledge about the customer and is gained without a predetermined close interaction or partnership. Some of them also examine the use of customer information within a retail environment, and look at how data mining can contribute to an organizations understanding of the customer. Once again, the emphasis is on acquiring information about the customer, without interaction or joint knowledge creation. (Paquette, 2006)

While KM attempts to solve the axiom "if only we knew what we know," CKM attempts to solve the axiom "if only we knew what they know," referring to information a customer knows about a business, its competitors, and the marketplace.

### **2.2. The Technology-Driven And Data Oriented Approaches In CRM And The People-Oriented Approach In KM**

CKM is comprised of multifaceted business functions, and could include an optimal mix of marketing, marketing research, marketing information systems, customer profiling, customer analytics, competitive intelligence, business intelligence, and customer relationship management. Data and information is gathered at the individual customer level, the market segment level and at the level of the business's overall customer profile, then processed and converted into customer knowledge to fuel organizational learning and change organizational behavior. Effective CKM requires active customer involvement in the company's decision-making: learning from customers and understanding their knowledge and product needs by identifying, sorting, and differentiating relative knowledge between customer expectation and customer competence: what customers want and what is critical to their decision-making.

Challenges to CKM include capture and codification, translating and transferring tacit knowledge into to explicit knowledge, developing coherent internal KM strategy and resource coordination between a myriad of different business processes, multiple environments, platforms and systems, keeping knowledge current and up-to-date, changing organizational culture, determining how much knowledge to share with customers, customer education, communication to and from customers, as often customers can't articulate their needs and wants, and data and information is by nature situational, behavioral, and psychological. As is being discussed above, customer knowledge management (CKM) model has drawn much attention by the combination of both the technology-driven

and data oriented approaches in CRM and the people-oriented approach in KM, with a view to exploit their synergy potential. The expectation from this endeavour is to more articulately delineate knowledge for customers, knowledge about customers, and knowledge from customers, so that more beneficial products can be delivered to the right group of customers, to prevent product failure and to ensure commercial success. (Su et al., 2006)

### 2.3. e-CKM Model

With this background and the objective of addressing the essentiality of customer knowledge in innovative new product development (NPD), Su et al.(2006) presents a methodology to support the argument that in order to ensure business excellence, a products features must meet the needs of specific customer groups in the market. This is accomplished by a target marketing-oriented customer knowledge management-model implemented by information technology, which is named E-CKM model (figure 1).

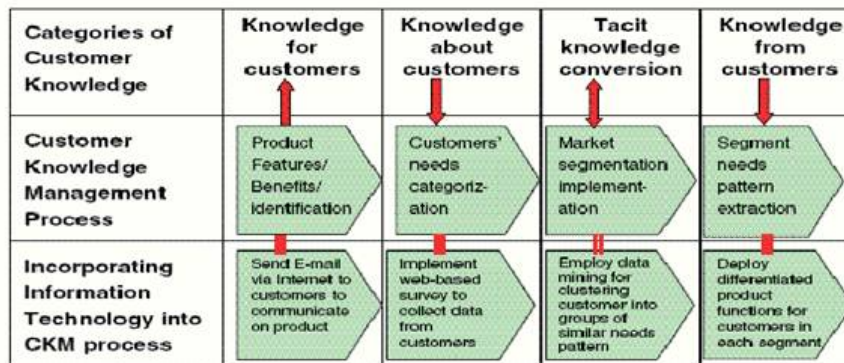


Figure 1: The E-CKM Model (Su et al., 2006)

In the E-CKM model described in the following figure 1, the CKM process comprises four stages which are supported by the applications of different methods in information technology. At the first stage, the company identifies perspective product benefits in terms of a customers perceived value, in the form of features, functions, and other attributes which can be communicated to the customers.

At this stage, the company delivers product knowledge for the customers. Individual customers may make response based on their own attitudes toward these features or benefits, via a bi-directional communication channels. Moreover, at the second stage, the company acquires knowledge about the customers by understanding the customers background, needs, and preference pattern toward product features (Su et al., 2006). Through that communication and a web-based survey, a company is able to utilize knowledge for customers and knowledge about customers, and conduct the appropriate market segmentation task. After the segments are formed through data mining, each segments pattern of needs towards product features is well delineated. Now the different characteristics of each segment can be identified and analysed. At this (third) stage the tacit customer knowledge, dispersed among the individual customers is excavated, and it can be codified into explicit customer knowledge desired by the company.

Finally, once the segmentation task is completed, the characteristics of the customers needs in each segment are studied in order to extract the needs patterns in each segment. Therefore, the knowledge from customers enables the company to aim at the right target market segments. It also enables them to make the appropriate strategic business decisions in the product variant development plan and marketing activities. It helps the company to revise the original definition of the product, set priorities for product attributes to be developed, enhance the functionality of the attractive product elements, and rule out product features in which the customers show no interest. And this is the way the company can innovate or improve the product with the utilization of the knowledge from the customer.

### 2.4. CRM Process Model

Salomann et al, (2005) adopted the proposed structure in respect of the topic of how CRM processes are enhanced by KM initiatives. The questions can be summarised as follows:

- CKM challenges: In which respect is knowledge for, from, or about your customers needed to improve your products and services?
- Knowledge impact: Which approach to managing customer knowledge did you employ to improve your products and services?

- Performance outcome: What are the tangible and intangible results of knowledge-based CRM at your company?
- To clarify and elaborate on the case descriptions, they were reconciled with the interview partners, and sometimes required further interviews.

For the research purposes, Salomann et al., (2005) follow a process-oriented approach by Shaw and Reed (Shaw and Reed, 1999), who define CRM as an interactive process achieving the optimum balance between corporate investments and the satisfaction of customer needs in order to generate the maximum profit. Many researchers have addressed the lack of an integrated and comprehensive framework in the context of CKM (e.g. Bose and Sugumaran, 2003; Winer, 2001; Massey et al., 2001). For the purposes, Salomann et al., (2005) deployed a process framework which describes the business processes relevant to CRM and KM initiatives. The framework is the result of ongoing research combining theoretical conceptualization efforts with practical application.

The theoretical findings elaborate on eight years of case study and action research that have been introduced to the research community (for further discussion see Gebert et al., 2003; Geib et al., 2005; Bueren et al., 2005; Geib et al., 2004; Gebert et al., 2003). Additionally, in collaboration with research partners, the research results have been discussed and validated in practice. The framework comprises all identified business processes that are relevant to successful CRM implementation within an organization. An important characteristic of the framework is that it is geared towards customers' needs and desires. Ives and Learmonth apply the concept of the customer resource lifecycle (CRLC) in order to fulfill these needs (Ives and Learmonth, 1984, p. 1197). Österle similarly refers to the concept of the customer process (Österle, 2003, p. 25) which is a sequence of activities performed by a customer in order to satisfy a need or to solve a specific problem. The process framework differentiates between four types of processes which are explained in the following (Table 1).

**Table 1: A CRM Process Framework (Gebert et al., 2003)**

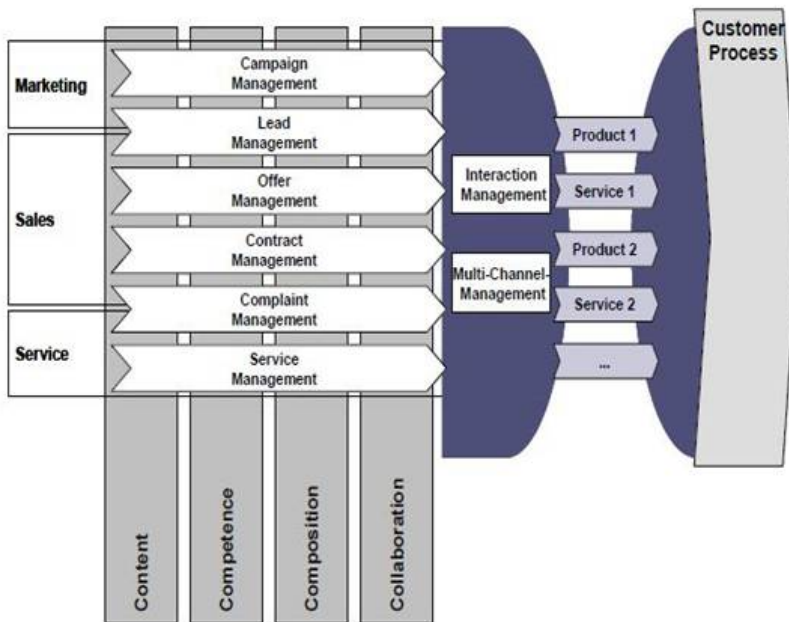
| Processes                     | Contents  |
|-------------------------------|---|
| <b>CRM Service Processes</b>  | This type of process consists of sub-processes with direct customer interaction designed for a complete coverage of the customer process. The following processes can be distinguished: Campaign management: it is the core marketing process, which puts the ideas of relationship marketing into practice. It can be defined as planning, realization and controlling of marketing activities directed at already known recipients. Usually, marketing campaigns are individualized or aim at specific segments by means of different communication channels. Therefore, campaign management covers the need articulation phase of the customer process. Sales management: The aims of sales management are to find out the needs of potential or existing customers as comprehensive as possible, to advice the customer on possible alternatives for the satisfaction of the identified needs, to provide the customer with an offer, and to close a contract as the final step. Sales management addresses the need articulation, evaluation and buying phases of the customer process. Service management: it can be referred to as planning, realization and controlling of services offered in the after-sales phase. Service management corresponds with customer process phases of using and disposal. Complaint management: it is about receiving, processing and communicating the dissatisfaction articulated by the customer throughout the customer process. Complaint management is primarily concerned with the using phase of the customer process. |
| <b>CRM Support Processes</b>  | These are processes with direct customer interaction which are not designed for a complete coverage of the customer process, but for performing support tasks in the context of CRM. In the context of this process type, two support processes can be identified: Loyalty management, also known as customer retention management, can be defined as the planning, realization and controlling of measures, which aim at the optimization of the duration and intensity of customer relationships. The main focus of market research is the systematic design, collection, analysis and reporting of data and results relevant for a specific marketing situation.   |
| <b>CRM Analysis Processes</b> | These processes consolidate and analyze knowledge collected in other CRM processes. The results of the analysis will be handed over to other CRM processes as well as service innovation and creation processes in order to improve their efficiency. As opposed to the management of leads, customer scoring aims at generating a shortlist of existing customers, which seem to be suitable for the offering of certain services or products. The goals are to exploit cross-selling potentials, to reduce contact costs and to increase customer satisfaction. Lead management comprises the consolidation, qualification and prioritization of contacts to potential customers. Customer profiling is concerned with the analysis of available knowledge about customers in order to classify and characterize each customer individually. As opposed to customer profiling, customer segmentation  |

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|                                 | deals with the clustering of homogenous customer groups, which have similar needs and requirements. Feedback and knowledge management are responsible for collecting and analyzing knowledge from the customer, which can be used for the improvement of products and services as well as processes within a company.  |
| <b>CRM Management Processes</b> | These processes comprise all entrepreneurial management tasks for design, control and development of CRM service, support and analysis processes. In detail, the processes are as follows: Multi-channel management comprises the integrated and coordinated development, design and control of product and knowledge flows to as well as from customers through different media and channels. Performance Management is the control process of all CRM processes described above. It enables an integrated control and allocation of resources. |

Marketing concepts suggests a firm must find a way to discover unfulfilled customer needs and bring to market products and services that satisfy those needs. As there is no well-accepted marketing process today, a commonly accepted process for performing marketing is difficult. Further more, some argue that marketing has never been viewed, managed or taught as a process. It has always been viewed, managed and taught in pieces; and, in practice, it has been treated as an art form for which, at best, a company can provide a suitable climate for gifted people. The situation is analyzed to identify opportunities, the strategy is formulated for a value proposition, tactical decisions are made, the plan is implemented and the results are monitored (Business Knowledge Center, 2008). However, Gooze and Mroz (2007) argue that marketing can be conceived as a system that integrates four main elements, as presented below:

1. Environmental Influences are those factors that occur in the external world that can monitor, analyze and predict - but not control.
2. Value specification is the process of understanding and agreeing upon who buys and what they are buying from you ... or what they want to buy that they can't buy from others.
3. Solution Development is composed of the set of marketing activities that focus on actually creating the completed solution bring to market. In Solution Development, marketing department works closely with product development function throughout the product/service development cycle.
4. Customer Development is the customer-facing side of marketing/sales. It consists of creating demand for product and fulfilling that demand.

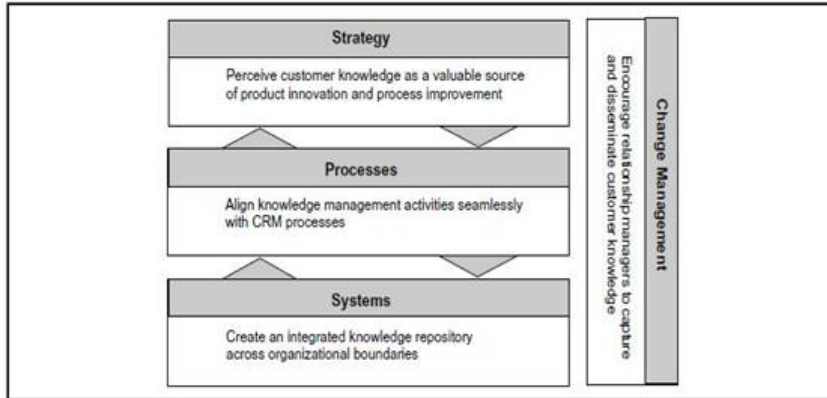
The marketing process view provides a different perspective to look at the CKM process since CKM is about what and how to manage customer knowledge. In CKM, KM plays the role of a service provider managing the four knowledge aspects: contents, competence, collaboration and composition. The CKM process model as introduced by Gebert et al. (2003) offers a process perspective to illustrate which KM tools can be applied to the CRM sub-processes to achieve effective CKM. It introduces the four KM aspects: content, competence, collaboration and composition (Figure 2).



**Figure 2: CKM Process Model (Gebert Et AL., 2003)**

**2.5. A Managerial Framework For Knowledge-Based CRM**

Based on the findings by Salomann et al., (2005), they present four implications of the successful improvement of CRM processes by KM. According to the business engineering concept, these implications can be arranged in a managerial framework for knowledge-based CRM strategy, processes, systems and change management (see Figure 3). The business engineering concept enables the transformation of enterprises from the industrial age into the information age by means of procedure models, methods, and tools (Osterle, 1995).



**Figure 3: A Managerial Framework For Knowledge-Based CRM (Salomann Et AL., 2005)**

This framework may serve as a guideline for practitioners and thereby help to alleviate the gap between the benefits known from theory and case studies and a still very low level of broad CRM process implementation that they identified in this study’s survey. The elements of the proposed framework can be outlined as table 2.

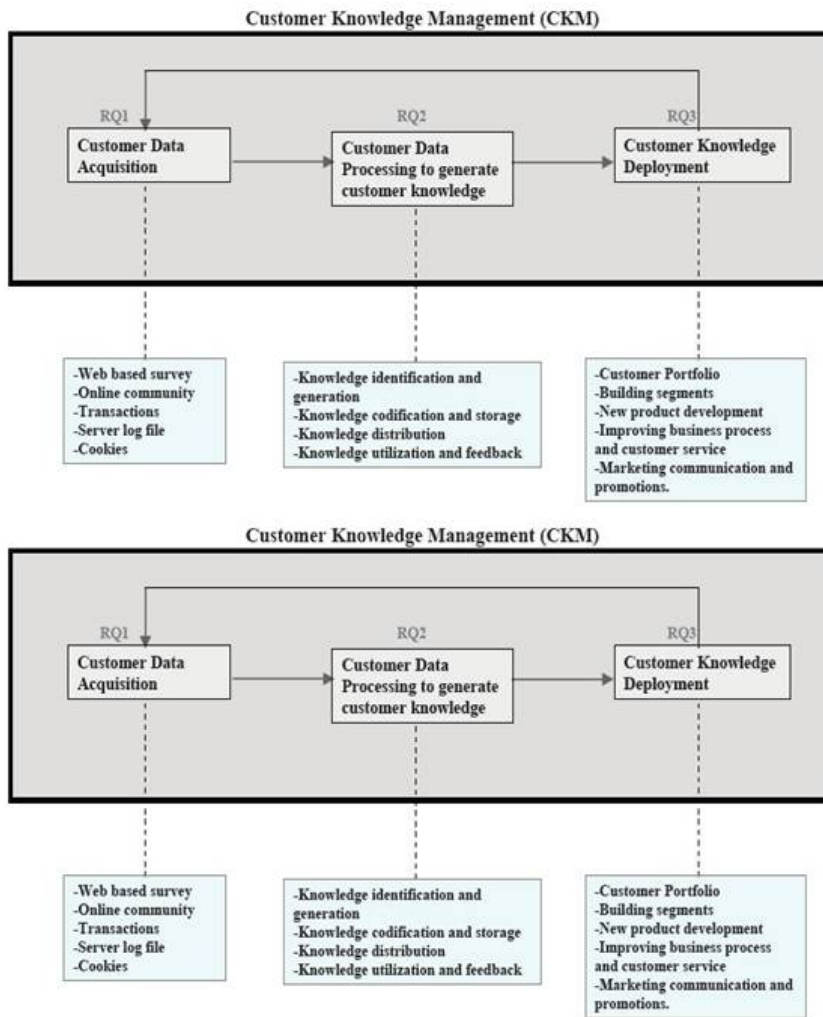
**Table 2. The Elements Of The Proposed Framework Can Be Outlined Source: Salomann et al., (2005)**

| Elements  | Contents  |
|-----------|---|
| Strategy  | <b>Perceive Customer Knowledge as a Valuable Source of Product Innovation and Process Improvement:</b> In order to harness the potential of CKM processes and their support by adequate systems use, top management has to recognise their customers as a valuable source of knowledge rather than a burden. At Siemens Mobile, this perception formed the basis of an organisational connection between customer care and product development in order to access incoming customer ideas and suggestions for product innovation and service improvement. |
| Processes | <b>Align KM Activities Seamlessly with CRM Processes:</b> As the Union Investment case showed, CRM processes are best enabled by customer knowledge if the supportive KM processes are lean and tightly integrated into a relationship manager’s actual work. At Union Investment, the effort to support the customer contact center with relevant knowledge could be reduced significantly. The issue of KM as a separate task thus loses prominence. Various authors, like Davenport and Glaser, support this view by arguing that                      |

|                      |   |
|----------------------|---|
|                      | the best way of managing knowledge effectively is to integrate it “invisibly” into the actual core processes (Davenport and Glaser, 2002).  |
| 1.1.1.1.1<br>Systems | <b>Create an Integrated Knowledge Repository across Organisational Boundaries:</b> An integrated view of the relevant customer data as well as an integration of the relevant systems has been a critical success factor in all the three cases we described. As the Siemens case showed, a centralized knowledge repository helped to overcome both regional boundaries and separations between business units. The data warehouse was also an imperative prerequisite for Credit Suisse to establish criteria for the evaluation of customer value and marketing campaigns across several product groups. |

## 2.6. Emerged Frame Of Reference

Based on the relevant selected literature, a frame of reference has emerged. This emerged frame of reference (Figure 4) will provide a guideline for the data collection process and it has been developed in order to reveal how research questions are related to each other. It, also, defines the way data will be collected and provides a theoretical frame of reference to achieve the purpose of the study.



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1. The company identifies perspective product benefits in terms of a customers perceived value, in the form of features, functions, and other attributes which can be communicated to the customers.
2. The company acquires knowledge about the customers by understanding the customers background, needs, and preference pattern toward product features.
3. The tacit customer knowledge, dispersed among the individual customers is excavated, and it can be codified into explicit customer knowledge desired by the company.

4. Once the segmentation task is completed, the characteristics of the customers needs in each segment are studied in order to extract the needs patterns in each segment.

Customer knowledge management (CKM) model has drawn much attention by the combination of both the technology-driven and data oriented approaches in CRM and the people-oriented approach in KM.

The technology-driven and data oriented approaches in CRM: customer data acquisition, customer data processing to generate customer knowledge, customer knowledge deployment to generate value. CKM is a continuous process which consists of several steps:

- I. The data acquisition procedure, where the customer data is collected from different communication avenues and contact points with the customers.
- II. The collected data is being processed in order to transform them into useful information and knowledge for the organization.
- III. This customer knowledge is being deployed in several ways in order to generate value for the organization and its customers.

These three steps of the CKM process are repeated, aiming to conceptual framework continuously enhance and update the quality and quantity of the organizations customer knowledge and to maximize the advantages that this knowledge provides.

The people-oriented approach in KM: the process framework differentiates between four types of processes which are explained in the following:

- CRM Service Processes
- CRM Support Processes
- CRM Analysis Processes
- CRM Management Processes

The framework comprises all identified business processes that are relevant to successful CRM implementation within an organization. The CKM process model offers a process perspective to illustrate which KM tools can be applied to the CRM sub-processes to achieve effective CKM. It introduces the four KM aspects: content, competence, collaboration and composition.

The combination of both the technology-driven and data oriented approaches in CRM and the people-oriented approach in KM could achieve a managerial framework for knowledge-based CRM strategy, processes, systems and change management, the elements of the proposed framework can be outlined as follows:

Strategy – perceive customer knowledge as a valuable source of product innovation and process improvement.

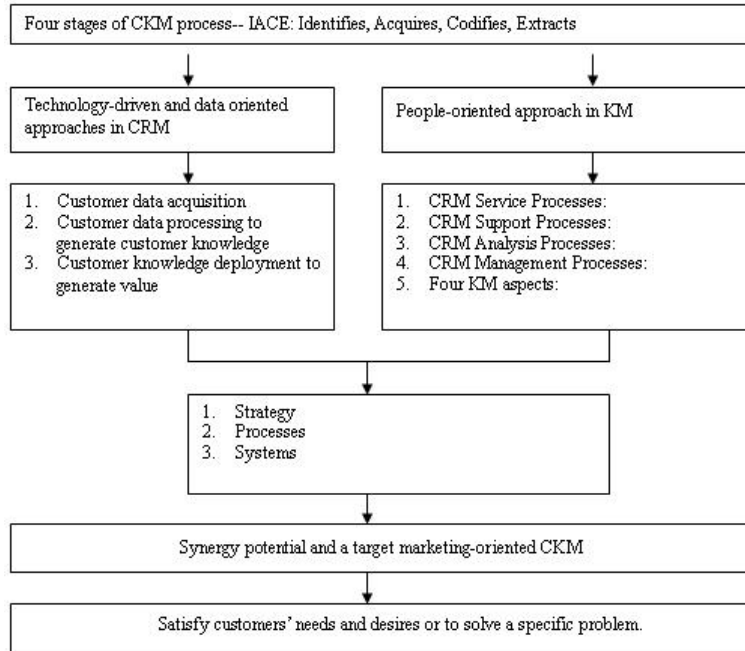
Processes – align KM activities seamlessly with CRM processes.

Systems – create an integrated knowledge repository across organisational boundaries.

With a view to exploit their synergy potential, and a target marketing-oriented customer knowledge management-model implemented by information technology.

The model deployed a process framework which describes the business processes relevant to CRM and KM initiatives. The framework comprises all identified business processes that are relevant to successful CRM implementation within an organization. An important characteristic of the framework is that it is geared towards customers' needs and desires, apply the concept of the customer resource lifecycle (CRLC) in order to fulfill these needs. The customer process is a sequence of activities performed by a customer in order to satisfy a need or to solve a specific problem.





**Figure 5: An integrated Process-based Customer knowledge Management model**

#### 4. Conclusions

For the research purposes, the study follows a process-oriented approach, which define CRM as an interactive process achieving the optimum balance between corporate investments and the satisfaction of customer needs in order to generate the maximum profit. Many researchers have addressed the lack of an integrated and comprehensive framework in the context of CKM, hence, the study aims to deploy a process-based model, which describes the business processes relevant to CRM and KM initiatives. The model is the result of integrated research combining theoretical conceptualization efforts with practical application.

The process-based CKM model combines both the technology-driven and data oriented approaches in CRM and the people-oriented approach in KM could achieve a managerial framework for knowledge-based CRM strategy, processes, systems and change management. The people-oriented approach in KM includes four types of processes: 1.CRM service processes: campaign management, sales management, service management, complaint management 2.CRM support processes: loyalty management, market research is the systematic design, collection, analysis and reporting of data and results. 3.CRM analysis processes: lead management, customer profiling, customer segmentation, feedback and knowledge management. 4.CRM management processes: multi-channel management, performance Management. The model offers a process perspective to illustrate which KM tools can be applied to the CRM sub-processes to achieve effective CKM. It introduces the four KM aspects content, competence, collaboration and composition.

The study discusses four implications of the successful improvement of CRM processes by KM. According to the business engineering concept, these implications can be arranged in a managerial framework for knowledge-based CRM strategy, processes, systems and change management.

In summary, the study constructs an integrated process-based customer knowledge management model fro four stages of CKM process—IACE, via the combination of both the technology-driven and data oriented approaches in CRM and the people-oriented approach in KM could achieve a managerial framework for knowledge-based CRM strategy, processes, systems and change management, finally to reach synergy potential and a target marketing-oriented CKM model to satisfy customers' needs and desires or to solve a specific problem.

Finally, this model may serve as a guideline for practitioners and thereby help to alleviate the gap between the benefits known from theory and case studies and a very broad CRM process implementation. Also, this model will provide a guideline for providing a theoretical frame of reference to achieve the purpose of the study. These CKM process are repeated, aiming to conceptual framework continuously enhance and update the quality and quantity of the organizations customer knowledge and to maximize the advantages that this knowledge provides.

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