Implementation of Knowledge Management on Customer Relationship Management System, A Literature Review

Adi Widiantono[1(✉)] and Puteri Sejati[2]

[1] Informatics, Esa Unggul University, Jakarta, Indonesia
adi.widiantono@esaunggul.ac.id
[2] Magister Computer Science, Esa Unggul University, Jakarta, Indonesia

Abstract. Currently the value of a customer (customer's value) is very important in a business competition. For this reason, they continuously improve customer relationships using Customer Relationship Management System (CRM). The implementation of Knowledge Management (KM) can improve the quality of information generated through CRM system. This paper is studied how far the implementation of KM on CRM system has occurred and its impact. What is Customer Knowledge Management (CKM) as a result? Using the Literature Review method and several comparisons to produce an understanding of the application of KM on CRM system, and then use as reference for case study implementing KM on CRM.

Keywords: Knowledge Management · Customer Relationship Management · Customer Knowledge Management · KM · CRM · CKM

1 Introduction

In today's business in maintaining revenue, organizations are looking for ways to retain customers, increase customers, profits and growth. Since the cost of acquiring new customers is almost five times greater than the cost of retaining existing ones, the organizations are trying to develop customer relationship management (CRM) strategies [2].

Many organizations have developed and implemented CRM initiatives as an effort to learn better about customers and develop relationships with them to increasing customer satisfaction and loyalty. Capturing and managing customer data and turn this data into valuable and shareable customer knowledge properly, can used to improve and customize product and service offerings to customers. However, CRM basically cannot fully meet these needs [2]. Therefore, managing knowledge about customers has become one of the prerogatives for organizations to survive. Using Knowledge Management (KM), managing knowledge about customers can be carried out and provide added value to the value of information to these customers [3]. An organization that has focused on customer knowledge requires quite extensive knowledge. A customer-focused company must provide the knowledge that customers demand, cultivate the knowledge provided and have

knowledge of the customer itself. As a result, knowledge is considered an important and critical resource in this 21st century competition. Embedding this knowledge to support business processes is the task of KM [4]. With IT technology, the application of KM in CRM becomes a strong collaboration to improve organizational competitiveness.

This paper aims to study the application/implementation of KM in CRM system or the collaboration between the two in an organization and the resulting impact. The expected result is an understanding how KM implemented in a CRM system and the processes that need to be taken. CKM, whether it is a strategy or a process that is formed from the application of KM in CRM, will be discussed.

2 Background

2.1 Customer Relationship Management (CRM)

The origins of CRM can be traced back to the concept of Marketing Relationship (RM) management which is a concerted effort to identify, build, and maintain networks with individual customers for the mutual benefit of both parties [1, 4]. Information technology (IT) have greatly influenced the advancement of CRM, bridge the veiled approach to customer relationships, create a holistic view of the customer as an enterprise or from all lines in the company's services. CRM is used to view customer relationships as an investment, which makes an important contribution to the company and is designed to strengthen a company's competitive position by increasing customer loyalty.

With IT contribution, currently CRM is a modern tool to analyze customer information from various data sources such as the internet, shops, activity/marketing centers, exhibitions and others. If CRM is designed and implemented properly, customer identification can become a reality. More deeply, the CRM strategy is based on 4 (four) main things [1], are:

- Captivate customers of other companies at the time of first purchase
- Encourage the first customer to make the next purchase
- Keeping customers while being loyal customers
- Provide proper service to loyal customers.

CRM allows managers to use customer information as data to increase their production, and increase long-term profits.

2.2 Knowledge Management (KM)

KM in business is a discipline used to [2]:

- identify and capture knowledge;
- encourage knowledge sharing between individuals;
- use existing knowledge to create new knowledge; and
- use knowledge to define and improve enterprise.

KM is a way of treating knowledge like an asset that can be treated as something that is used, maintained and utilized for the benefit of the organization.

According to Allen (2000), KM and marketing intersect when businesses use database technology to collect customer information, position products and services to serve profitable segments and to communicate with markets using integrated strategies and to measure results. Knowledge-based strategies help marketers to adapt their principles to new economic situations.

KM, with information technology, can turn a company's customer data into a source of competitive advantage. Customer data can be mined to reveal valuable customer knowledge related to purchasing behave, brand selection and product loyalty. This knowledge can be used to customize products and services according to individual customer needs and preferences and also to offer new products and services in response. This results in better and more profitable customer relationships [2].

KM enables customer data to be effectively transformed into valuable customer knowledge that can be stored, shared and appropriately used to enhance CRM within the organization.

3   Method

The author uses the Literature Study method as a basis for gaining knowledge as a reference for case studies. The steps can be described as follow (Fig. 1).

3.1   Articles Collection

In the literature study, the authors searched for sources using the Mendeley® tool in searching for literature in cyberspace.

Search Keywords. The keywords used are "Knowledge Management", "Customer Relationship Management", "Marketing", "Customer Service", "Marketing Knowledge
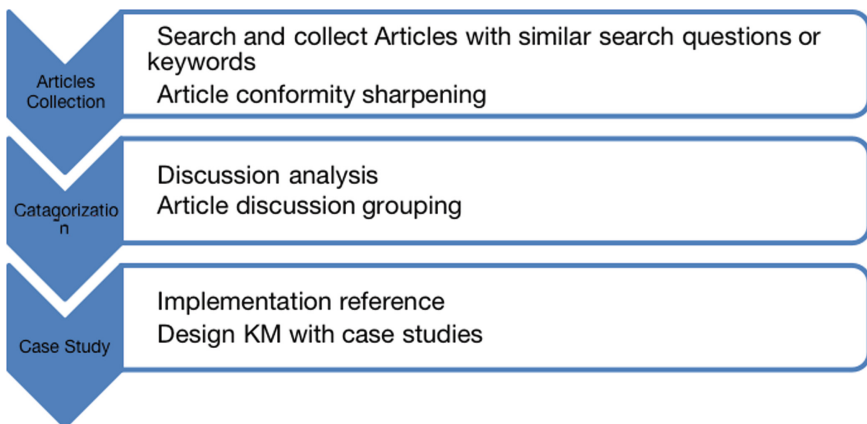

Articles Collection
Search and collect Articles with similar search questions or keywords
Article conformity sharpening

Catagorization
Discussion analysis
Article discussion grouping

Case Study
Implementation reference
Design KM with case studies

Fig. 1. Step of Methodology.

base", and "Customer Knowledge base". From the search results there are about 700 literature sources.

Conformity Articles. In accordance with the title of this article, the authors conducted a re-search with the following limitations:

- Titles related to KM
- There is a discussion of CRM and KM
- Not a discussion of Computer Applications/Software.

From the search results, 17 sources of literature are found that are closely related to the title and purpose of this article.

3.2 Analyzing and Categorization

The author makes a grouping of search results based on the output or ideas conveyed from the source. From this grouping, it is hoped that it can provide information about what research has taken place. Thus, information can be retrieved about the current application of KM in CRM.

3.3 Case Study

To understand more about the implementation of KM in the CRM system, a selection of references was made from articles that have been grouped with certain topics. This reference will serve as the basis for a case study for the design of KM in CRM.

4   Results and Discussion

4.1 Literature Study Analysis

A literature search using the above method yielded the following:

- Based on keywords, from the search results there are about 700 literature sources
- And the results of sharpening the suitability of the article by retracing from literature sources obtained 17 articles that are closely related to the title and purpose of this paper.

Furthermore, an analysis of the discussion in the article was carried out and the groupings were obtained which can be seen in Table 1.

4.2 Categorization

KM and CRM integration. One of the applications of KM in CRM is to integrate KM with CRM, from the integration it produces a process or need a stage to implement KM in CRM or in the form of an implementation strategy [5, 6, 12]. In other literature, the form of integration is KM as a supporter of CRM, so as to get optimal results

Table 1. Categorization/Grouping Result.

No	Category	Sources	Num
1	KM and CRM integration	[3, 5, 6, 8, 12]	5
2	CKM as an integration model	[1, 4, 10, 14, 16]	5
3	Analysis of KM success and the impact on CRM	[2, 7, 9, 11, 13, 15, 17]	7

in CRM management [3, 8]. This integration has the same goal, which is to provide maximum benefits for the organization or company from the management of knowledge from customer information in providing services or products that are appropriate and in accordance with needs. This makes the organization/company more superior and competitive in business competition.

CKM as an integration model. Customer Knowledge Management (CKM) is used as a model for KM integration in CRM. In some literatures apply the CKM model and analyze the results and stages carried out as a tool to improve CRM capabilities in an organization/company [1, 4, 10, 14, 16]. The ultimate goal of this CKM is to provide the right model and can be applied to support and increase the competitive level of the organization/ company.

Analysis of KM Success and Impact on CRM. From the integration model and the application of CKM, some literature analyzes or studies the impact of implementing KM on CRM with several existing models. The studies were conducted either through surveys or literature studies, all of which resulted in a positive impact [2, 7, 9, 13, 15, 17]. Some literature states that there is no standard measure to measure the success of the impact of this KM [11].

From the grouping above, the CKM model has characteristics with its own pattern in accordance with the fundamentals of Knowledge Management in accordance with its approach, this will be discussed further.

4.3   Case Study

1. Reference: Application of CKM in CRM

In some literatures, CKM is an integration of KM in business that focuses on handling consumers. In supporting this, CKM is categorized into three main knowledges [1, 10]:

- *Knowledge about Customers*, find out about the motivations and needs of consumers.
- Knowledge for Customer, provide information to consumers about products, services and technology.
- Knowledge from Customer, knowing what consumers know about the product, availability, competitors and the current market.

The three knowledges above called Customer Knowledge (CK), that can support knowledge for the organization namely as [10]:

Fig. 2. CKM workflow in purchasing process.

- *Knowledge for Organization*, where CK can provide knowledge to organizations about adjustment, competitive improvement, organizational efficiency and other related products, customer services, and marketing programs.

This is in accordance with the purpose of KM in Business is to direct the organization to utilize knowledge to improve the performance of the organization [2]. For CKM, it is more focused on costumer knowledge to improve the performance, advantages or benefits of the business itself. However, from a marketing perspective, the CKM workflow can be described as follows [10] (Fig. 2).

The application of CKM in CRM can be done with the following stages [1]:

Stage 1, information about costumers, this system is more personal from costumers to services (one to one), can be done through various channels. This collecting costumer data through various channels and this method is the task of CRM, and the result can be data for knowledge about costumers both who have become costumers and are still potential customers. This data is personal data, habits, pleasures/favorites, transactions and others that support it.

Stage 2, from costumer data, some potential customers can be generated as valuable information for the organization both in terms of organizational needs and the quality of costumers themselves. CKM can produce data concerning the ability and capacity of the organization to attract or follow up more to potential customers. Henceforth, it can be informed to potential customer in terms of increasing knowledge of products, services and technology in order to become the main costumers.

Stage 3, KM and CRM can provide information about the analysis of the benefits obtained in terms of attracting customer. This analysis is based on transactions and profits that occur from customers. Cooperation or service to customers can be improved if it shows positive benefits. Or another thing is information about the efficiency of the marketing process, sales or storage system, to generate more profit. This is an indirect transaction that occurs in customers.

Fig. 3. CKM Process.

Stage 4, Presenting information about market changes, lifestyle, competitors' plans and strategies, and possible improvement inputs from potential customers that make the organization more active. This can provide changes to the organization or cooperation partners to improve the service or performance required.

Figure 3 CKM Framework in CRM in terms of attracting customers.

2.   CKM Process

CKM as well as KM has the same process which can be described as follows [16].

CK Acquisition, is the initial process of CK. The collection and capture of knowledge are an important process in organizational memory. This process in CKM is a CK process from customers, about customers and to customers. CK is formed based on the accumulation of transactions for products and services or services, sales and marketing, and support from companies and competitors for customers, both potential customers, regular customers and even customers from competitors.

CK Storage, is the process where the CK is stored in the repository. This process dynamically indexes knowledge, and maps knowledge to specific needs. Repositories and knowledge mapping technologies are useful for organizing and categorizing knowledge.

CK Dissemination, knowledge sharing is a key condition for technology and product development. Improved performance can occur when a person gets information about the best practices, valuable lessons, experiences, both general and uncommon knowledge. Collaboration System is a means for such deployment, and depends on the customized organizational environment.
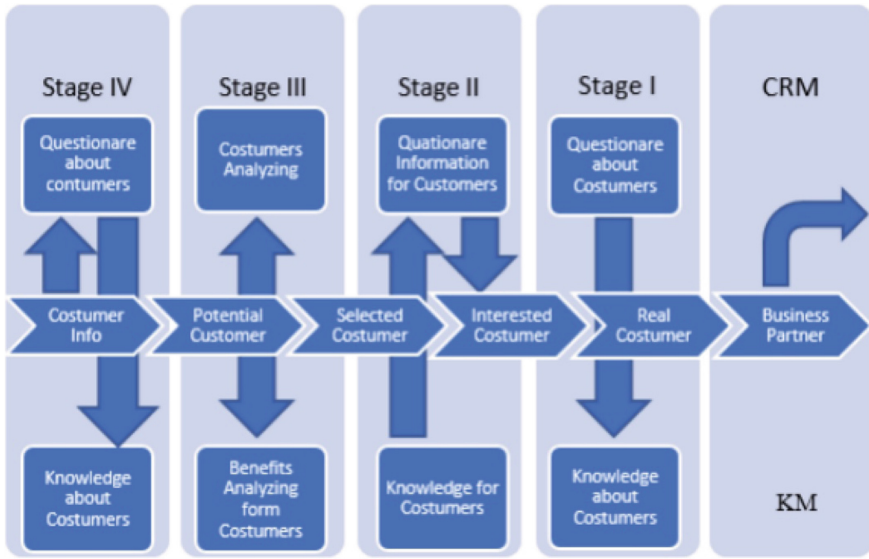
Fig. 4. Design of CKM.

CK Utilization, is very critical in CK implementation. This is related to the benefits obtained from CKM itself in accordance with the objectives of the business/business and organization. Utilization of CK relates to the organization's ability to use knowledge about and from consumers, consumer relations, and which products and services can be improved. In this case, organizational culture in learning the knowledge, competence and capabilities of the organization is very decisive.

3.   Application of KM in CRM for Admission Service of University XYZ

In accordance with the framework in Fig. 3 and the implementation of the process in accordance with Fig. 4, the steps taken are simply:

a. Dissemination and delivery of product/service information to consumers/customers, through marketing programs and others
b. Capture and capture potential customers, by providing interactions with consumers, such as web pages for registration information, by receiving calls from consumers or interactions through social media.
c. Analyze potential customers, and contact consumers with more detailed information with service/product offerings.
d. Bind consumers to make purchases of services/products
e. Capture information on consumer dissatisfaction, criticism and suggestions, or consumer experiences with product services.
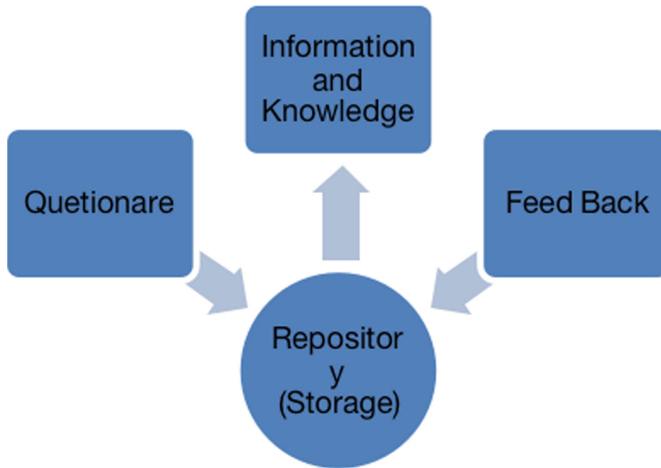f. Provide services to consumers to provide more services based on needs and input/information step (e).

Fig. 5. Knowledge Data Process.

The six stages above are the KM Acquisition process that stored in storage and can be categorized. The categories can do as following:

- Potential Customers
- Marketing Program Analysis
- Customer purchasing power
- Speed and efficiency of customer service, and more.

The model is used to design a form containing customers data and questionnaires that can be filled in in the form of choices. This questionnaire is designed based on the information and knowledge needs of a sales/customer servant. The design is in accordance with the framework of Fig. 3, with changes in CRM in the form of a questionnaire to be describe like Fig. 5.

Questionnaire provided integrated to admission registration software/application but it not feels like a questionnaire to consumer.

The process is described as follows.

From the design above, the data stored in the repository can be used for the next KM stage, as KM Utilization, to be utilized organizationally and for other capital increase needs.

5   Conclusion

The integration of KM in CRM and CKM models has now been implemented in several organizations and has become a must to gain a competitive advantage in terms of business competition and for the sake of increasing the performance and revenue of the company. The method used for the application of KM is relatively in accordance with the theory of KM implementation itself, the difference is the implementation strategy. The measurement of the success of KM implementation in CRM and in the marketing system

in general is something interesting to study, and there is no standard measurement yet. CKM becomes a model and will subsequently become the main term in the application of KM to CRM, including this being something of interest in KM development research in marketing systems.

References

1. Ali Attafar, Majid Sadidi, Hamideh Attafar, Arash Shahin.: The Role of Customer Knowledge Management (CKM) in Improving Organization-Customer Relationship, Middle-East Journal of Scientific Research 13 (6): 829–835 (2013)
2. Charlene van Zyl.: Knowledge management intersects with customer relationship management (CRM) for increased organizational for increased organizational, South African Journal for Information Management (2003)
3. Silvana Toriani, Maria Terezinha Angeloni.: CRM as a Support for Knowledge Management and Customer Relationship, Journal of Information Systems and Technology Management (2011)
4. Adrian Bueren, Ragnar Schierholz, Lutz Kolbe, Walter Brenner.: Customer Knowledge Management - Improving Performance of Customer Relationship Management with Knowledge Management, Hawaii International Conference on System Sciences – IEEE (2004)
5. Chor-Beng, Anthony Liew.: Strategic integration of knowledge management and customer relationship management, Journal of Knowledge Management. https://doi.org/10.1108/136 73270810884309 (2008)
6. Amine Nehari Talet.: KM Process and CRM to manage Customer Knowledge Relationship, International Conference on Economics, Business and Marketing Management (2012)
7. Dr. Sayyed Mohsen Allameh, Dr. Arash Shahin, Babak Tabanifar.: Analysis of Relationship between Knowledge Management and Customer Relationship Management with Customer Knowledge Management, International Journal of Academic Research in Business and Social Sciences (2012)
8. Silvana Toriani, Maria Terezinha, Angeloni.: CRM as a Support for Knowledge Management and Customer Relationship, Journal of Information Systems and Technology Management (2011)
9. Aurora Garrido-Moreno, Antonio Padilla-Meléndez, Ana Rosa Del Águila-Obra.: Exploring the Importance of Knowledge Management for CRM Success, World Academy of Science, Engineering and Technology International Journal of Industrial and Manufacturing Engineering (2010)
10. Khaled Nawaser, Majid Vatankhah Torbehbar, Raziyeh Zafari, Simin Vatankhah Torbehbar, Mohammad Ali Hajizadeh Gashti.: Role of Knowledge Management in Success of Customer Relationship Management, Applied mathematics in Engineering, Management and Technology (2014)
11. Vu Minh Ngo, Ravindra Hewa Kuruppuge, Lien Hoang Luong Nguyen.: Knowledge Management as a Strategy of Customer Relationship Management: A Study of Tourism Industry in Vietnam, Research Gate (2017)
12. Pan Huiming, Guo Yi.: The Application of Knowledge Management in Customer Relationship Management, Proceedings of the 8th International Conference on Innovation & Management
13. Hadi Nejatian Khalilabad, Omid Nasrollah Mazandarani, Ilham Sentosa, Shishi Kumar Piaralal.: The Impact of Knowledge Management on Customer Relationship Management, ReseachGate, (2006)
14. Zhang Hongqi, Lu Ruoyu.: A model for the Relationship between Customer Knowledge Management and Service Innovation Capability, IEEE (2008)

15. Yangcheng Hu, Enriched the Impact of Market Orientation on Knowledge Management: An Empirical Investigation in China, Third International Conference on Knowledge Discovery and Data Mining, (2010)
16. Arash Khosravi, Ab Razak Che Hussin.: Customer Knowledge Management: Development Stages and Challenges, Journal of Theoretical and Applied Information Technology (2016)
17. S. Sulaimana, M.K.A. Ariffina, G. R. Esmaeiliana, K. Faghihia, B.T.H.T. Baharudina.: Customer Knowledge Management Application in Malaysian Mobile Service Providers, Elsevier (2011)