Research Journal of Information Technology

ISSN 1815-7432

Academic Journals Inc.

www.academicjournals.com

Research Journal of Information Technology 2 (4): 264-271, 2010
ISSN 1815-7432 / DOI: 10.3923/rjit.2009.86.93

Mechanisms of Customer Knowledge Management in E-Commerce Websites*

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Abstract: The study aims to present a customer knowledge management mechanisms model (CKM3) which is based on the theoretical aspects stemming from the information retrieval and analysis of the latest results in related literature and the research multiple case study results. This model encompasses an extensive look at the three different dimensions of customer knowledge in more details than prior CKM researches and introduces the comprehensive set of electronic mechanisms in accordance with each identified types of customer knowledge. The study has important implications for e-commerce web sites seeking to improve their Business and customer value through effective selection and deployment of CKM mechanisms.

Key words: Dotcoms, customer relationship management, technology, customer value

INTRODUCTION

Companies recognize knowledge as a crucial resource in the competition and the importance of utilizing knowledge to gain a competitive advantage, but many of them still ignore Customer Knowledge (CK), which is at the origin of most improvements in customer value (Rowley, 2002). In order to have a good relationship with their customers, customer-focused companies specifically dotcoms have to communicate and interact with them in a satisfactory manner and continuously meet customers' changing needs. This requires the management of customer knowledge (Davenport and Probst, 2001; Garcia-Murillo and Annabi, 2002).

Customer Knowledge Management (CKM) is the application of Knowledge Management (KM) instruments and techniques to support the exchange of knowledge between an enterprise and its customers, enabling the company to make appropriate business decisions (Rowley, 2002). CKM constitutes a continuous strategic process by which companies enable their customers to move from passive information sources and recipients of products and services to empowered knowledge partners (Gibbert *et al*., 2002).

One of the most critical researches in the literature of CKM is the customer knowledge management concept which its writers are with the University of St. Gallen. The point of view from the University of St. Gallen derives from reflections about Customer Relationship Management (CRM). An essential idea is to use knowledge gathered to encounter with customers in order to support business processes. In accordance with authors of St. Gallen conception, the task of customer knowledge management is to design knowledge flow inside and between the CRM processes. A further task is to allocate relevant knowledge gained from customer-related processes to others.

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Originally Published in Research Journal of Information Technology, 2009

The research of Gibbert *et al*. (2002), which proposed five style of CKM, shows that by managing the knowledge of their customers, corporations are more likely to sense emerging market opportunities before their competitors, to constructively challenge the established wisdom of doing things around here and to more rapidly create economic value for the corporation, its shareholders and last, but not least, its customers. In their approach CKM refers to the management of knowledge from the customer i.e., knowledge residing in the customer, in contrast to knowledge about customers. Moreover they discuss that their approach is different from traditional Knowledge management in the objective followed: Where as traditional knowledge management is about efficiently gains (avoiding of re-inventing the wheel), CKM is about innovation and growth (Gibbert *et al*., 2002).

Zanjani *et al*. (2008) defined customer knowledge as a kind of knowledge (also data or information which can be analyzed, interpreted and eventually converted to knowledge) in the area of customer relationship, which has direct or indirect effect on our organizational performance. They proposed two conceptual models: one for describing customer knowledge formation and another for customer knowledge classification. One of the most important messages of this study is that customer knowledge can be formed by informational interaction between customers and diverse entities such as: our company, our other customers, our competitors and information and consulting institutes. They highlighted that we cannot manage all of these informational interactions; therefore, we have to focus on managing interaction between ourselves and our customer and between our customers.

Zanjani *et al*. (2008) also provided interesting definitions for three major types of customer knowledge. Knowledge for customer is a kind of knowledge (also data or information which can be analyzed, interpreted and eventually converted to knowledge) that our targeted customer attains in order to know us better. Often in the literatures, sources that provide knowledge for customer are overlooked. Data, information or knowledge for customers can be gained from our other customers, information consulting institutes, our competitors and the company itself to provide information needs of customer. Knowledge from customer is a kind of knowledge (also data or Information which can be analyzed, interpreted and eventually converted to knowledge) that the company attains in order to enhance its products and services. Knowledge about customer is a kind of knowledge (also data or information which can be analyzed, interpreted and eventually converted to knowledge) that the company attains in order to know its targeted customer better. Companies not only capture knowledge about customers but also purchase data, information and knowledge about customers (Zanjani *et al*., 2008).

With the development of the internet and budding of dotcoms, knowledge management in e-commerce is becoming important. In other words, the success of e-commerce increasingly depends on knowledge management (Borges *et al*., 2007; Lopez-Nicolas and Molina-Castillo, 2008; Saeed *et al*., 2005). The rhetoric of e-commerce emphasizes the opportunities for knowing customers in the new economy. E-commerce is a rich channel in which the service experience and customer data gathering are closely coupled (Rowley, 2002). The advancement of the Internet and e-commerce technology provides companies not only with new ways to create knowledge, but also with opportunities to improve their ability to manage and utilize knowledge (Siau, 2000; Nah *et al*., 2005). In this area, Nah *et al*. (2002) identified 21 km mechanisms through studying online successful retailing and auction sites. In the light of process oriented point of view, they supposed knowledge sharing, knowledge dissemination and knowledge acquisition as three tenets of their Internet-based knowledge management model and classified mechanisms according to them.

However, there is still a need to further elaborate on the concepts of customer knowledge and CKM (Rollins and Halinen, 2005), especially within the e-commerce context (Du Plessis and Boon, 2004; Tsai and Shih, 2004) which is far from fully understood (Lopez-Nicolas and Molina-Castillo, 2008).

Although CKM has been discussed in various circles, fewer studies tried to concentrate on CKM in the area of e-commerce. Also, the literature has neglected so far to discover a comprehensive set of CKM mechanisms in e-commerce websites.

In order to bridge this gap in the literature, the paper aims to present a model which is based on the theoretical aspects stemming from the information retrieval and analysis of the latest results in related literature and the multiple case study results. The model encompasses an extensive look at the three different dimensions of customer knowledge in more details than prior CKM researches and introduces the comprehensive set of electronic mechanisms in accordance with each identified types of customer knowledge. The paper has important implications for e-commerce websites seeking to improve their Business and customer value through effective selection and deployment of CKM mechanisms.

MATERIALS AND METHODS

In order to implement customer knowledge management concepts, companies need to deploy several mechanisms through the development of currently available web technologies. Many companies find CKM a difficult concept to grasp (Awazu and Desouza, 2004) and few are doing it well (Davenport *et al*., 2001; Gibbert *et al*., 2002).

The research was conducted for the last 5 months of 2008 .To achieve the main research goal; three-phase research strategy is employed in this study. At first, knowledge derived from an analysis of CKM Literature is used in order to design the preliminary conceptual model of customer knowledge management mechanisms by covering aspects referring to knowledge for, from and about customer in depth. Therefore, the phase provides us with suitable model for the case study in the second phase.

The second phase consists of an explanatory multiple-case study approach. Since the theory about knowledge management still represents an emergent and sometimes confusing field, the case study method seems to be the most suitable research strategy in this area. Due to its special characteristics, the case study method allows us to take a closer look at the unit analyzed.

According to multiple-case study results, some new mechanisms of CKM in selected e-commerce websites are discovered which the literature has until now neglected them. Therefore, in the last phase model is refined by adding the new identified mechanisms.

In this section, schema of gathered knowledge toward this research is presented. The customer knowledge management mechanisms model (CKM3) is exhibited in Fig. 1.

CKM3 (The Sea Star Model) is perceived in three layers. At the central part of the model customer knowledge is classified similar to other authors' statements in the CKM literature: knowledge for customer, knowledge from customer and knowledge about customer (Zanjani *et al*., 2008).

In the second layer, each type of customer knowledge is broken into more detailed parts. We classified knowledge for customer into company general information, company products and services information, company's environment information and complementary information. Company general information is a kind of knowledge that introduces organization in generic manner for example information about significant event, vision, mission and etc. Company products and services information at the point of number of mechanism is the biggest part of knowledge for customer that presents information about products and services. Company's environment information is a part of knowledge for customer that exhibit information about governmental rules, competitors, groups of industry and etc. Complementary information is cover indirect services for customers like account alert, site map, employment and etc. Knowledge from customer includes company-related information and competitors-related information. Company-related information is the result of customers' viewpoints about company and competitors-related information is the issue of customers' viewpoints about competitors. Knowledge about customer is highlighted and can be divided in prospective

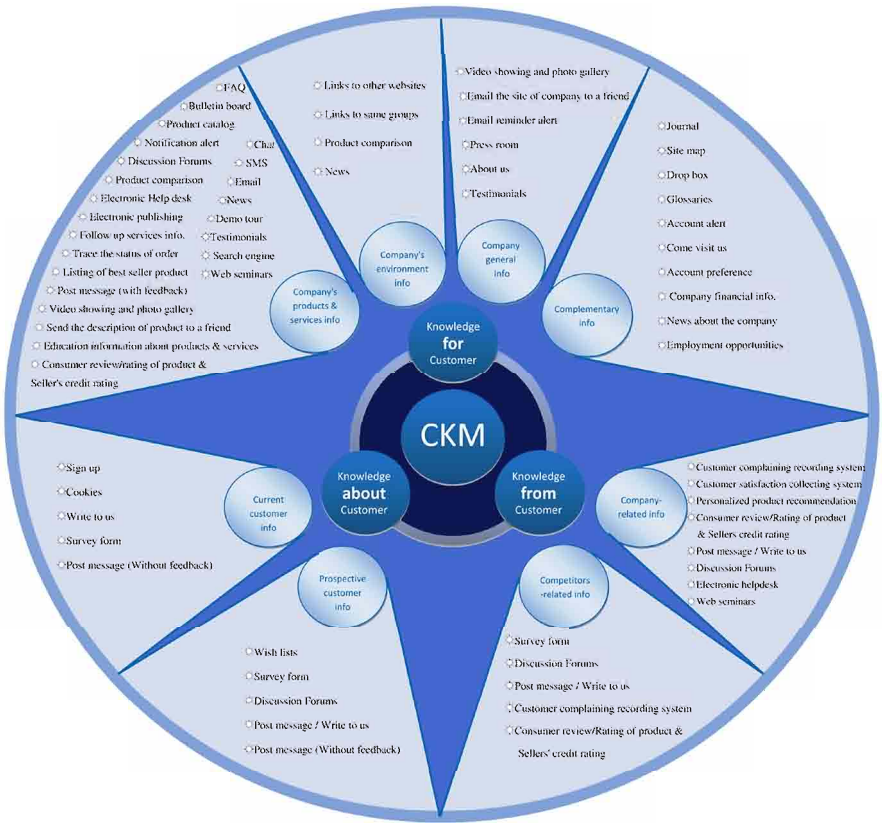

Fig. 1: The Sea Star Model (CKM3)

customer information and current customer information. Prospective customer information provides knowledge about comer customers for company. Current customer information is set of knowledge about customer requirements and help companies to analyze and program its situation in marketplace. This breakdown is shown in the circles like bumps that cover body of sea star.

Finally in the third layer, mechanisms which can be deployed for managing each category of customer knowledge that mentioned before, is introduced. Mechanisms in the proposed model are similar to tube feet's of sea star. As sea star latch on a surface and move by its tube feet, the CKM mechanisms make a near knowledge sharing between customers and company and help companies to outrun in an e-commerce arena. The model based taxonomy of these mechanisms is shown in Fig. 2.

RESULTS AND DISCUSSION

The methodology that used for evaluating proposed model was based on the web mining. In the multiple case studies, deployment of each identified mechanisms of the Sea Star Model in the top ten e-commerce websites according to time.com ranking list is studied. (This document can be seen in time digital archive: The 25 best e-commerce sites to watch: http://www.time.com/time/digital/reports/ecommerce/25best2.html). The selection of these websites is based on the introduced categories in this document. Three of cases were selected of best overall websites and seven cases were selected from other seven introduced fields (Best Shopping Tools, Best Auctions, Best Guides, Best Most Customer-Friendly, Best Idea for a Site, Most Customer Satisfaction and Best Gimmicks).

CKM Mechanism

for

mechanism	frequency
Listing of best seller product	10
Search engine	10
Product catalog	10
Post message (with feedback)	10
FAQ	10
Email	10
Bulletin board	10
Links to other websites	10
Product comparison	9
New in product	9
Links to same groups	9
News	9
About us	9
Send the description of product to a friend	8
Listing of best seller product	8
Follow up services info(warranty)	8
Electronic Help desk	8
Education information about products & services	8
Product comparison	8
Email reminder alert	8
News about the company	8
Site map	8
Trace the status of order	7
Personalized product recommendation	7

mechanism	frequency
Email the site of company to a friend	7
Employment opportunities	7
Top wish list picks	6
Discussion Forums	6
Account alert	6
Account preference	6
Drop box(facebook)	6
Notification alert	5
chat	5
Video showing and photo gallery	5
Press room(Announcement)	5
Glossaries	5
Testimonials	4
Consumer review/rating of product & sellers credit rating	4
Testimonials	4
Company financial info	4
Journal or newsletter	4
Electronic publishing system	3
Come visit us	2
Top brand	1
SMS	1
Demo tour	1
Web seminars	0

from

mechanism	frequency
Survey form	10
Post message / Write to us	9
Electronic helpdesk	8
Discussion Forums	6
Wish lists	6
Consumer review/Rating of product & Sellers credit rating	4
Web seminars	0

about

mechanism	frequency
Survey form	10
Sign up	10
Cookies	10
Post message / Write to us	9
Wish lists	6
Discussion Forums	6

Fig. 2: Frequencies of CKM mechanisms in the selected cases

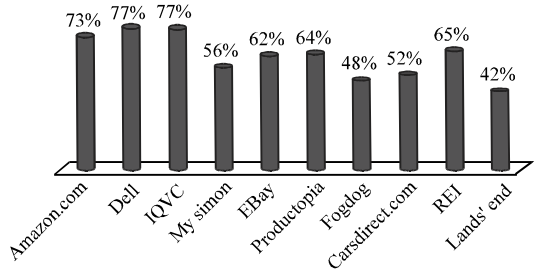

Fig. 3: Usage of CKM mechanisms in the selected websites

At the first, these websites' CKM mechanisms which also cover one of the aforementioned mechanisms in the conceptual model were scrutinized and these mechanisms were placed in kinds of knowledge (knowledge for, from and about customer). Then, the frequency of mechanisms in each kind of customer knowledge were gotten (Fig. 2).

Also the number of identified mechanisms which used in selected website were calculated (Fig. 3).

Finally sum of each website's CKM mechanisms in all kinds of customer knowledge was calculated and compared gathered data (Fig. 4). Figure 4 shows the dispersal of customer knowledge mechanisms amongst the top ten e-commerce websites. As the data indicates, CKM mechanisms that used in all websites are more concentrate on supporting knowledge for customer and least concentrate on supporting knowledge from customer.

Based on analyzing gathered data, the dispersal of mechanisms that used in selected websites in Knowledge for customer categories is calculated. In such a way, Fig. 5 depicts this analysis. As shown in this Fig. 5, mechanisms of knowledge for customer is most affected by Company's products and services info, sharing 58% of the total population studied within the cases.

By analyzing the frequency of knowledge from customer mechanisms, ratio of mechanism has been shown in Fig. 6. As shown in the Fig. 6, the results show a near correlation between company related information and competitors related information.

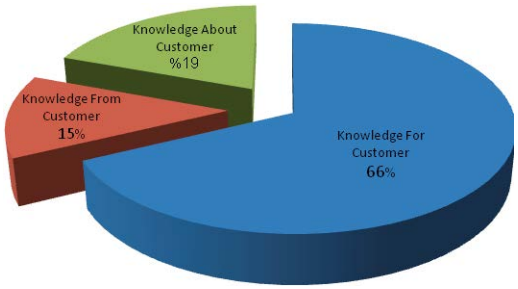

Fig. 4: Mechanisms dispersal according to types of customer knowledge

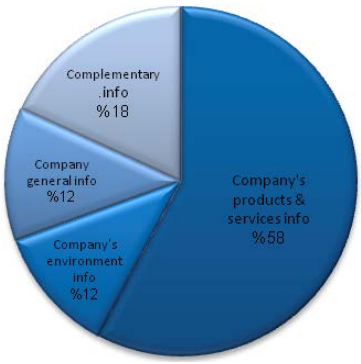

Fig. 5: Mechanisms dispersal according to types of knowledge for customer

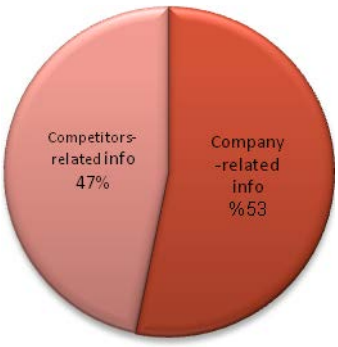

Fig. 6: Mechanisms dispersal according to types of knowledge from customer

Then the ratio of mechanism in two subdivision of knowledge about customer is calculated. As shown in the Fig. 7, knowledge about customer has much more allocated mechanisms for prospective customer information than for current customer information.

As a result of the research effort, a model for customer knowledge management mechanisms which the literature has neglected so far is proposed. The model helps businesses successfully identify and utilize all kinds of mechanisms for exploration of customer knowledge in order to enable their customers to move from passive information sources and recipients of products and services to empowered knowledge partners.

Fig. 7: Mechanisms dispersal according to types of knowledge about customer

One of the considerable outcomes of this research is that frequency of identified mechanisms in knowledge for customer, is sevenfold more than knowledge from and knowledge about customer and also 66% of observed mechanism in selected websites is in the zone of knowledge for customer. So, we can conclude that knowledge for customer is in the focus of tendency of e-commerce websites. We believe that tongue of dotcoms is working more than their ears and they are speaking rather than hearing.

One of the other important results of the study is that prevalent mechanisms in knowledge for customer that in all selected websites were seen are: listing of best seller product, search engine, product catalog, post message (with feedback), FAQ, email, bulletin board and Links to other websites. The only mechanism which deployed in knowledge from customer in all selected websites is Survey form. Also three mechanisms in knowledge about customer are identified that was seen in all selected cases: Survey forms, Sign up and Cookies.

As a result of the research, Dell and IQVC cover 77% of Sea Star Model mechanisms and on average in top 10 e-commerce websites, 62% of identified mechanisms are deployed. So, we can conclude that CKM is taken serious via e-companies and it is at the strategic focus of them.

As a serious limitation of this research we can mention that some of mechanisms for customer knowledge are invisible and their utilization is in the back office like data mining tools. Most mechanisms that are used in knowledge from and about customer are in this set, but most mechanisms in knowledge for customer are visible. This research is based on visible and traceable CKM mechanisms in the selected websites. Therefore, the gap between frequency of identified mechanisms in knowledge for customer and knowledge from and knowledge about customer may be affected by this fact.

Although web mining has some limitations but its benefit persuades the author to use it for the case study. One of the limitations is that finding mechanisms with the same name in multiple websites are too difficult and web miner should explore mechanisms from websites with dominance on concept in meticulous manner and has a precision view. Also diversity of the similar mechanism in different websites is too confusing and web designers with different style using homogeneous mechanism in variety places. These limitations may be influenced on the findings.

It will remain for future researches to refine the Sea Star Model. We also suggest other researchers to focus on effects of customer knowledge management on the indexes of performance in e-commerce websites.

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