International Review of Management and Marketing

ISSN: 2146-4405

available at http: www.econjournals.com

International Review of Management and Marketing, 2017, 7(1), 1-14.

Customer Knowledge Management as a Success Driver for Business in Mobile Sector of Pakistan

Shakir Hafeez[1]*, Li Lin Hong[2], Bilal Bin Saeed[3], Bilal Afsar[4]

[1]Department of Management Sciences, COMSATS Institute of Information Technology, Abbottabad, Pakistan, [2]Faculty of Management and Economics, Kunming University of Science and Technology, Kunming, China, [3]Department of Management Sciences, COMSATS Institute of Information Technology, Abbottabad, Pakistan, [4]Department of Management Science, Hazara University, Mansehra, Pakistan. *Email: shakir@ciit.net.pk

ABSTRACT

In this study, we reviewed the existing literature on customer knowledge management (CKM), paying special attention to the analytical and methodological studies, to define six success factors for assessing a company's CKM strategy. To assess these success factors, we opted to conduct a case study on Mobilink, Pakistan's leading telecommunications provider. Using our literature reviews, we devised a novel methodology that paired an external source-based assessment model, known as the butterfly model, and found that of the total 76 mechanisms outlined in the butterfly model, only 12 were not at all present at Mobilink, with a further 6 being unclear whether or not they were present also 47% of respondents agreed that grievances expressed by product consumers are a vital factor for thinking of and producing improved products, while another 40% mentioned that they thoroughly scrutinized the suggestions received by their customers before starting the major phase of the product development process. Around 37% of the respondents agreed that Mobilink encourage their customers to contribute in new and better products. The study concludes with some future directions by involving company stakeholders and academic researchers in CKM strategies.

Keywords: Customer Knowledge Management, Butterfly Model, Mobilink, Innovation, Pakistan Telecommunication
JEL Classifications: D83, L96

1. INTRODUCTION

Not surprisingly, today nearly every sector of business is obsessed with the idea of "knowledge," though each sector or industry describes this obsession differently. For example, most major business periodicals regularly feature articles on the coming of "Big Data" or "The Knowledge Economy" and their potential to alter the basic frameworks on which companies operate (King, 2011).

Another important change that is often a featured talking point in business studies are the changes that enhanced communications technologies - Notably the internet and more particularly the rise of social media and "Web 2.0" - that have forced businesses that focus on consumers to increasingly pay attention to how they interact with their customers. This emphasis on connecting with customers and building relationships is especially significant given the trends in both the labor force and world markets towards service and knowledge based economies (Teece, 1998). Some researchers examining these changes have gone so far as to conclude that we are not only in living in the information era, but also the customer-centric era, where providing a valuable product or service is no longer enough for companies to maintain market share or leading positions in a particular sector (Zack, 1999, Gawer and Cusumano, 2008). Instead, companies that effectively use information and information technologies to connect with their customers are the ones that will take the lion's share of profits and not only maintain their market leading position, but even advance it. Taking into account all of these changes, it is difficult to envision even the broad strokes of the future global economy. However, the general trends and rapid pace of change suggest that no matter what the eventual shape the global economy takes, the old paradigms of understanding it are outdated and unable to accurately help businesses take appropriate measures to improve their chances of success (Gunasekaran et al. 2001).

We submit that a new paradigm, whatever it may be, will ultimately revolve around three key factors, and their relationship to each other, will become increasingly important to businesses and to their growth in the foreseeable future: Knowledge, information and customers. To some extent, researchers have already noted the importance of these three factors. For example, there are numerous studies on the role of information and knowledge management (KM) in business strategies and processes. These largely focus on how companies can gather different kinds of information that can be used to increase a firm's competitiveness in its particular market or sector. Generally, these fall into the realms of either information management (IM) or KM (Soliman and Spooner, 2000). Likewise, numerous studies have explored how companies can more effectively manage the relationships with their customers to increase customer satisfaction and streamline company procedures for dealing with customer complaints or inquiries. These studies generally fall into the realm of customer relationship management (CRM) (Wilson et al. 2002). Despite the advances made in each of these three respective fields, few studies have investigated the connection between each of these. For example, to date the central point of such studies has been to examine effective KM depends on certain organizational traits, such as the perceptions and beliefs held by companies in general and by employees charged with KM in particular affect how firms utilize KM to gather, create, and disseminate knowledge that fuels innovation and growth. Likewise, most studies on these topics focus on how to manage information within a company to effectively distribute and disseminate important information between different units or offices within a company, but few of these have attempted to delineate the differences between IM and KM, but few have broken this down epistemologically to examine the different between knowledge and information (Tsai, 2001). Similarly, several studies have examined CRM as it pertains to gathering information from customer complaints or inquiries, but few have applied a detailed understanding of different kinds of customer knowledge (CK) as it relates to building relationships between a firm and its customers. Still fewer studies have actually investigated the relationship between all three - Information, knowledge, and customers. Those that have proposed that the only solution to the shortcomings of IM, KM, and CRM are to use a new type of strategy, customer KM (CKM) to understand the differences between information and knowledge, the different types of customer knowledge, and how to gather, manage and disseminate this information across a firm to foster innovation and more effective uses of CK (Gibbert et al. 2002).

CKM, as the fusion of the three other forms of management, IM, KM and CRM, has been proposed as the gold standard of management strategies a company can use to build relationships with its customers and use the information it gains to gain an edge on its competitors (Rollins and Halinen, 2005). Unfortunately, studies on CKM are rather limited, and have their own shortcomings. As a comparatively new field of study, there are few effective models to understand how effectively companies use CKM, or to describe the general nature of the strategies, processes, and mechanisms that comprise such a CKM strategy. This study is primarily concerned with evaluating these studies and their methodologies to explore the state of the field of CKM studies. Furthermore, this present study is particularly concerned with examining the advantages and shortcomings of these studies methodologies to highlight how researchers currently understand CKM, and how improvements to this understanding can be translated into practical suggestions that would help companies assess their existing CKM processes or implement entirely new ones.

Rather than presuppose that firms simply do not gather customer information, we began this study by asking several key questions aimed at explaining what kind of knowledge businesses gather and what they then do with it, as well as how both the acquisition and usage of that knowledge can be improved. These questions were each answered in respective parts of this study.

1. To what extent do firms view customers as a source of knowledge?
2. To what degree do companies understand different types of CK?
3. To what extent do firms consider the differences in these types of knowledge in their CKM efforts?
4. Does the firm adequately implement appropriate mechanisms to gather this knowledge and communicate with their customers?
5. After this knowledge is gathered, is it appropriately managed and shared throughout the company
6. To what extent do CKM efforts support innovation efforts that contribute to a given company's success?

2. LITERATURE REVIEW

Knowledge is the key competence required to face business challenges of firms (Tseng, 2016). The end goal of KM is successfully obtaining the maximum value from the existing knowledge within an organization. Sharing knowledge through collaborative innovation is increasingly important (Fidel et al, 2015). Though the specifics can vary from industry to industry, a basic succinct definition of KM is that it is an efficient way to move information and knowledge to the specific individuals, at the finest time, in the accurate arrangement, and at the most optimum cost. For business practices, "KM is the systemically and organizationally specified process for acquiring, organizing, and communicating knowledge of employees so that other employees may make use of it to be more effective and productive in their work" (Alavi and Leidner, 2001).

2.1. CKM

The greatest challenges to implementing CKM as an effective business strategy are separating out and understand each of the constitutive components. These are largely piecemeal studies used to offer some perspectives on the difficulties that companies face adopting strategies that focus on building relationship from their customers.

The most important type of knowledge would appear to be CK (Aghamirian et al., 2015). Effective use of CK can improve innovation, help recognize evolving market openings, and support the management of enduring customer relationships, the kind of relationships that are paramount in gathering high-quality information about a product or service (Darroch and McNaughton,

2003; Rollins and Halinen, 2005). It is of little wonder then that managing CK has become the most important aspect of KM in many companies (Stefanou et al., 2003) and that KM capabilities are often found to be crucial factors in successful implementations of CRM (Croteau and Li, 2003; Rollins and Halinen, 2005).

Many traditional CRM projects failed because they did not adequately serve customers and concurrently failed to integrate disparate data sources in any useable fashion (Bose and Sugumaran, 2003). Technological advances have made it relatively simple for organizations to use diverse tools to collect customer data from numerous contact points with customers, but converting enormous amounts of such customer data into customer information, or more crucially, CK, has been extremely challenging (Davenport et al. 2001). Difficulties like these have continually frustrated market research experts who strive to utilize customer data gathered from traditional CRMs as CK. The most elegant solution to these difficulties is to simply integrate KM into existing CRM systems. Figure 1 shows the difference between KM, CRM and CKM.

While many other studies have tangentially highlighted the significance of well-made CRM procedures and the understanding of the customers' perception in relationship development - Bang (2005), for example, argued that a well-designed CRM process, rather than IT, was critical for CRM performance in business - there has been little systemic treatment of the issue. On the whole, there is a definite and urgent need for better managing CK based on the synergies of CRM and KM. Two key studies that have significantly attempted to allude to this need focused on the concept of CKM both of which have been subsequently identified and cited by most CKM studies. The first was Gibbert et al. (2002), who described:

"CKM (as) the strategic process by which cutting edge companies emancipate their customers from passive recipient of products and services, to empowerment as knowledge partners. CKM is about gaining, sharing, and expanding knowledge residing in customers. It can take the form of prosumerism, mutual innovation, team-based co-learning, communities of practice, and joint intellectual property management." Figure 2 shows the five different sources of CKM.

2.2. The Evolution of Measuring CK and CKM

CKM is essentially the application of the instruments and methods of KM to enable the exchange of information between a company and its customers in such a way as to gain valuable

Figure 1: Differences of knowledge management (KM), customer relationship management, and customer KM

	KM	CRM	CKM
Knowledge sought in	Employee, team, company, network	Customer Database	Customer experience and creativity
Axioms	'if only we know what we knew'	'retention is cheaper than acquisition'	'if we only knew what our customers know'
Objectives	Sharing knowledge about customers among employees	Mining knowledge about the customer	Gaining, sharing and expanding knowledge of (inside) the customer Individual or group experiences in applications, competitor behavior, possible future solutions, etc
Role of customer	Passive, recipient of product	Captive, tied to product by loyalty schemes	Active, knowledge partner.
Recipient of Incentives	Employee	Customer	Customer
Corporate role	Lobbying knowledge hoarding employees	Captivate customers	Emancipate customers
Business objectives	Efficiency and speed gains, avoidance of re-inventing the wheel	Customer base nurturing, maintaining our customers	Collaboration with customers, joint value creation
Conceptual base	Customer retention	Customer satisfaction	Customer success, innovation, organizational learning
Business metrics	Performance against budget; Customer retention rate	Performance in terms of customer satisfaction and loyalty	Performance against competitors in innovation and growth; Contribution to customer success

Source: Gibbert et al. (2002)

Figure 2: Five style of customer knowledge management

Style/ Characteristic	Prosumerism	Team-based Co-learning	Mutual Innovation	Communities of Creation	Joint IP/Ownership
Focus	Developing tangible assets and benefits	Creating corporate social capital	Creating new products & processes	Mission-specific. Professional expertise	Tangible customer IP sharing
Objective	Improved products & resulting benefits	Facilitate team learning for dealing with systemic change	Create max. return from new ideas	Obtain & explicate professional expertise	Max. returns on IP (jointly)
Processes	Pre-, concurrent- & post- production integration	Teamwork, empowerment, case development, quality programs	Idea fairs; brainstorming; customer Incubation	Best practices CoP's, expert networks	Apprenticeships Formal training programs On job training
Systems	Planning, control and decision supply systems	Knowledge sharing systems, digital 'nervous' systems, customer visits in teams	Idea generation support systems	Expert systems, shared e-workspaces, group support systems	Group IP support systems
Performance Measures	Effectiveness & efficiency, customer satisfaction & success	Systems productivity, quality, customer satisfaction & success	ROI from new products & processes, customer success	K-sharing behavior, timeliness of decisions, Rate of hyperlinked results	Value of new IP, incremental ROI on new revenue streams
Case Examples	Quicken; IKEA	Amazon.com; Xerox, Holcim, Mettler Toledo	Silicon Graphics, Ryder	Microsoft; Sony; eBay, Holcim	Skandia
Intensity of Interaction	Relatively low	Low to high	Relatively low	Relatively high	Relatively high
Type of Knowledge	More explicit	Explicit and tacit	More tacit	More tacit	More explicit

Source: Gibbert et al. (2002)

knowledge from customers that can be brought into the company and help foster innovation. As an outgrowth of KM, a great deal of techniques used to model customer KM are derived from earlier KM models eared around obtaining information about customers and, to a much smaller extent, the knowledge they have. In reality, most of these efforts were focused on trying to gather use knowledge not to improve services or products, but instead to gain new customers.

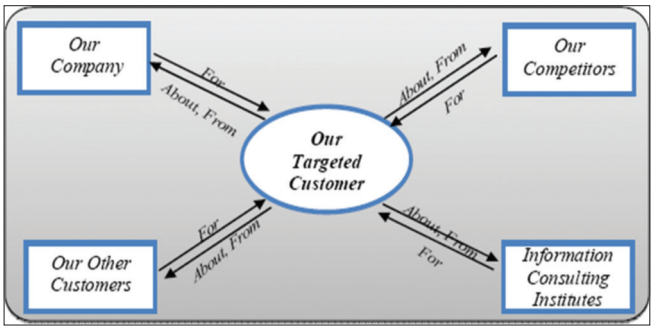
Accordingly, trying to gather knowledge about their existing customers as well as their thoughts and preferences was only a small part of a larger endeavor to build market share. Zanjani et al. (2008) summed this up this notion when dismissing the earlier epistemological models as depending too much on the inherent value of simply gathering knowledge without actually trying to assess whether or not that knowledge was valuable. Here, companies used a quartet of different data sources to try and identify where their target customers were. What information they could gather from customers was used to supplement data from consulting firms, their competitors as well as internally gathered data about purchases, preferences and demographics. At the heart of this traditional model was the target customer, with information for, about or from them on the periphery (Figure 3).

While this model succinctly describes how traditional KM was used in relation to customers, it poorly described exactly what this information and where it would actually come from, save for in the broadest sense: E.g., information about target customers can come from the company, other customers, consultants or competitors. This model also gave companies a way to understand where their information came from, but not how to classify it-making it a rather poor template for companies to actually assesses what kind of knowledge assets they were gaining or how their own strategies could be understood and improved upon it. Perhaps the most glaring shortcoming was that it did little to distinguish between the types of knowledge that could be obtained. Likewise, this model does little to articulate where information comes from, or how information gathering can be integrated into a discernible strategy to facilitate more effective CKM strategies. To improve on these deficits, several recent studies have posited several different models of understanding CKM.

To improve on the lack of organizing the knowledge gathered in KM and CKM, Zanjani et al. (2008) proposed a more refined model. This model breaks down each type of CK into more discrete and specific segments into three layers. Each layer contains the different types of CK.

While epistemological models like Zanjani's are informative, they are primarily concerned with understanding the origin of different types of knowledge. Unfortunately, all such models share some inherent flaws in trying to serve as jumping off points for measuring a company's CKM strategy. As Gebert et al. (2003) put it, "They focus on the inner characteristics of the entity knowledge and neglect the relationships to the environment (which) does not allow (one) to draw any conclusions about its value in a business process. Epistemological KM models are therefore not able to support business processes when trying to identify and manage valuable knowledge." Similarly, Zanjani et al. (2008) noted that companies cannot manage all the information interactions that occur to create the total body of knowledge a company gathers, but can instead focus on making sure the interactions between the customers and the company are done in such a way as to facilitate knowledge. In theory, this is an excellent recommendation, but Zanjani proposed no clear way of making this shift, as his model was primarily concerned with understanding the different kinds of knowledge companies can obtain through implementing CKM strategies.

Figure 3: Quartet customer knowledge management model focusing on target customers

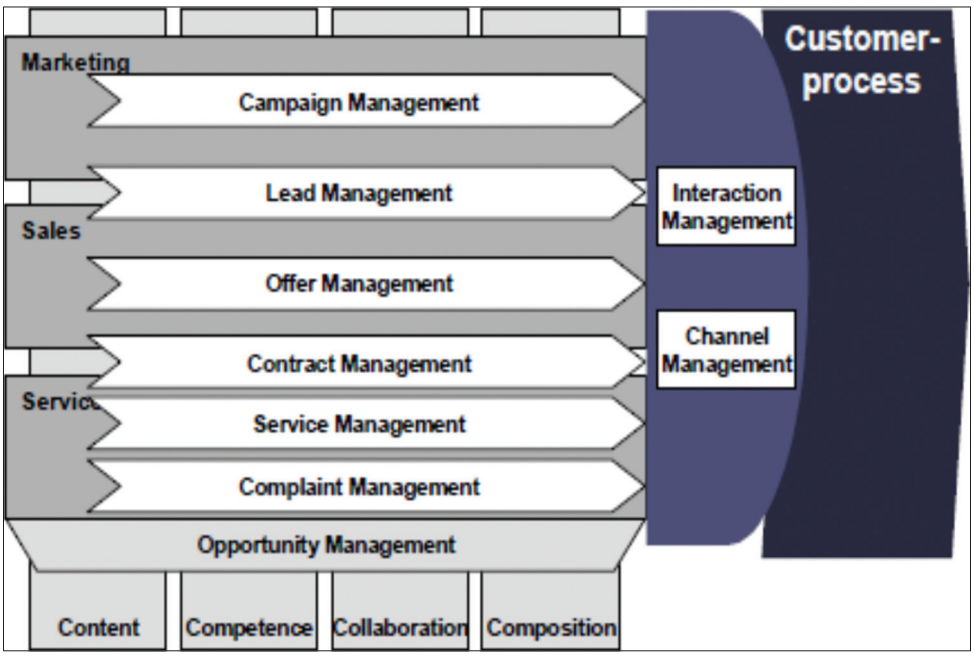


Source: Zanjani et al. (2008)

Gebert (2003) proposed another model (Figure 4), here the different types of CK are embedded into the different processes that generate them. Knowledge for customers is mainly comes from outside the model's framework, such as research and development initiatives and production of either products and services, with campaign management being responsible for collecting and presenting this information to the customer. This knowledge is then distributed via other CRM processes, primarily offer, contract and service management. CRM strategies are accordingly responsible for making the knowledge accessible and easy to understand and disseminate to interested customers. Knowledge about customers is gathered through offer, service and complaint management, as well as through contract management when applicable, and is management by campaign and service management channels, both of which can be tailored to the customer and respond to customer needs. Unfortunately this particular aspect of knowledge about customers can be difficult to gather because it is expensive and require taking time away from serving customers. Knowledge from customers is gathered in a similar fashion.

Gebert fully acknowledges that customers gain a great deal of expertise when using a service or product, and ideally "can be seen as equal partners, when discussing changes or improvements," though "this aim is not commonly understood in the business world and its impacts poorly researched" (Gebert et al., 2003). While this process model gives clear direction on how different parts of a company can work together in focusing on customer interactions by augmenting their usual CRM processes to gather some knowledge about, for or from customers, interaction with customers and actually taking their knowledge into the company is seen as an end goal, not a starting point. In fact, CKM is not even a primary goal of the model; it is instead an add-on to CRM, and one that Gebert contends should be approached with caution because it may prove too distracting to be worthwhile. What this model gains in efficiency focusing on process, it loses by taking relatively

Figure 4: Process oriented customer knowledge management models



Source: Gebert et al. (2003)

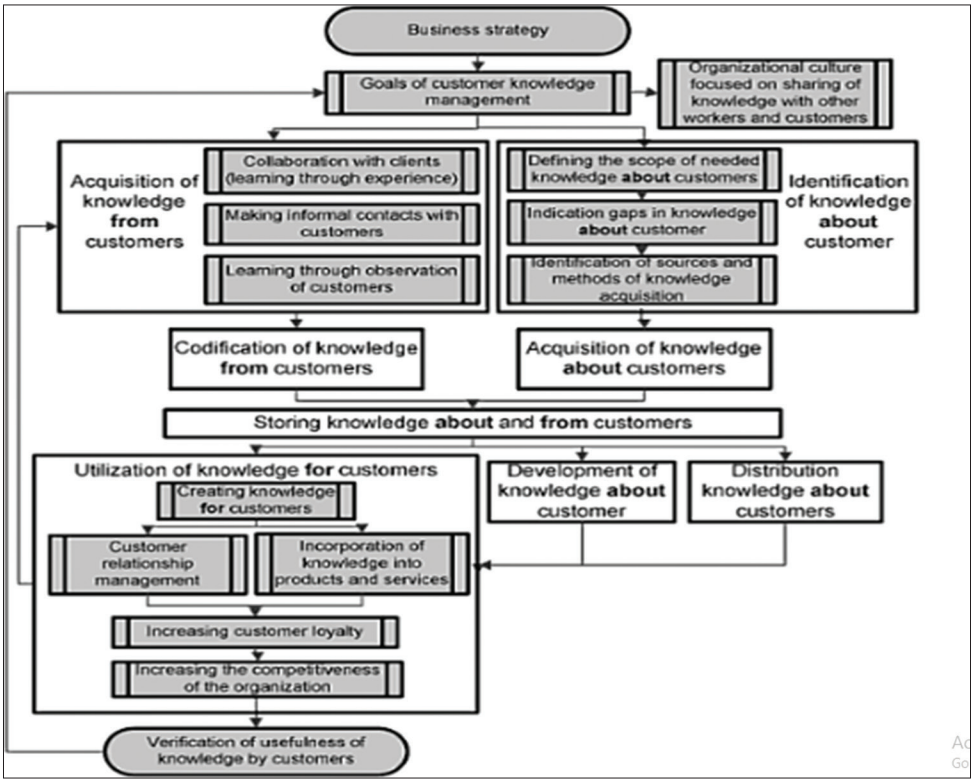
little attention to the different kinds of knowledge customers can offer and what value they may actually hold - A key advantage to Zanjani's earlier though more simple model.

Though there are other models aside from those proposed by Gebert or Zanjani, these two models are exceptional examples of the strengths and weaknesses of different understandings of CKM modeling, and emphasize the two initial approaches to understanding CKM. Given that each model has certain trade-offs, the logical solution to the shortcomings of both Zanjani's epistemological model and Gebert's process driven one is to try and unify both the into an integrated CKM that can both give companies a template for effective business strategies and help them understand what kinds of knowledge they are gathering, as well as where that information actually comes from. Buchnowska (2011) proposed such a model in a later study where they sought to take the initial process driven model that Gebert proposed and integrate the epistemological foundations from Zanjani's model that anchored the three types of knowledge relating to customers. In this model (Figure 5), each type of knowledge is tied to a different avenue of the business process, with the requisite units outlined, as well as their relationship to one another. In this model, both CRM and KM approaches are combined alongside the epistemological foundations of Zanjani's et al. (2008) model, ostensibly to "reduce the risk of failure of this kind of project" because particular types of knowledge are not disjointed from the businesses processes that generate them, but are instead integrally linked. In this model, the initial step is considering the business CKM strategy, and then articulating the overall goals of the project. From there, different units then acquire knowledge from customers while others seek to identify knowledge about those customers.

One particularly interesting aspect of this model is that knowledge from customers and knowledge about customers are linked in such a way as to exert a synergistic effect; i.e., the more a company can know about their users, the more effectively they can use information from them. From there, all information is then stored and, in theory, curated and cataloged so that it can more readily be used by one of three actions: Utilizing the knowledge destined for the consumer, or alternatively developing/distributing knowledge about them to all the appropriate project stakeholders and process owners. This information is distilled and passed along the chain of employees who seek to use it to develop better products and services, until finally it leads to increased customer loyalty and increased competitiveness of the business. At this point, CKM project leaders can report to their superiors and give a thorough analysis on the effectiveness of the project and the usefulness of the information, which then feeds back into the beginning step of the algorithm indefinitely, until an ideal strategy is formulated and executed in repetition.

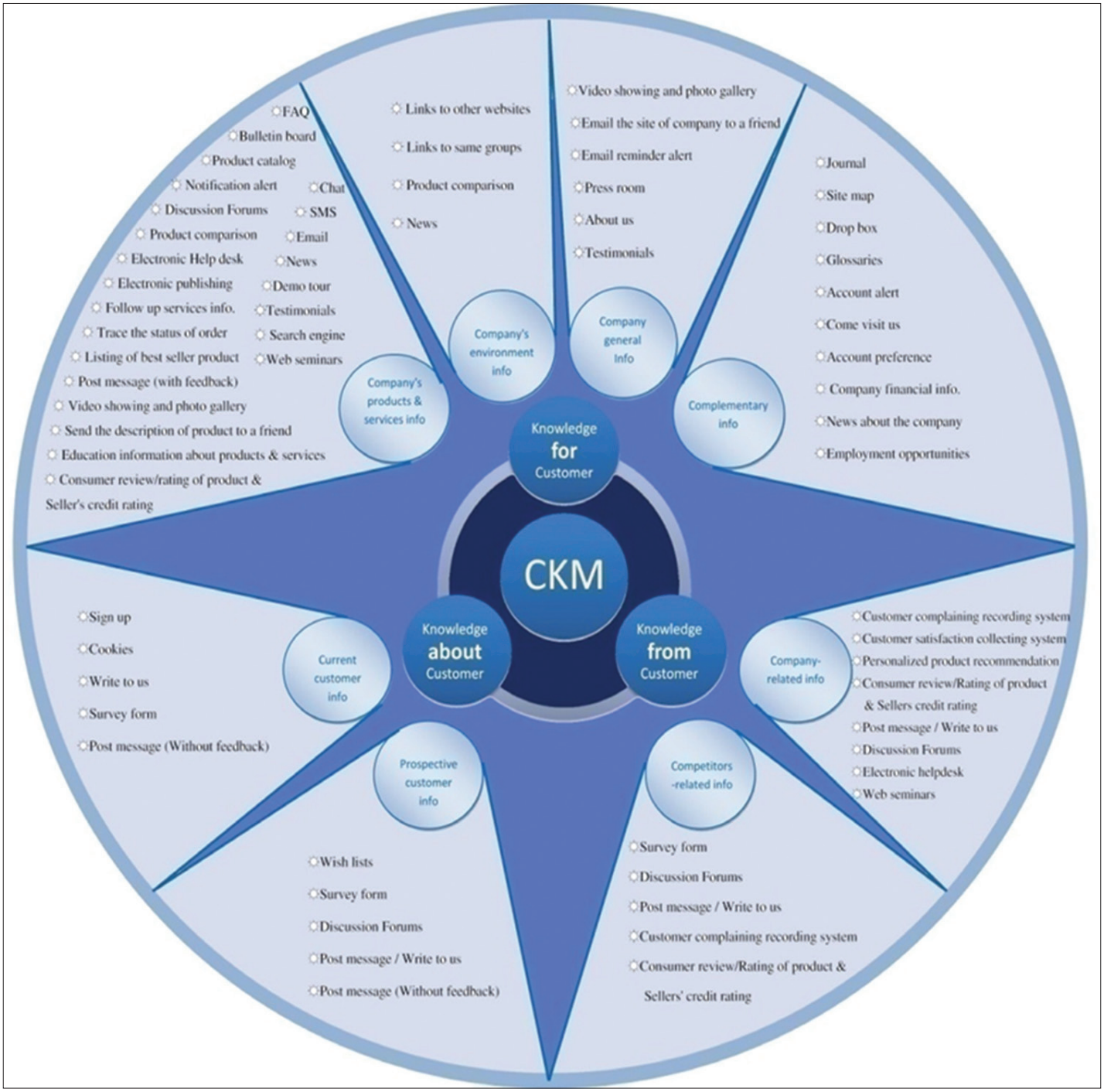
Zanjani et al. (2009) were able to greatly improve on their previous epistemological model and proved a source-based model, called the sea-star model (Figure 6). The key advantage over the earlier epistemological model and the process driven and integrated hybrid models is that this sea star model actually allows companies to take a survey of their collection efforts to identify what kind of information they want to gather and how much effort should be put into it. Rather than starting at the strategy or the division of the company responsible for collecting the information, the Sea Star source-based model allows a more granular view which shows what mechanisms actually collect the data.

Figure 5: Process driven customer knowledge management models



Source: Buchnowska (2011)

Figure 6: Sea star model



Source: Zanjani et al. (2009)

Such information can be extremely valuable in assessing how to revamp KM efforts or how to develop a toolkit that can then be put into practice in a variety of different business models.

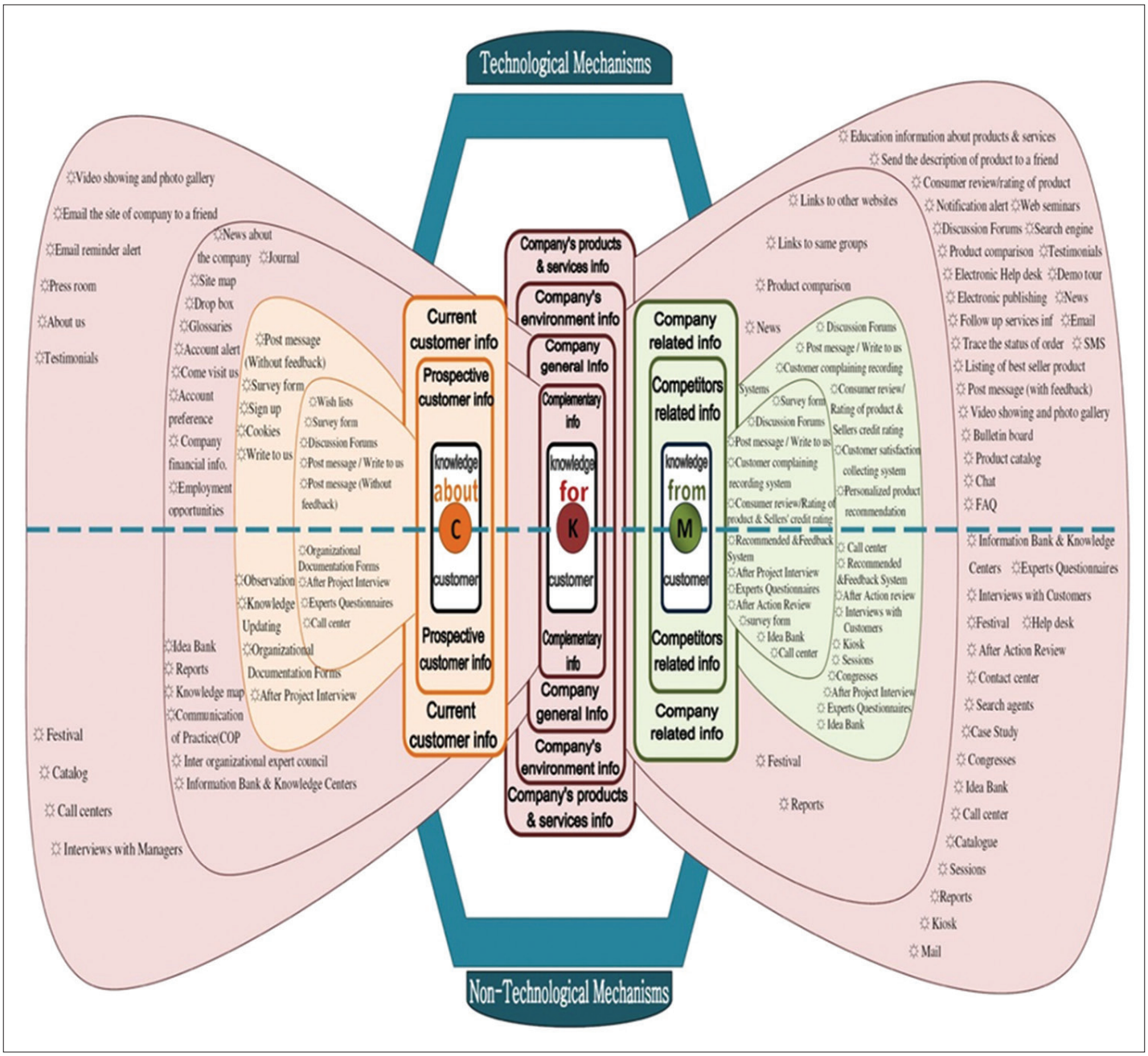
The previous models of understanding CKM have offered both strengths and weaknesses. Collectively, the greatest shared weakness was that the models were too parochial, offering only limited ways for a business to assess their CKM efforts with not enough attention to the actual mechanisms that actually help enable communication between businesses and their customers. The sea star model was a notable exception, as it was the first to offer a comprehensive toolkit of mechanisms that were detailed enough to help explain how knowledge could be gathered.

Conceptually, the butterfly model offers numerous superiorities over both its direct predecessor-the sea star model-and its indirect epistemological and process-driven progenitors. On the whole, the butterfly model is far more detailed, more organized, and better able to provide a toolkit that businesses can use to understand their own CKM strategies or even to develop tools that will enable them to execute one. Likewise, unlike the sea star model, it contains a thorough listing of both technical and non-technical

mechanisms (NTM), making it ideal to assess "click and mortar" businesses that conduct large parts of their business both on and offline In many ways, this model answers the basic gap in the literature that Gebert had earlier identified when he asked: "Why do many customer-driven companies not access the knowledge of their customers directly? The problem is that the existing mindset, as evidenced from the literature, provides very little assistance to these companies" (Gebert et al., 2003). By most metrics, the butterfly model would succeed in this endeavor, but the unfortunate reality is that while the other models had shortcoming, they had generally been empirically tested using a variety of case studies that at least provided some insight into the kind of results that these models could, and could not obtain. Being a relatively recent addition to the literature, the butterfly model has not yet, to the best of the author's knowledge, been used to empirically assess a company or firm's CKM strategy nor the mechanisms or knowledge that can be obtained from them. Figure 7 shows the Butter Fly model of CKM. In this study, we opted to use the butterfly model to study CKM efforts of our test case regarding question 3 and 4, which explore the mechanisms used as part of a CKM strategy and, and by inference, whether or not the company considers different types of knowledge in its CKM efforts.

The butterfly model is well suited to the latter question, because it shows how different mechanisms collect different types of knowledge, allowing us to piece together what kinds of knowledge are being gathered by looking at the mechanisms a company deploys. Generally though, the butterfly model was chosen for

Figure 7: Butterfly model of customer knowledge management



Source: Sakhaee et al. (2012)

two main reasons. First, conceptually, the butterfly model offers numerous superiorities over both its direct predecessor-the sea star model-and its indirect epistemological and process-driven progenitors. On the whole, the butterfly model is far more detailed, more organized, and better able to provide a toolkit that businesses can use to understand their own CKM strategies or even to develop tools that will enable them to execute one. Secondly, unlike the sea star model, it contains a thorough listing of both technical and NTM, making it ideal to assess "click and mortar" businesses that conduct large parts of their business both on and offline. By that, we mean the thoroughness of the butterfly model's mechanisms allow us to look at the company from the outside and map out what mechanisms appear to be implemented.

3. METHODOLOGY

The primary goal of this study is to investigate the usage of CKM in a more detailed manner. Assessing CKM can be done by measuring six key success factors:

1. To what extent do firms view customers as a source of knowledge?
2. To what degree do companies understand different types of CK?
3. To what extent do firms consider the differences in these types of knowledge in their CKM efforts?
4. Does the firm adequately implement appropriate mechanisms to gather this knowledge and communicate with their customers?
5. After this knowledge is gathered, is it appropriately managed and shared throughout the company
6. To what extent do CKM efforts support innovation efforts that contribute to a given company's success?

In designing our study, we took these success factors as our baseline inquiries in designing a case study to measure the effectiveness of Mobilink CKM strategy.

Given the broad scope and potential implications of research, we sought to find a suitable test-case where we could explore the answers in more concrete detail. Though there are myriad possible corporations or sectors that would be theoretically be viable models, but given the three broad changes to the global economy-the shift of economic centers to Asia, the growing importance of rapidly developing economies in the region, and the growing importance of information and services-we opted to focus our efforts on the Pakistan telecom sector. Given the rapid growth of the sector and the importance of Pakistan as an emerging market and key geopolitical player in Central Asia, mobile communications in Pakistan is a dynamic field that offers excellent possibilities for researching CK concepts and practices in action. Moreover, according to the World Economic Forum's Global Information Technology Report 2010-11, Pakistan ranks no. 1 in the Internet and Telephony Competition. Similarly, mobile Telecom structures are quite complicated and vary from country to country, but in highly competitive telecommunications markets-such as that in Pakistan-suppliers are under constant pressure to introduce new products and services, meaning that they have to become increasingly creative and innovative to maintain their position in the market. Such companies are likely at the forefront of the customer-centered market era, and would then provide an excellent opportunity for examining how CK is used to maintain an edge.

For the case study firm, we selected Mobilink. As a leading player in the Central Asian Telecom market, Mobilink has a market share of near 30%, while its parent company, Orascom Telecom Holding S.A.E., has grown to become a major player in the global telecom market, being among the largest and most diversified network operators in the Middle East, Africa, and South Asia, with a population under license of around 430 million people and an average penetration of mobile telephony across all markets of approximately 40%. Mobilink in addition to providing advanced voice communication services, they also offer a host of value added-services and placed a high importance on expanding coverage in geographically difficult areas (now covering 10,000+ cities and towns nationwide as well as over 130 countries on international roaming service).

We used the Butterfly Model to assess the available CKM mechanism currently used by Mobilink. From there, we inferred which types of CK were currently being gathered within Mobilink. We also conduced semi-structured interviews with experts within Mobilink to collect qualitative and quantitative data on how Mobilink employees viewed customers as a potential source of innovation. Data collection done over a 5 months span, the sample size was one hundred and ten employees out of which only ninety employees well responded to our questions. Interviews were conducted in a semi structured format, with a list of general questions and topics to be covered to ensure adequate coverage of areas related to the research questions. Data gathered through the interviews was used to assess how Mobilink employees personally thought or knew about their companies CKM efforts, and their personal perceptions of customers. Following the interview, we also provided a written survey so respondents could further explain their thoughts on the general concepts in the interview.

4. RESULTS AND FINDINGS

4.1. Results of Question 1: Are Mobilink Customers Involved in Innovation Processes?

Our first survey question dealt with how effectively Mobilink involves its customers in product development. Specifically, we asked "Do companies involve customers in the process of product development?" To assess the degree of customer involvement in the innovation process. Answers from our responders showed in Table 1 i.e., nearly half thought that customer complaints may server as a beginning point in innovation, though when we were more specific, asking if customers could create product concepts or evaluate prototypes, positive responses lowered markedly.

Numerous respondents pointed out that the discussion with customers remained the ultimate significance and that customer complaints possibly serve as a preliminary point for innovation. Totally, 47% of respondents agreed that grievances expressed by product consumers are a vital factor for thinking of and producing improved products, while another 40% mentioned

that they thoroughly scrutinized the suggestions received by their customers before starting the major phase of the product development process. A smaller, but still significant percentage (27%) thought that their company offered customers the choice to craft product concepts, though only 13% thought that they let or should let customer evaluate prototypes or potential products/services. This last response is quite surprising. It is increasingly becoming an industry standard for companies to have prototype assessment in order to get an early and quick feedback from their customers about new products or services. Thankfully, only 7% of respondents actually thought that customer involvement was a detriment and could be costly and more hazardous.

4.2. Results of Question 2: Does Mobilink Understands and Accept Customers as a Source of Innovation, and are there Dedicated Mobilink Personnel to Deal with CK?

The main focus of this second set of questions was to gain a better view of Mobilink's implementation of CK and check whether there were any staff or department in the organization whose primary concern was obtaining and using CK. Thematically, these answers should help paint a clearer picture about the organization acceptance of the customer's role in innovation processes, more so than the previous question which largely revolved around how experts perceived customers, because this question assessed whether there were any operational or processes devoted to CKM (Table 2).

Most of the respondents indicated that there was staff dedicated to CKM, but few were able to specifically identify or enumerate them. Likewise, most employees had little idea (17%) of how long the company had these departments or personnel.

Table 1: Results of customer involvement in the innovation process

Specific questions	Percentage of yes
Customer complaints may serve as a starting point in innovation, yes or no?	47
Customer suggestions may serve as a starting point in innovation, yes or no?	40
Customers can effectively create product concepts, yes or no?	27
Customers can effectively evaluate prototypes, yes or no?	13
Customers do not at all or should not at all participate in innovation, yes or no?	7

Table 2: Results of question set 2 on Mobilink's use of CKM staff

Specific question	Yes/I know (%)	No/I do not know (%)
Are there staff in your department related to gathering or using customer knowledge?	70	30
Do you know the number of employees devoted to customer knowledge?	26	74
Do you know how long Mobilink has had this department or personnel?	17	83

CKM: Customer knowledge management

Totally, 70% of the surveyed employees indicated they knew of staff in Mobilink that were exclusively or primarily concerned with obtaining and making use of CK, while 30% percent indicated there was no staff or department responsible for CK. The difference suggests that there are some staff within particular units or departments concerned with CKM, but as we were not provided any definitive answer from Mobilink corporate communication channels, this result is only suggestive or such staff, and not conclusive. It stands to reason that given high-level of resolved customer complaints (99.1%) and Mobilink's dominate market position that there are indeed some staff somewhere, but again this is largely conjecture based on inference and anecdotal responses. This fact is even clearer because when we asked Mobilink employees to quantify the number of employees working with CK, only 26% were able to mention some figures, while the remaining 74% had no any idea about how many employees are working under this department. The next part of the question asked if participants knew since Mobilink had established such a department concerned with obtaining and making use of CK. Totally, 83% of the respondents said they did not know how long these personnel or departments had been in operation at Mobilink, and only 17% percent mentioned how long Mobilink had such personnel or departments.

4.3. Results of Question 3: Does Mobilink Encourage/Motivate their Customers to Contribute to New or Better Products?

This next set of questions was designed to see if Mobilink offered any incentives to customers who are keen to share their knowledge. The results of this part of the survey did not yield adequate evidence as whether or not incentives or benefits were given to help convince customers to participate in the innovation process. For example, while 37% of the respondents said yes their company does provide some incentives, most of these 37% were not clear as to how or in what form Mobilink provided benefits or incentive to a customer, while the remaining 63% said no, and Mobilink does not provide any kind of incentive to a customer who share ideas with the company.

4.4. Results of Question 4: Where does Innovation Originate?

The purpose of this question set was found out where employees at Mobilink see innovation as originating. While this question does not specifically address where innovation comes from within Mobilink, it does help us gauge the mindset of employee working at the company, which in turn provides some insight into the company culture of Mobilink and how they see innovation as it relates to customers.

As seen in Table 3 most respondents indicated that innovations originate from inside the company, meaning that in their minds companies themselves play the primary role as innovation drivers and are the primary source of innovative ideas. Surprisingly, they seem to think that innovation from research universities play the smallest role in corporate innovation, suggesting that employees at Mobilink see a large gap between academia and the corporate

Table 3: Mobilink's source of innovation

Question	Always (%)	Often (%)	Sometimes (%)	Never (%)
Innovation happens inside a company	40	44	7	0
Innovation comes from outside the company (various sources below)				
From suppliers	3	36	43	13
From companies in the same industry	16	16	40	
From competitors	23	20	30	3
From universities or research institutions	3	37	33	23
Innovation comes from joint efforts of people from inside and outside a company	23	37	23	3

sector. This observation may be in part regional in nature. Within the US and some parts of Europe and Asia, there are closer ties between academic and business innovation. For example, the popular computer and technology manufacturing firm Lenovo was a spin-off venture of materials and electronics research of the Chinese Academy of Sciences, who is still the majority shareholder in the company.

On the whole, the responses from Mobilink show a knowledge and nascent understanding of CKM from Mobilink and its employees. The results of our survey likewise suggest that around half of those employees surveyed regard customers as a potentially important source of information, but mostly in an informal sense. By this we mean that employees consider suggestions or complaints as a beginning point in moving forward with new ideas within the company. However, in terms of formally bringing customers in-for example, to review prototypes, or to be formally offered incentives for their ideas-most employees are skeptical as to the value of such an action. On the whole, the results of our survey likewise indicate that employees at Mobilink are likely amenable to the change in mindset of viewing customers as potential innovation partners, but likely are quite passive. None of the survey responses or additional commentary seemed to indicate that employees took specific action to engage with customers or obtain information from them.

4.5. CKM Mechanisms at Mobilink

The Butterfly Model broke down the three primary divisions of CK-knowledge for customers, from customers and about customers-into more comprehensive categories represented by the three units of the butterfly abdomen representing knowledge about customers (orange), knowledge for customers (red), and knowledge from customers (green).

From the abdomen, the sub-categories radiate outwards, connecting different segments of the wing which then encompass the various CKM mechanisms that relate to both the general categories of knowledge (denoted by color) and by aspect (noted by trapezoid connecting to the abdomen). The wings that list all of the potential CKM mechanisms are bisected in half, allowing mechanisms from any category of knowledge of aspect thereof by either grouped as "Technological mechanisms" or "Non-technological mechanisms." Totally, the finalized Butterfly Model as shown in Figure 7 contained a total of 76 different knowledge gathering or disseminating mechanisms. The listed mechanisms comprise the most through listing of both technical mechanism (TM) and NTM bused in a model to date, offering unique possibilities when applied to case studies of businesses with both e-commerce and traditional modes of delivery for products and services.

Of the total 76 mechanisms outlined in the butterfly model, only 12 were not at all present at Mobilink, with a further 6 being unclear whether or not they were present. Of these CKM mechanisms, the ones not currently present largely seemed to be mechanisms that would either not fit with Mobilink's core business - as a telecom mobile service provider - or would not be as widely distributed in developing market areas. For the CKM modelling, however, each mechanism can be present in several different senses or possibilities, as these mechanisms or channels can provide different kinds of knowledge and the communication need not be one-directional.

To account for the potential variety of types of knowledge all the mechanisms may represent, we have summarized the information, identifying the sources within their corresponding categories. Bold denotes mechanisms that are present, italics represents mechanisms that may or may not be present, mechanisms that are not included are underlined for clarity.

4.5.1.Knowledge for customers

Complementary information

NTM: Idea Bank, Reports, Knowledge Map, Community of Practice, Inter Organizational Expert Council, Information Bank And Knowledge Centers. TM: News About The Company, Journal, Site Map, Drop Box, Glossaries, Account Alert, Come Visit Us, Account Preference, Company Financial Information, Employment Opportunities.

Company general information

NTM: Festival, Catalog, Call Center, Interview with Managers.

TM: Video Showing And Photos Gallery, Email The Site Of Company To A Friend, Email Reminder Alert, Press Room, About Us, Testimonials.

Company environment information

NTM: Festival, Reports.

TM: Link to Other Websites, Links to Same Groups, Product Comparison, News.

Company's products and service information

NTM: Information Bank And Knowledge Centers, Experts Questionnaires, Interview With Customers, Festival, Help Desk, After Action Review, Contact Center, Search Agents, Case Study, Congresses, Idea Bank, Call Center, Catalogue, Sessions, Reports, Kiosk, Mail.

TM: Education Information About Product And Service, Send The Product Description To A Friend, Consumer Review/ Rating Of The Product, Notification Alert, Web Seminars, Discussion Forums, Search Engine, Product Comparison, Testimonials, Electronic Help Desk, Demo Tour, News,

Follow Up Service Information, Email, Trace The Status Of Order, SMS, Listing Of Best Seller Product, Post Message, Video Showing And Photos Gallery, Bulletin Board, Product Catalog, Chat, FAQ.

4.5.2. Knowledge about customers

Prospective customer information

NTM: Organizational Documentation Forms, After Project Interview, Expert Questionnaires, Call Center.

TM: Wish List, Survey Form, Discussion Forums, Post Message/Write To Us, Post Message (Without Feedback).

Current customer information

NTM: Observation, Knowledge Updating, Organizational Documentation Forms, After Project Interview.

TM: Post Message, Survey Form, Sign Up, Cookies, Write To Us.

4.5.3. Knowledge from customers

Competitors related information

NTM: Recommended &Feedback System, After Project Interviews, Experts Questionnaires, After Action Review, Survey Form, Idea Bank, Call Center.

TM: Survey Form, Discussion Forums, Post Message/Write To Us, Customer Complaining Recording System, Consumer Review/Rating For Product And Sellers Credit Rating.

Company related information

NTM: Call Center, Recommended &Feedback System, After Action Review, Interview With Customers, Kiosk, Sessions, Congresses, After Project Interview, Expert Questionnaires, Idea Bank.

TM: Discussion Forums, Post Message/Write To Us, Customer Complaining Recording System, Consumer Review/Rating For Product And Sellers Credit Rating, Customer Satisfaction Collecting System, Personalized Product Recommendation.

Overall, the mechanisms were well-distributed across all three major types of CK, and nearly evenly divided between technical and NTM. In terms of what we can infer regarding Mobilink, these results seem to confirm the responses we received from the employees. Most employees at the company agreed that customer information could be a starting point in innovation, and it seems that there are appropriate number of mechanisms in place to gather that information. In this aspect, the flow of information is largely one-directional, from the customer directly to the company. Certainly many of the mechanisms we discussed fit this model, whereby customers can communicate knowledge about themselves or from themselves easily to Mobilink.

5. CONCLUSION

As for the six key success factors, we found most were assessable using our current mixed methodology of survey/interviews with an external model assessment. First, to what extent do firms view customers as a source of knowledge? Again, the mixed results show that Mobilink only partially succeeds by this factor. Second, to what degree do companies understand different types of CK was largely assessable by using our external assessment via the butterfly model, as this model allows us to infer what kinds of knowledge were assessed by examining which mechanisms were being looked at it. Third, the factor of to what extent do firm's consider the differences in these types of knowledge in their CKM efforts is equally answerable by the Butterfly Model, and again, it appears Mobilink largely succeeds (given the large number of CKM mechanisms at play), but characterizing it further is difficult without greater cooperation with the company directly. Fourth, does the firm adequately implement appropriate mechanisms to gather this knowledge and communicate with their customers again was assessable through the Butterfly Model, and again Mobilink largely succeeds. However, one caveat to this success factor is also tied into the next factor, of whether gathered knowledge is appropriately managed and shared throughout the company.

Our survey results showed that few employees were aware of CKM strategy at their company -and even fewer could characterize it - which helped us infer that even if a CKM strategy is in place, the knowledge it gathers is not effectively shared with other units or divisions within the company. Likewise, there is no central database through which employees can access any of this information, even if it is already gathered and stored. The final success factor was more nuanced. We argued that success of a CKM strategy can partially be gauged by exploring to what extent do CKM efforts support innovation efforts that contribute to a given company's success. Since information on innovation as connected to CK could not be assessed externally and since Mobilink would not share this information directly, we instead approached this factor via customer complaints and its relationship to market leadership. Moblink resolves the highest number of complaints (according to Pakistan Telecommunication Authority annual report) through dedicated communication with its customers (and a large variety of mechanisms available to gather this information, which may or may not be directly be CKM mechanisms) but it remains the market leader.

Since the telecom sector in Pakistan is quite competitive, we proposed a hypothesis that Mobilink's high customer satisfaction and market leadership suggest that their CRM efforts are likely part of a CKM strategy, since CKM is largely related to customers being connected with companies via CKM was linked to company success in our analytical review, as was the connection between innovation in value-added services obtained by listening to customer complaints. Mobilink largely seems to be the most innovative of the telecom companies in Pakistan, meeting many of its customer needs that its competitors does not (e.g. dedicated call service reps, regional language support, numerous telecom services, etc.). Given these assumptions, while our results cannot speak directly to innovation, we are fairly certain that whatever Mobilink's market leadership is due to, innovation (which we presume is a result of listening to customer demands) and close contact with its customers (potentially through CKM or CKM-like processes) likely play an integral role. More succinctly, this means that Mobilink's (potential) CKM strategy/processes largely succeeds based on our final success factor.

In sum, our assessment of the Butterfly Model showed that this model was successful in characterizing the general features of CKM mechanisms being currently used at Mobilink, and moreover confirms, to some extent, our hypothesis that Mobilink does have

a CKM strategy in place. Given Mobilink's leading position in the market and its high-level of resolved complaints, we can likewise infer that our other hypothesis is correct, that CKM in some way contributes to the market success of a company, and is effective at bringing information into the company. While the attitudes towards customers are open-minded, the general results of our interviews with employees at Mobilink extends our earlier conclusion by adding a key qualifier: If Mobilink does have a CKM strategy in place, which the Butterfly Model indicates is likely, then it is still in its nascent stages and not fully developed or adequately implemented.

While our research greatly extends the available information on CKM strategies via the case study we conducted on Mobilink, there are several scholarly implications regarding further study of CKM that are worth noting. The first is that the lack of openly available information from companies - as we experienced with Mobilink - makes empirical studies of CKM quite difficult.

For future CKM studies, especially those conducted externally, it is critical to understand the limited nature of information that can be gathered regarding CKM. Ideally, companies would be more open and cooperative in providing this information, but that seems unlikely in the current market. To ensure such studies are still successful without direct company data, we strongly suggest that CKM studies branch out from simply using models and begin to incorporate data from other sources, including qualitative interviews, publically published company data, and whenever possible, thorough and effective models that can externally measure CKM mechanisms that a company may currently be using. This last note, regarding the need for externally validated mechanisms, has some limitations. Most models of CKM strive for being exhaustive at the cost of being tailor-made. The missing mechanisms from Mobilink's CKM strategy were not indicative of any failures or the lack of a CKM process at the company, rather they were mechanisms that did not seem to suit our particular case study quite well.

Future studies would do well to assess the validity of each mechanism before using the existence or non-existence of a particular mechanism or group of mechanisms to draw any broad conclusions.

On a more general level, the potential shortcomings that could have impacted our research hold some insights to theoretical CKM modeling as well. Though the Butterfly Model was effective, we noted that it's "laundry list" approach to CKM mechanisms meant that it was not specifically geared to understanding a variety of different companies. In fact, to use the Butterfly Model we had to spend a great deal of time and research to find an appropriate case study. The generality of the model, while a strength in some ways, is also its greatest drawback. Future studies would then greatly benefit from either a lexicon of mechanisms at work in a particular industry or sector, which could help contextualize the necessity/irrelevance of specific mechanisms to a particular industry. By extension, this also means that the butterfly model and those like it would benefit from becoming more industry/sector targeted and annotated to reflect the heterogeneity of business types. Likewise, the butterfly model is only effective in certain business models. Since we were predominately concerned with customer KM for customer-facing firms, we sought to examine how businesses viewed their customers as potential partners, even though it was well understood that these customers had no particular experience in the field. However, customers can also be informed experts, especially among business facing businesses (i.e., those with a Business-To-Business model). In this regard, CKM does a poor job of acknowledging the diversity of potential customers that different businesses may have. The potential solution to this problem is either to enlarge the definition of the customer and seek to connect this wider definition with the general concepts of CKM, or, alternatively, to break such relationships into particular sub-fields or disciplines geared towards these types of business. The former approach may be more difficult, as it would necessitate re-thinking some of the core precepts of CKM, but the latter runs the risk of fragmenting CKM back into the original fields it sought to transcend - in effect, returning the practices and process of traditional CKM to CRM, and other types of customers being left to supply-chain management.

REFERENCES

Aghamirian, B., Dorri, B., Aghamirian, B. (2015), Customer knowledge management application in gaining organization's competitive advantage in electronic commerce. Journal of Theoretical and Applied Electronic Commerce Research, 10(1), 63-78.

Alavi, M., Leidner, D.E. (2001), Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. MIS Quarterly, 25(1), 107-136.

Bang, J. (2005), Understanding Customer Relationship Management from Manager' and Customers' Perspective: Exploring the Implication of CRM Fit, Market Orientation, and Market Knowledge Competence, Rhode Island (United States): University of Rhode Island. Doctor Dissertation. p165.

Bose, R., Sugumaran, V. (2003), Application of knowledge management technology in customer relationship management. Knowledge and Process Management, 10(1), 3-17.

Buchnowska, D. (2011), Customer knowledge management models: Assessment and proposal. In: EuroSymposium on Systems Analysis and Design. Berlin, Heidelberg: Springer. p25-38.

Croteau, A.M., Li, P. (2003), Critical success factors of CRM technological initiatives. Canadian Journal of Administrative Sciences/Revue Canadienne des Sciences de l'Administration, 20(1), 21-34.

Darroch, J., McNaughton, R. (2003), Beyond market orientation: Knowledge management and the innovativeness of New Zealand firms. European journal of Marketing, 37(3/4), 572-593.

Davenport, T.H., Harris, J.G., Kohli, A.K. (2001), How do they know their customers so well? MIT Sloan Management Review, 42(2), 63-70.

Fidel, P., Schlesinger, W., Cervera, A. (2015), Collaborating to innovate: Effects on customer knowledge management and performance. Journal of Business Research, 68(7), 1426-1428.

Gawer, A., Cusumano, M.A. (2008), How companies become platform leaders. MIT Sloan Management Review, 49(2), 28-39.

Gebert, H., Geib, M., Kolbe, L., Brenner, W. (2003), Knowledge-enabled customer relationship management: Integrating customer relationship management and knowledge management concepts [1]. Journal of Knowledge Management, 7(5), 107-123.

Gebert, H., Geib, M., Kolbe, L., Riempp, G. (2002), Towards customer knowledge management: Integrating customer relationship

management and knowledge management concepts. In: The Second International Conference on Electronic Business. (ICEB 2002). p296-298.

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.

Gunasekaran, A., Love, P.E., Rahimi, F., Miele, R. (2001), A model for investment justification in information technology projects. International Journal of Information Management, 21(5), 349-364.

King, G. (2011), Ensuring the data-rich future of the social sciences. Science, 331(6018), 719-721.

Rollins, M., Halinen, A. (2005), Customer knowledge management competence: Towards a theoretical framework. In: IEEE Proceedings of the 38th Annual Hawaii International Conference on System Sciences. p240a.

Sakhaee, N., Shahbaznezhad, H., Zanjani, M.S. (2012), A comprehensive model for customer knowledge management mechanisms. Available from: http://www.ssrn.2660769.

Soliman, F., Spooner, K. (2000), Strategies for implementing knowledge management: Role of human resources management. Journal of Knowledge Management, 4(4), 337-345.

Stefanou, C.J., Sarmaniotis, C., Stafyla, A. (2003), CRM and customer-centric knowledge management: An empirical research. Business Process Management Journal, 9(5), 617-634.

Teece, D.J. (1998), Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets. California Management Review, 40(3), 55-79.

Tsai, W. (2001), Knowledge transfer in intraorganizational networks: Effects of network position and absorptive capacity on business unit innovation and performance. Academy of Management Journal, 44(5), 996-1004.

Tseng, S.M. (2016), The effect of knowledge management capability and customer knowledge gaps on corporate performance. Journal of Enterprise Information Management, 29(1), 51-71.

Wilson, H., Daniel, E., McDonald, M. (2002), Factors for success in customer relationship management (CRM) systems. Journal of Marketing Management, 18(1-2), 193-219.

Zack, M.H. (1999), Developing a knowledge strategy. California Management Review, 41(3), 125-145.

Zanjani, M.S., Rouzbehani, R., Dabbagh, H. (2008), Proposing a conceptual model of customer knowledge management: A study of CKM tools in British dotcoms. Management, 7(8), 19.

Zanjani, M.S., Sakhaee, N., Shahbaznezhad, H. (2009), Mechanisms of customer knowledge management in e-commerce websites. Research Journal of Information Technology, 1(2), 86-93.