

Business-IT Alignment in PSS Value Networks

Linking Customer Knowledge Management to Social Customer Relationship Management

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Abstract: Offering a PSS that is based on co-creating value with customer, starts with understanding customer needs. Customer understanding is realized through the process of managing customer knowledge across a PSS value network. In this respect, customer knowledge management (CKM) is seen as a core business capability. We extend the notion of CKM capability to a PSS value network, defining it as a value network CKM (VN-CKM) capability. We also look at the supportive IT capability, which we define as the value network social customer relationship management (VN-SCRM) capability. At operational level VN-CKM and VN-SCRM capabilities are reflected in the execution of business processes and information systems. To achieve BIA, a linkage is required between the VN-CKM capability and the VN-SCRM capability and between its accompanying business processes and systems. If in the process of VN-CKM, activities such as creation, storage/retrieve, transfer, and usage of customer knowledge are enabled by VN-SCRM systems across a network, the established BIA will support the functioning of the PSS. In this study we discuss the role of a VN-SCRM capability and identify requirement components of accompanying systems in relation to a VN-CKM capability and accompanying processes, in order to foster BIA at a network level.

1 INTRODUCTION

Offering a product-service system (PSS) emerges as a new business strategy which is inherently based on collaboration within dynamic network of partners and co-creation with customers. By a PSS we mean a longitudinal relational process among multiple actors, including customers, within a value network during which they provide bundles of goods and services as an integrated solution, aimed at meeting individual customer's needs (Grönroos, 2011; Hakanen, 2014; Oliva and Kallenberg, 2003; Storbacka et al., 2013). Since IT is regarded as a technological foundation for the operations of such networks, it is essential to align IT with the business strategy and the operations of the PSS value network. According to Henderson and Venkatraman (1993) achieving business-IT alignment (BIA) requires the degree of fit between business strategy and IT strategy (strategic alignment), and between business processes and supportive concrete information systems (operational alignment). Unlike firm-level studies on BIA, network-level studies are still in their nascent phases. To remedy this, we

already have elaborated the notion of BIA for a PSS value network in which we took a capability-based perspective and claimed the status of BIA at a strategic level can be determined on the basis of an alignment between business and IT capabilities (Bagheri et al., 2014). In this paper we focus on one particular aspect of the capability-based framework, i.e. the relationship between the core capabilities of customer understanding and IT integration capabilities across a PSS value network. In order to operationalize these constructs, we introduce the notions of the customer knowledge management (CKM) capability of the value network (VN-CKM) as a relevant aspect of customer understanding capability. Also we define the social customer relationship management (SCRM) capability of the value network (VN-SCRM) as a relevant aspect of IT integration capability which is basically considered as the ability of a network to provide inter-organizational SCRM systems integration across a value network. As a result in this paper the relationship between VN-CKM capability with VN-SCRM capability (i.e. strategic BIA) as well as relationship between VN-CKM processes with a

VN-SCRM systems (i.e. operational BIA) will be discussed. This will lead to identification of required components of the supporting systems at a network level. Summarizing, this study aims to answer three research questions:

- 1) What are usable definitions of VN-CKM and VN-SCRM?
- 2) How can we investigate alignment at network level in the area of VN-CKM and VN-SCRM?
- 3) What are the required components of VN-SCRM systems at the network level?

This study contributes to the emerging literature on BIA research in a context of PSS value networks in twofold: Firstly, we elaborate the notions of CKM and SCRM at a network-level. Secondly, we focus at BIA by investigating the relationship between VN-SCRM and VN-CKM as one of the main aspects of BIA in the context of PSS value networks. The outline of the paper is as follows. Current work is discussed in section two. Section three describes the research approach. Section four develops definitions for VN-CKM capability and processes and for VN-SCRM capability and systems, while section five answers questions two and three. The final section presents conclusions and indicates directions for further research.

2 CURRENT WORK

Customer knowledge is considered as a prerequisite for customer understanding. By acquiring and managing customer knowledge, organizations can better understand customers' characteristics, needs, and preferences (Weng et al., 2012). Customer knowledge can be classified as knowledge "for", "about", and "from" customers (Bueren et al., 2004; Salomann et al., 2005; Gebert et al., 2003; Su et al., 2006; Gibbert et al., 2002; Smith and McKeen 2005).

- (1) Knowledge "for" customers is required to satisfy knowledge needs of customers such as knowledge about products, suppliers, and markets in order to make better purchase decisions.
- (2) Knowledge "about" customers is accumulated to understand motivations of customers and to address these in a product. This includes customer history, connections, requirements, expectations, and purchasing activities (which is domain of traditional CRM systems).

- (3) Knowledge "from" customers represents knowledge residing in customers. By direct interactions with customers this knowledge can be gathered to feed continuous improvement, e.g. service improvements or new product developments.

Nowadays the knowledge flow between a firm and its customers changes from a unilateral direction from firms to customers (i.e. "for", "about") or customers to firms (i.e. "from"), to a bi-directional relationship through productive dialogue and cooperation of a company with its customers for mutual benefits and joint value creation, which is called knowledge co-creation "with" customer (Buchnowska, 2011; Skotis et al., 2013; Smith and McKeen, 2005).

A customer knowledge management (CKM) capability has been introduced as a strategic capability of an organization to employ an ongoing process of creation, storage / retrieval, transfer, and usage of customer knowledge with an emphasis on a bi-directional interaction between firms and their customers to the benefit of both customer and firm (Belkahla and Triki 2011; Buchnowska, 2011; Gibbert et al., 2002; Lin, 2007; Lin et al., 2006; Skotis et al., 2013; Zhang, 2011). These processes improve a firm's ability to identify real customer needs (Belbaly et al., 2007).

While a successful CKM initiative requires support from people, processes and information systems (Khodakarami and Chan 2014; Liberona et al., 2013; Tanriverdi, 2005) we concentrate in the BIA context on the technological enabler. In this respect, customer relationship management (CRM) systems which are nowadays enhanced by social media applications- known as social CRM (SCRM)- can facilitate customer knowledge processes. In fact SCRM provides greater access to customer experience and knowledge (Trainor et al., 2014). However, there is no consensus within academia on the definition of SCRM. In different definitions various perspectives are being used, such as a process, a strategy, a philosophy, a capability, and a technology-based perspectives (Faase et al., 2011; Greenberg, 2010; Küpper et al., 2014; Trainor et al., 2014; Zablah et al., 2004; Reinhold and Alt 2013). An example of a definition is: a SCRM capability is the ability of a firm to integrate traditional sale-and marketing-centric CRM systems with emergent social media applications, to engage customers in collaborative conversations and enhance customer relationships (Trainor et al., 2014). Additional features of social CRM such as social networking, two-way communication, interactive relationship,

and user-generated content enables a SCRM capability to provide support for the management of co-creation knowledge with customers (Kärkkäinen et al., 2011; Küpper et al., 2014; Skotis et al., 2013); (Kärkkäinen et al., 2011; Küpper et al., 2014; Skotis et al., 2013).

So far the existing theories on CKM and SCRM capabilities have been restricted to a firm-level setting, where a single firm aims to achieve a desired improvement or innovation in its products through the co-creation with customers, is not tailored to the specific situations of PSS value networks. The PSS value network is based on a customer-centric view on the co-creation of integrated solutions where multiple actors (including customers) collaborate with each other, based on their core competencies and sharing their knowledge and resources to provide customized offerings (Gebauer et al., 2013; Lusch and Webster, 2011; Peppard and Rylander, 2006). Therefore, the provision of integrated solutions requires a shared understanding of all actors about the customer problems and expectations (Hakanen and Jaakkola 2012). Moreover, solution providers are dealing with the customer process, i.e. the so-called value-in-use, and as a consequence value networks have to understand customer business activities where customers are actively involved in this process (Jaakkola and Hakanen, 2012). According to these characteristics of a PSS value network we can conclude that at a network-level, it is necessary to take into account collaborative and relational aspects to define SCRM and CKM in order to make them applicable across the network. In doing so, we extend the notions of CKM and SCRM into the PSS value network respectively name as value network CKM (VN-CKM) and value network SCRM (VN-SCRM). In addition we will discuss the relationship between VN-SCRM and VN-CKM which will contribute to BIA literature at a network level.

3 RESEARCH METHODOLOGY

This section discusses the research methodology that has been followed when answering the two research questions. While prior firm-level studies on CKM and SCRM can serve as a foundation for this research, their definitions and characteristics need modification to be applicable within a PSS value network environment. Therefore to answer the first question, a structured literature review has been carried out to derive the basic definitions of CKM and SCRM. Due to multidisciplinary nature of the

topic, journals in the field of MIS, knowledge management and marketing are reviewed by using keyword terms such as customer knowledge management, social CRM, knowledge management, customer understanding, social media, and CRM. The literature search process consists of two main activities. First a generic search was used to identify a number of well-known and well referenced authors of papers on CKM and SCRM capabilities within scientific databases. Second relevant papers were used in a backward (i.e. looking at papers cited) and forward (i.e. looking at papers citing the paper) snowball process. The search processes resulted in the collection of relevant papers which we analysed to identify the main aspects of CKM and SCRM definitions. Then, we adapted them in accordance with the identified characteristics of a PSS value network. The proposed definitions of the VN-CKM and VN-SCRM are discussed in the next section.

Regarding the second research question, to achieve BIA the incorporation of a strategic and operational level is required. While BIA at a strategic level deals with decisions regarding the key capabilities, the operational level is concerned with processes and supportive information systems (Henderson and Venkatraman 1993; Maes et al., 2000). As illustrated in figure 1 we will look at a relationship between VN-SCRM and VN-CKM capabilities at a strategic level. At an operational level these capabilities are reflected in VN-CKM processes and VN-SCRM systems, so we investigate the supports provided by different SCRM systems in VN-CKM processes.

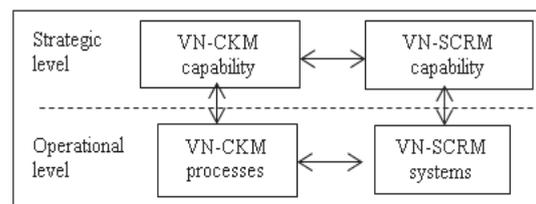


Figure 1: Research framework on BIA.

Since both aspects of BIA have received no sufficient coverage in a PSS value network context, we review firm-level studies that will provide a basis for further discussion at a network level. Then applying the novel network-level perspectives on CKM and SCRM enables us to derive the possible linkages between the VN-SCRM capability and systems in the VN-CKM capability and processes. As a result we propose a theoretical relationship between them. Regarding strategic BIA we argue that for VN-CKM as a type of business capability

the VN-SCRM capability is an appropriate IT capability. We will discuss this in detail in section five. Regarding operational BIA, we need to understand the role of VN-SCRM systems in the processes of creation, storage/retrieval, transfer, and usage of customer knowledge. If different VN-SCRM systems provide support for these processes across the value network, the established BIA results from a relationship between VN-SCRM systems and VN-CKM processes is likely to contribute to co-creating integrated solutions.

4 DEFINITION DEVELOPMENT

Here we define the VN-CKM and VN-SCRM and discuss the novel aspects of our definitions.

4.1 VN-CKM Capability and Process

We define the value network customer knowledge management capability (VN-CKM) as *a strategic capability of a value network to collaboratively employ an ongoing process of creation, storage/retrieval, transfer, and usage of the value network knowledge “with” customers that is applicable across the value network with emphasis on bi-directional interaction of multiple actors with customers, to all actors and customers benefits.* This capability facilitates a shared understanding of customers’ needs among actors which in turn results in the creating of superior solutions “with” customers. Comparing this with the aforementioned definition of the CKM capability at firm-level the novel aspects of our definition are:

- 1) Collaborative attempts of all actors in the CKM processes take place across the network. In fact doing joint activities is the fundamental premise of any PSS value networks.
- 2) We highlight the concept “value network knowledge with customer” which goes beyond the two-actor focus (in previous definitions of knowledge with customer) and moves to a multi-actor network focus. It is derived from the productive dialogue and interaction of multiple actors with customers.
- 3) The CKM processes across the network reflect an ongoing process of learning and experience sharing of all actors with customers, in order to create a shared understanding of the customer’ needs across the network which in turn reflects the customer-centric premise of a PSS value network.

To define the activities of the VN-CKM process we modified the general definitions of the knowledge management process as proposed by Alavi and Leidner (2001) in accordance with the main characteristics of a PSS value network in which all actors collaborate in such a process.

The value network customer knowledge (VN-CK) *creation activity* involves the development of new contents or replacing and updating the network’s existing knowledge related to the customer, in collaboration with all actors.

The VN-CK *storage/retrieve activity*, also called the network memory, includes the process of making the customer knowledge persistent and then supporting quick access to them across the network.

The VN-CK *transfer activity* refers to the process by which the value network shares customer knowledge among actors through interactions that take place among them. This process mainly deals with problem solving process (Scherp et al. 2009) where customers or other actors get their feedback and suggestions to collaboratively solve a problem.

The VN-CK *usage activity* refers to the process of the actual usage of customer knowledge across the networks for the co-creation and the tailoring of their offerings to the specific requirements of a customer.

4.2 VN-SCRM Capability and Systems

We define the value network social customer relationship management (VN-SCRM) capability as *a capability of a value network to integrate traditional heterogeneous sale-and marketing-focused CRM applications and data with emergent social media applications and data distributed in a PSS value network to engage customers in collaborative conversations and enhance the customer relationship.* This capability enables a value network to create customer relations at a network level and support both transactional and relational customer-faced processes among actors. Comparing with the aforementioned definition of SCRM capability the novel aspect of our definition is:

This capability of a network is mainly dealing with inter-organizational SCRM systems integration at both an application and a data level (Bagheri et al., 2014). Because customer-facing activities are distributed across different actors, they have to be integrated. Moreover, integration of heterogeneous SCRM applications and data across a network is required to reach sufficient customer information exchange between actors and to support the

collaborative customer-facing processes. As a result all actors may instantly share their data and jointly manage customer knowledge. This integration enhances the visibility of the information throughout networks which enables appropriate respond to the customer demand (Hadaya and Cassivi, 2007).

Meanwhile, derived from general categories of CRM systems we introduce three types of systems provided by the VN-SCRM capability includes analytical VN-SCRM, operational VN-SCRM, and communicative VN-SCRM systems (Gebert et al., 2002; Geib et al., 2006; Karimi et al., 2001; C.-T. Su et al., 2006; Khodakarami and Chan, 2014). While analytical VN-SCRM systems are used for the building of data warehouses and analysing both transactional and social media data among actors operational VN-SCRM systems are used for the incorporation of social media tools into cross-organizational business processes of customer service, marketing and sales activities among actors. Communicative VN-SCRM systems are generally used to manage and integrate customer interaction touch points among actors. We state that Success of the next generation SCRM systems will depend upon integration of not only social media data and applications with traditional CRM system within standalone firm but also integration of such data and applications across inter-organizational boundaries (VN-SCRM). There are several configurations and technical designs scenarios to support inter-organizational information system integration. Meanwhile the interoperability of diverse SCRM application as well as data compatibility issues also need to be considered in any attempt to develop integrated SCRM systems across a PSS value networks.

5 ALINGING VN-CKM AND VN-SCRM

To achieve both strategic and operational BIA here, we discuss the alignment of the VN-CKM capability and the accompanying process with the VN-SCRM capability and the accompanying systems.

Regarding strategic BIA, we argue that for the VN-CKM capability the VN-SCRM capability is an appropriate supportive IT capability. Because according to our definitions in section four, on one hand the VN-CKM as a customer-centric business capability aims to co-create customer experience, on the other hand the VN-SCRM capability as the ability of a network to integrate SCRM systems

among actors aims to facilitate customer knowledge management across the network. Such customer knowledge helps value network address customer needs in co-creation integrated solution as a desired goal of VN-CKM capability.

Regarding operational BIA, in order to understand the possible supports provided by VN-SCRM systems in the process of VN-CKM, we first briefly overview the research streams within a firm-level environment on supports provided by CRM/SCRM systems in CKM processes and support of social media tools on CKM process and knowledge management process in general which is also summarized in table 1. Regarding the contribution of CRM in CKM processes, Khodakarami and Chan (2014) investigated the relevant studies in this field and then examined the possible support provided by the different types of CRM systems, including analytical, operational and communicative systems for different types of customer knowledge. They determined the level of support that these systems provide for knowledge creation processes, as well as the type of customer knowledge that they are well suited to create, based on the systems' capabilities and functionality. Xu and Walton (2005) develop a conceptual model to show the role of analytical CRM system for customer knowledge acquisition. In the framework proposed by Ranjan and Bhatnagar (2011) the role of analytical, operational and communicative CRM systems are examined to provide support for different types of customer knowledge. The whole process of customer knowledge creation, storage, dissemination and usage is managed on the basis of the framework.

While many studies have focused on the contributions of new emerging social media tools to the knowledge management process (Panahi et al., 2012; Avram, 2006; Levy, 2009; Scherp et al., 2009), studies on the applicability of SCRM for facilitating customer knowledge process are still in progress. Since research in the field of SCRM is still in progress, previous studies have been mostly dealing with the question such as how to integrate customer-centric functionalities provided by social media applications in the traditional sales- and marketing-centric CRM system in order to get additional value of SCRM in CRM processes (Alt and Reinhold, 2012; Trainor, 2012). Skotis et al., (2013) in their conceptual work discuss on how emergent social media tools and networking technologies facilitate CKM processes with more emphasis on knowledge co-creation with customers. Chua and Banerjee (2013) by doing case study

Table 1: Review of similar studies at firm-level setting on supports provided by CRM/SCRM systems or social media applications in KM or CKM processes.

Study	Topic			
	CRM/SCRM	Social media	KM	CKM
Xu and Walton (2005)	Analytical CRM	N/A	N/A	Knowledge about customer acquisition
Khodakarami and Chan (2014)	Operational, communicative and analytical CRM systems	N/A		Customer knowledge creation cycle, Knowledge for/from/ about customer,
Ranjan and Bhatnagar (2011)	Operational, communicative and analytical CRM systems	N/A	N/A	Knowledge for/from/ about customer, CKM process
Torioni and Angeloni (2011)	Operational, communicative and analytical CRM systems	N/A	Knowledge creation cycle	N/A
Panahi et al., (2012)	N/A	Characteristics of social media	Tacit knowledge sharing	N/A
Avram (2006);Ray (2014); Scherp et al., (2009)	N/A	Weblogs, wikis and social networking applications	KM process	N/A
C.-T. Su et al., (2006)	Operational, communicative and analytical CRM systems	N/A	N/A	Knowledge for/from/ about customer
Zhang (2011)	N/A	General SM applications	N/A	General knowledge
Kärkkäinen et al., (2011)	N/A	General SM applications	KM process	Sharing and creation of customer knowledge
Skotis et al., (2013)	N/A	General SM applications	N/A	CKM process
Chua and Banerjee (2013); Boateng (2014)	N/A	Microblog, social networking , location-aware mobile system, corporate discussion forum	N/A	Knowledge for/from/ about customer
Shang et al., (2011)	N/A	Various Web 2.0 applications	Knowledge creation cycle	N/A
Levy (2009)	N/A	Blogs, Wikis, RSS, social tagging, social networking	KM theory	N/A
Shaw et al., (2001)	Analytical CRM (data mining)	N/A	KM process	General knowledge
Durgam and Sinha (2014)	SCRM activities	N/A	Knowledge creation cycle	General knowledge

research investigated the extent to which the use of social media can support customer knowledge management (CKM) in organizations. More recently Durgam and Sinha (2014) by conducting four case studies explain how SCRM activities can be prolific in organizational knowledge creation cycle.

These firm-level studies show that CRM/SCRM systems and social media applications provide supports for managing customer knowledge process.

We believe that the logic behind such supports - after modification based on novel characteristics of PSS value network- is also applicable in the context of this research. Regarding novel aspects of VN-CKM (i.e. co-creation knowledge with customer and joint customer knowledge management activities of

all actors within a dynamic and agile PSS value network environment), required components of VN-SCRM systems which aims to provide support for VN-CKM processes across the network are discussed.

VN-CK Creation Activity: Analytical VN-SCRM systems have to be able to analyse both structured and unstructured customer data distributed in a network in order to support the customer knowledge creation activity. Most of current analytical applications such as data mining and data warehousing are aimed at serving individual firms (Rizzi 2012). Dynamic situation of PSS value network requires innovative approaches to provide

integrated analytical SCRM system. We state that the development of collaborative business intelligence, such as data warehouse integration, social media monitoring and mining, sentiment analysis, text mining, and social Business Intelligence, enable analytical VN-SCRM systems to provide a collaborative basis for a customer knowledge discovery among actors. Communicative VN-SCRM systems also provide support for VN-CK creation activity if they can provide integrated customer interaction channel among actors (e.g. PSS value network social portal) through which customers can share their idea and experience and actors are able to communicate customers' needs. Thereby the integrated communicative SCRM systems across a network will support social interaction and learning, conversation, and content creation which in turn facilitate the process of collaborative customer knowledge creation among actors and also co-creation knowledge with customer.

VN-CK Storage/Retrieve Activity: given support for this activity, analytical and operational VN-SCRM systems have to develop integrated customer knowledge repository and shared database (both structured and unstructured data) among actors respectively. In fact the shared databases of operational VN-SCRM- that incorporate both social media and transactional data distributed in the network- provides a basis for analytical VN-SCRM to extract useful information and combine and store it in a customer knowledge repository of the network.

VN-CK Transfer Activity: communicative VN-SCRM systems require having rich transferring channels such as PSS value network discussion forums to offer opportunities for sharing customer knowledge and enabling involved actors to give their suggestions on customer problems and discuss on them (Scherp et al., 2009). Co-learning from customer knowledge sharing leads value networks to enhance their solution offerings.

VN-CK Usage Activity: analytical VN-SCRM systems require developing social network-based expert systems to facilitate customer knowledge usage by actors which in turn reflects in integrated solutions.

The above mentioned proposed components of each type of VN-SCRM systems represent basic building blocks of integrated SCRM systems across a PSS value network in order to provide support for VN-CKM processes.

6 CONCLUSIONS

Business-IT alignment (BIA) can be discussed from a capability point of view. This paper seeks to provide further insights into BIA in a PSS value network environment by looking at one particular aspect of BIA, i.e. the relationship between the VN-CKM capability and accompanying processes and the VN-SCRM capability and accompanying systems. In doing so, first we elaborate the notion of VN-CKM capability as a type of business capability and its accompanying processes and the notion of VN-SCRM capability as a type of IT capability and its accompanying systems. Second, to derive BIA we looked at the relationship between VN-CKM and VN-SCRM at both a strategic and an operational level. Regarding strategic BIA, in order to achieve the desired aim of a PSS value network, i.e. co-creation integrated solution, aligning the VN-CKM capability with the VN-SCRM capability is required. At an operational level, if in the process of VN-CKM, activities such as creation, storage/retrieve, transfer, and usage of customer knowledge are enabled by integrated SCRM systems across a network, the ensuring business-IT alignment (BIA) is likely to contribute in the co-creation of solution offerings. In doing so, the required components of analytical, operational, and communicative VN-SCRM systems are defined.

This paper provides a theoretical foundation for the next step of our research in which the practical applicability of the proposed constructs, and the supports provided by VN-SCRM capability and systems in VN-CKM capability and processes will be examined through case studies. Here, we only consider strategic and operational aspects of BIA, future study should also consider structural and social aspect of BIA within such a complex context.

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