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Knowledge Management in Value Creation Networks: Establishing a New Business Model through the Role of a Knowledge-Intermediary

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Abstract

The spatial distribution and growing granularity of value chains within manufacturing networks increase the complexity of inter-organizational value creation processes and pose new challenges for their coordination and a common innovation development. “Knowledge” is the essential resource to cope with this complexity. However, in an inter-organizational context conflicts between knowledge management objectives and general management objectives can arise, which have to be compensated. The presented article describes the role of a knowledge intermediary, which represents a support function within value creation networks. The intermediary supports value creation structures, processes and the artifact, which ensure an appropriate symbiosis between knowledge management objectives and general management objectives.

Keywords: Knowledge Management; Co-operation Networks; Value Co-Creation; Innovation and Value Creation; Distributed Manufacturing

1. Introduction

The success and competitive ability of value creation networks depend on the ‘productive knowledge’ that is available during the inter-organizational value creation processes [1,2]. Productive knowledge refers to the cognitive ability of transferring knowledge into actions (or using knowledge appropriately in a specific context) [3]. The single actors within a network have only a limited capacity to accumulate productive knowledge due to the complexity and diversity of knowledge stocks [4]. Thus, the single actor (or enterprise) focuses on his core competencies and outsources secondary and tertiary business processes [5]. Knowledge, which has been created in the company over years and decades, is distributed to autonomous partners and becomes intransparent and often not directly accessible. This results in a spatial distribution of knowledge carriers and value creation processes [6].

The increasing granularity of value chains does not only result in a growing intransparency, it also reflects the increasing complexity of the product development process. This complexity poses new challenges for the design and coordination of inter-organizational value chains [7,8].

Knowledge Management (KM) sets the preconditions for the solution of complex problems evolving in the context of the (re-)integration of distributed, single operations into efficient inter-organizational business processes within the network [9]. The common potential of the actors can be best exploited through a (re-)aggregation of the spatially distributed knowledge resp. the relevant experts [10,11].

2. Knowledge Management within the regional aeronautical cluster Hamburg Aviation

The actors of the aeronautical cluster in Hamburg (Hamburg Aviation) are currently facing that exact challenges. The exceptional density of factors of production within the cluster offers great potentials for collaborative problem-solving and innovation. Although cluster initiatives are established to actually meet the growing complexity of inter-organizational value creation, the inter-organizational cooperation activities are assessed as insufficient by many of the aeronautical clusters’ actors. Even though the potentials of an efficient management of the common resource ‘knowledge’ [12] are recognized, there seems to be a lack of ability to put them into practice.

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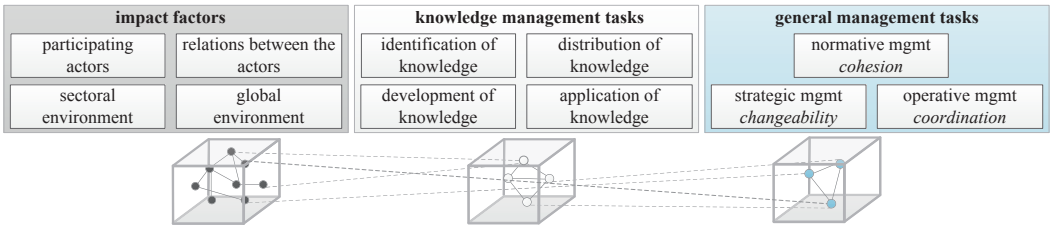

Fig. 1 Schematic illustration of the interdependencies between different areas of influence, KM tasks and GM tasks

Within the framework of a BMBF (Federal Ministry of Education and Research) sponsored research project a Knowledge Management Systems (KMS) has been developed for the aeronautical cluster in Hamburg. Correspondingly, the developed KMS supports the cooperation of the clusters' actors by enabling them to manage the common resource 'knowledge' efficiently following the overall aim of optimizing the harmonization of value chains as well as fostering collaborative innovation in the cluster.

The regional cluster initiative Hamburg Aviation (HA) consists of the core companies AIRBUS and LUFTHANSA Technik, Hamburg Airport, several associations, research institutes and universities, as well as 300 small and medium-sized enterprises (SMEs), which are linked both vertically and horizontally with one another.

Grasping and mastering the complexity of the various and constantly changing forms of cooperation within a value creation network (i.e. HA) cannot be achieved through a constructivist approach, which aims at a rather static system. Instead of order, determinism, deduction and stasis, the analytical framework has to focus on indeterminism, sense-making and the openness towards change [13]. That also means that the solution is not necessarily linked to a series of mathematical conditions, but rather to patterns of emergence, which provoke further changes.

„Theory in turn becomes not the discovery of theorems of undying generality, but the deep understanding of mechanisms that create these patterns and propagations of change." [14]

3. Requirements for inter-organizational KM

Based on the exposed premises, a systemic analysis for a deeper analytical understanding of the interdependencies between the single elements of the system *Hamburg Aviation* is required [15]. This analysis serves as a fundament for the subsequent deriving procedure of the KMS. In a first step, the effects of context-specific impact factors (e.g. level of trust, power asymmetries along the value chain) on the realization of the KM tasks as well as the realization of the general management tasks (GM tasks) in the course of cooperation are detected (see figure 1). Major tasks of the KMS are composed of the identification, distribution, development and application of knowledge [16]. The organization and regulation of the system (GM tasks) can be divided into the domains of operational management (coordination of the value creation processes), strategic management (securing the changeability) and normative management (ensuring cohesion) [17,18].

Within interdisciplinary workshops a qualitative model has been developed based on a method by NEUMANN/ GRIMM that describes the interdependencies between context-specific impacts on the realization of the KM as well as the GM tasks in detail [19]. The development of the model is based on a qualitative interview study, which has been carried out with experts of the different sectors of the aeronautical cluster [20,21].

The qualitative model allows us to identify key impacts on the realization of KM and GM tasks [22]. Moreover conflicting factors can be extracted that have an opposing impact (i.e. positive impact on KM tasks; negative impact on objectives of the GM tasks). Figure 2 shows an extract of the key impacts on 'knowledge development' and the 'ensuring of cohesion' as an objective of the normative management as well as the identified conflicting factors "autonomy" and "heterogeneity".

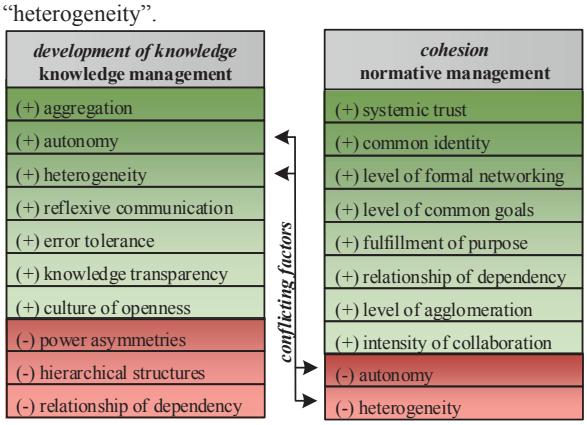

Fig. 2: Conflicting factors between 'development of knowledge' and 'cohesion'

Based on a comprehensive analysis of the key impacts within these two fields (KM and GM tasks) three central conflicts have been identified between KM and GM tasks. Though an entire resolution of these conflicts is never possible and also not aspirated, it is necessary to establish an appropriate, context-specific compensation (see figure 3). Accordingly, three major requirements for the knowledge management were derived:

(1) Compensation between cognitive proximity and distance: Cognitive distance (resp. proximity) refers to the degree of similarity of mental models, i.e. their structure and content. A high degree of autonomy and heterogeneity usually comes along with a certain cognitive distance between the actors and is the fundament for high problem solving skills of