

FRAMING KNOWLEDGE IN BUSINESS CONTEXT

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Abstract: In the competitive battle, organizational ability to create knowledge and transform it in innovations becomes crucial for success. This paper explores the links between knowledge and innovation. It contributes to understanding the role of knowledge within a firm by introducing a new model of knowledge – innovation life cycle – and discussing its implications for companies.

Key words: Knowledge, co-creation, innovation, model

1. INTRODUCTION

Knowledge is usually not created at one place or by one company. It is dynamic and created in “a dialectical process, in which various contradictions are synthesized through dynamic interactions among individuals, the organization, and the environment” (Nonaka & Toyama, 2002). Knowledge is co-created through its life cycle. The right way to manage knowledge in its life cycle is an important strategic challenge for companies. This challenge is difficult, and firms find themselves in a position where their most critical resource, that is, knowledge is, at the same time, most difficult one to manage.

The objective of this paper is to provide a greater understanding of the knowledge – innovation links through a new model. It uncovers the missing elements and leads to better understanding of the role of knowledge within a firm.

The following part of the paper describes the model and examines the links between knowledge creation and innovation. It introduces the concepts developed as a part of the first author’s PhD thesis.

2. LINKING KNOWLEDGE AND INNOVATION

2.1 Model Description

The links and interdependences between knowledge and innovation can be represented by the “House of knowledge” model. The model describes not only how new knowledge is created through interactions and feedbacks, but also how different pieces of knowledge (new and old) become combined in new ways to produce innovations. Along the model, knowledge progresses through five stages (Figure 1): knowledge creation (point A), competitors’ knowledge co-creation (B), inter-industry knowledge co-creation (C), user-producer knowledge co-creation (D) and user-user knowledge co-creation (E). The stages of knowledge creation are linked by innovation loops – invention (arrow line between A and B), innovation as creation (dashed line between B and C), innovation as adoption (lines between B to C and between C and D) and innovation as optimization (line between D and E).

At the same time, the model explains the connection between slow and fast changing knowledge (Tekic et al., 2009). Knowledge starts its dynamic transformation from slow changing knowledge (A), accelerates through the first two stages reaching its maximum “speed” at stage three (C). Then it

slows down through the stages four and five, ending again as slow changing knowledge (E).

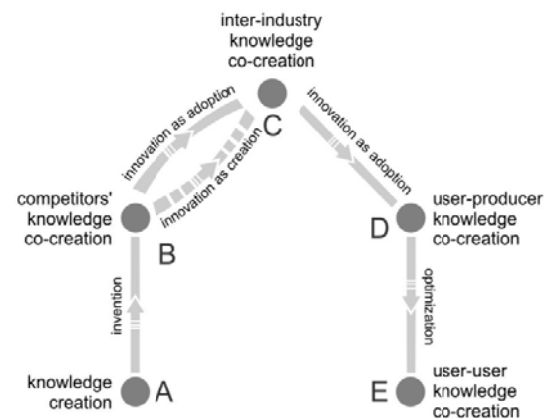


Fig. 1. House of Knowledge – Knowledge-Innovation Cycle

2.2 Stage One - Knowledge Creation

Research and creativity, coupled with subjective insights and intuition, generate a new knowledge. At the beginning, it is nothing more than an idea in someone’s head – old craftsman, a scientist in R&D department or a management consultant. At this point, the idea may be abstract, hard to fully describe and articulate. Sometimes, it is not even well understood by the individual who initiated it. However, it offers a room for testing – in a laboratory by the scientist, or in conversations with a client by the consultant. This is the first stage in our model (point A at Figure 1). Many ideas at this stage will run into dead ends or fail to generate interest, but some will become more clearly formed and make it to the next stage.

2.3 Invention

An invention (line between points A and B at Figure 1) is the first embodiment of newly created knowledge and the next step in the knowledge production. Inventions are the materialization and codification of research activities. They present ideas, sketches or models for a new product or process, that often can be patented. Invention however, stops short of commercial use or exploitation. Only a few inventions will make it through this stage (and become innovations).

2.4 Stage Two - Competitors’ Knowledge Co-Creation

While tangible property can only be in one place at one time, knowledge, especially when codified, can be used in multiple places at one time without reducing the original. This makes the usage of the knowledge easy because other interested parties can easily utilize the invention without awareness of the creator. Shortly after the first codification of knowledge (e.g.: patent application or scientific publication) or even before that, by means of business intelligence or work force mobility, competitors will become aware of the new knowledge. When the knowledge becomes known to competitors, knowledge

creation quickly becomes competitors' knowledge co-creation (point B at Figure 1). Many companies are involved in building knowledge stakes from this point forward.

As a result of competitors' knowledge co-creation, the new ideas have more solid ground to be embodied in a new product/service, or a new process. Synergy of efforts and resources brings them closer to the market. Here the challenge is in using new knowledge and recombining it with existing in different ways in order to secure the commercial success.

2.5 Innovation as Creation

Innovation as a creation (dashed arrow line between points B and C at Figure 1) brings changes in non-incremental fashion to the things that an organization offers, the ways in which they are created and delivered, as well as the context in which they are introduced. Innovation as a creation relies on explorative learning which captures creativity, experimentation, play and discovery to create knowledge (March, 1991). It creates new knowledge with potentially high but uncertain returns. These are the basis of radical innovations.

However, products are rarely "new to the world" and the innovation process is mainly about optimization and getting the bugs out of the system. This fact underlines the importance of continuous improvement and learning through adaptation.

2.6 Innovation as Adaptation

Innovation as adaptation (solid arrow lines between B and C and between C and D at Figure 1) refines and extends an established knowledge by adopting existing knowledge patterns to the current situation. It improves quality and productivity through sustained incremental change. Improvement occurs in individual components, but the underlying core design concepts, and the links between them, remain the same. Innovation as adaptation intends to circumvent or eliminate a technical difficulty in manufacture or to improve services; to saving inputs; and, to improve the conditions of work.

Continuous incremental problem-solving is based on exploitative learning, which draws on existing knowledge to make full use of what is already known, generating incremental knowledge with moderate but certain and immediate returns (March, 1991). This process of adaptation leads to incremental innovations through repeated interactions with the environment.

Innovations rarely involve dealing with a single technology or market but rather a bundle of knowledge which is brought together into a configuration.

2.7 Stage Three - Inter Industry Knowledge Co – Creation

Outside sources of knowledge are often critical input for the knowledge creation and innovation processes. It has already been argued that knowledge created by one firm can be used by another without compensation or with compensation less than the value of the knowledge. However, in this point in the knowledge – innovation cycle, it is important to understand that knowledge created in one industry can be successfully applied in other(s) and lead to competitive advantage. The Inter-industry knowledge co-creation is a process where knowledge from different industries converge and make impact on each other. Knowledge intersection and knowledge convergence are at the heart of knowledge creation process at this stage. It results in application of already existing solutions from other industries, their creative imitation, adaptation and reinterpretation in order to meet the needs of the company's current market or products.

2.8 Stage Four - User-Producer Knowledge Co-Creation

Users are seen as an important source of knowledge creation and innovation (Von Hippel, 1988). As active players in the knowledge co-creation game, they are engaged in testing, designing, disseminating or even co-producing new products and services. The interaction user – producer is central at this

stage. It results in a new knowledge creation based on the experience the customer has during the relationship. Understanding this knowledge and user learning experience is crucial for value creation and successful long term relationship.

2.9 Innovation as Optimization

Knowledge created at previous point and recombined with the large stack of existing knowledge is the basis for innovation as optimization. The task here is to search for an optimum in a well structured space of solutions (knowledge). Efficient and robust search methods for identifying optimal solutions are based on extracted consumer (market) knowledge. These processes of optimization are dominated by exploitative learning which brings refinement, efficiency, execution (March, 1991), and therefore subsequent incremental innovation.

2.10 Stage Five - User-User Knowledge Co-Creation

At its final point, the user – user interaction generates new knowledge. The dynamic communication and networking supported by the Internet and comprehensive globalization results in a fundamental change in the perception of the knowledge created in the user – user interaction. It is difficult to estimate the power of 40 million consumers networked with each other, who share their experiences and create the finest market knowledge. However, it is easy to understand that this knowledge is the key for securing competitive advantage at the last stage of knowledge – innovation cycle.

3. CONCLUSION

In this paper we described House of Knowledge model, linking knowledge and innovation. Different firms know how to do different things in different ways. Their success depends on how much they "know" and how well they explore what they "know". Understanding different processes and stages in the knowledge development is a way towards the ability to create and utilize unique, valuable, difficult to imitate, and difficult to substitute knowledge (Teece et al., 1997). The outlined model contributes to understanding the way in which firms recognize and access to knowledge in order to mobilize and utilize the knowledge to produce a product, service or new knowledge. The application of the model should help in choosing the right knowledge management tools at the specific stage of the knowledge-innovation cycle, which is crucial for achieving sustainable results.

The limitations of our research are inherent to modeling task and need to balance degree of generalization based on available research sample size. Therefore, further research should explore recognized links and support model validity through case study evidence.

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