

# Chapter II

## Interoperability Concept Supporting Network Innovation

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### ABSTRACT

*Innovation capability in creating new offering and new business models by distributed communities is becoming more important. Competitive advantage can be achieved by knowledge communities. Increasing share of the innovation process is taking place outside the company. This is due to **increasing complexity** of products and services containing multiple technologies that are not developed inside the company. Also shortened product life cycle and time to market force companies to focus on their key technologies and looking for partners to cover the supporting technologies. This interdependency organizes companies to the networks where innovation capability success is emerging property of the network. This chapter is focusing on interoperability and providing a concept in order to speed up common innovation of the products and services in open **semantic infrastructure**. This includes identification of solution boundaries and innovation partners. Operative challenge is how to decompose the requirements across the boundaries of different companies in different branches and in different role in the value and innovation network. There is also challenge on how to manage evolving technologies to satisfy customers' existing and future expectations.*

### INTRODUCTION

**Knowledge intensive business** is in continuous **co-evolution**. Nowadays competitive advantage can be achieved by open innovation in **knowledge communities**. Increasing share of the innovation process is taking place outside the company. In

the global scale the information is available anywhere when there is internet connection available. The community shares the same information at the same time. The question is how to integrate and synchronize knowledge, technology, competences, and processes, especially when making something new.

Shortened product life cycle and time to market force companies to focus on their key technologies and looking for partners to cover the supporting technologies. Innovation is not only developing new technology and capabilities, but it is also connecting existing capabilities in creative new way. Network environment is a platform for making the connections efficiently.

**Complexity** is increasing when number of elements to be managed and the connections are increasing. If the network is concentrating around the one strong company where number of smaller companies is in close relationship, the participating companies can partly adopt the leading partner's processes. This is typical in manufacturing industry. If the network is peer to peer type having similar size of the companies, where no one is taking the leading role, the question is what mechanism is then leading the network in order to focus on right things.

The interdependency organizes companies to the networks where innovation capability success is **emerging property** of the network. Innovation needs a focus that is provided by flow of requirements in the network. The requirements are understood as an explicit semantic description derived from the end customer's existing and future needs across the boundaries.

Innovation collaboration in open network environment is efficient if the network have common **semantic infrastructure, knowledge interface**, and network processes. Together this creates dynamics that activate the network to innovate. Knowledge is increasing in the network by learning process on every boundary. The **management of complexity** on boundaries is controlled by interface definition. The focus for innovation on every stage is based on decomposition of the end customers' requirements.

In this article is presenting **interoperability concept** for speeding up innovation in open system environment by using **knowledge communities**. This concept is explained in the chapter: "**Interoperability Concept**." The open innova-

tion is crossing company and technical systems boundaries. Increasing dynamics and interaction on the boundaries is boosting innovation. The **interoperability concept** is providing a framework that allows bidirectional dialogue and exchange of knowledge at the boundaries in structured way. This is explained in chapter: "**Innovation Boundaries**."

The chapter: "**Knowledge Interface and Punctual Innovation**" focuses on innovation content creation. **Punctual innovation** is mechanism to focus the network innovation. The innovation process that is distributed to network and having to multiple dialogues over the boundaries is difficult to manage. **Punctual innovation** creates coherence in discrete activities of innovation process to act in same direction, which is customer value. The **interoperability concept** as a modeling tool of network competences is presented through case study in chapter: "**Innovation Network Environment, Case Medical Healthcare**."

## INTEROPERABILITY CONCEPT

### Innovation Process and Theoretical Background

The logics of closed innovation were working quite well until the end of 1990 decade. Now the efficiency of that approach is disappearing and it is partially replaced by the logics of open innovation (Chesbrough, 2003). The idea of open innovation is to use external and internal ideas in product development. Figure 1 illustrates the systematic approach of open innovation. The difference to closed innovation is to systematize the analyzing and use of business intelligence coming from various knowledge and information sources. Integration of external innovations means validating and integrating the information into internal innovation process.

Succeeding in open innovation requires excellent collaboration between knowledge sources

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