Risk Management in Enterprise Networking

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INTRODUCTION

Enterprises aim to gain benefits and competitive advantages by creating and participating in cooperation networks. Long-term collaboration networks are also called breeding environments (Afsarmanesh & Camarinha-Matos, 2005) to describe the need for systematic development of collaboration preparedness. As there is a customer request, a short-term virtual organization (VO) is created to fulfil the task, which most often is a delivery of a product or a service to the customer (Karvonen, Jansson, Salkari, & Ollus, 2004; Kürümlüoglu, Nøstdal, & Karvonen, 2005).

Different companies may have different motives for networking. Typically, companies focus on their core competences and acquire the additional knowledge and resources by developing relationships with external enterprises. The network managers often aim at cost reduction and risk transfer, especially transferring fixed costs to variable costs. Networking may also be needed because customers want to have new types of products or extended products (Thoben, Jagdev, & Eschenbaecher, 2001). The extended products may require knowledge which is not available inside the company. For SME companies the motive for networking may be to find new business opportunities and to increase their knowledge in the collaboration.

Business activities, which generate opportunities, most often include risks. In networking, the companies become more dependent on each other and thus also their risks and vulnerability are increasingly inter-dependent. The tighter relationships may also contribute to disturbance propagation in the network. Some risks are transferred from one company to another, some risks decrease, and others increase. Additionally network-specific risks, for example investments to increase the preparedness for collaboration, may be needed. The viewpoints of network managers and partners are different; also concerning risks. Especially SMEs do not always see the risk dimension while they are networking with other companies.

Even if there is a lot of research in collaborative networks and virtual organizations (Camarinha-Matos et al., 2005), there is no consolidated view on risk management in this environment, and about how networking changes the overall risk level. The risks of enterprise networks have mainly been studied as part of supply chain management, procurement, or outsourcing as reviewed in Hallikas (2003), and the view has mainly been that of the process manager. In project management field (PMBOK, 1996); risk management is presented as one of the nine sub-processes; analyzing the factors which affect the project costs and delivery punctuality. In project industry, other risk types like environmental, personnel, and information risks are considered as part of project risk management (Pitkänen, 1999).

The article discusses networking and risk management using partly the results of a research carried out within two manufacturing networks in Finland (Hallikas et al., 2001) and ECOLEAD project (Camarinha-Matos et al., 2005).

RISK AND TRUST

There are several definitions for risk applied in different fields. Typically, it is defined as a possibility of losses or unwanted consequences. Wikipedia (2006) states that "Risk is the potential harm that may arise from some present process or from some future event." Thus most often and in everyday life risk is linked to potential negative outcome. However, in some specific fields, also unexpected positive outcome is considered as a risk: "Financial risk is often defined as the unexpected variability or volatility of returns, and thus includes both potential worse than expected as well as better than expected returns." (Wikipedia, 2006)

In this article, risk is considered as uncertain unwanted events with two "dimensions": the level or amount of harmful consequences and the probability of their occurrence.

Risk management is related to the concept of trust, which is considered as a success factor in collabora-

tion networks. Trust is needed to operate in shared risk environments where the partners are increasingly dependent on each other (CTP, 2001). Trust enables speeding up of the inter-enterprise processes and decreasing the monitoring and management costs. Trusting partners are able to collaborate, adapt themselves, and react also in case of incomplete information. It has also been noted that trust is crucial to the success of e-commerce (van den Berg, Hannus, Pedersen, Tolle, & Zwegers, 2000). As such, trust does not remove all the uncertainties. Risk management can contribute to justified trust when the risks are known and the companies have prepared to them.

Trust again has many definitions, which have been reviewed for example in Blomqvist (1997) and in ECO-LEAD D21.4b (2006). In CTP (2001), trust is reviewed in networked businesses with a definition: "Trust is the degree of vulnerability participants to an exchange are willing to assume in pursuit of a mutually positive outcome." That is, the partners accept the uncertainty in the exchange, because they believe that the co-partner will be able to perform the promised task and not advisedly act against their objectives. In addition, they believe that they can attain future benefits by today's actions. The higher trust, the higher potential unwanted consequences are accepted, because the probability of the negative outcome is considered low.

RISKS IN LONG-TERM COLLABORATION: NETWORKS OR BREEDING ENVIRONMENTS

An enterprise network (or a breeding environment) is built of separate, autonomous companies. The existence of the network is not an objective as such. If it is not working well enough it can be replaced by another network. Thus, there is not only one objective in a network: the autonomous organizations have their own objectives, which most often exceed the objective of the network.

Accordingly, there is not only one risk of the network even if the risks of the organizations are interdependent. Each company has its own risks, which may depend also on other networks or organizations. Additionally, not all enterprises in the same network are in the same position in relation to risks. Their ability to carry risks also varies. In the end, each company has to manage its own risks. This brings up the need for the network

participants to be aware and self-manage their risks. It should be helpful if the network or breeding environment could offer the partners information and services, which can support the management of their risks.

Independent on the role in the network, the network partners face the following uncertainties in the collaboration (ECOLEAD D32.1, 2005).

- The uncertainty about the intentions, actions, and performance of the network partners and network management
- Information security issues like keeping up confidential information

The uncertainties caused by the collaboration are, of course, only part of all the risks of the participating organizations. However, the decisions and choices made in the collaborative environment may also affect the capability of the organizations to survive in the business environment, in technology changes, in investment paybacks etc.

In cases, where an original equipment manufacturer (OEM) has created a network around it to manufacture the product, the OEM is typically the responsible partner to the customer. Networking with suppliers allows the company to focus on its core competence and gives it flexibility against economic cycles and varying demand. Thus it may transfer some risks of low demand to its partners. In customer deliveries or virtual organizations, the OEM most often carries the responsibility of the success of the delivery against the customer.

A typical trend in collaboration is that the network partners are expected to prepare for higher responsibilities in customer deliveries. They need to manufacture or assemble larger systems or also participate in product development. To do this, they often need to invest more in their physical or intangible assets, and at the same time, they need to accept the involved risks. In case of SMEs, the partners don't always have the preparedness to rise to the challenge and to carry the increased risk. It is beneficial for the whole network, that all the partners understand the requirements and risks of the new way of working.

Hallikas et al. (2001) describe in more detail the transformation of partner risks as they start to operate in collaborative networks:

1. The risk of too low or inappropriate demand for a network partner. As not only the companies, but

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