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Recommended Citation

Raven, Arjan, "Improving New Product Development: The Role of Information Technology in the Creation and Sharing of Tacit Knowledge" (1997). *AMCIS 1997 Proceedings*. 146.

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Improving New Product Development: The Role of Information Technology in the Creation and Sharing of Tacit Knowledge

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Introduction

Traditionally, information systems use has focused on explicit knowledge that can be easily captured and transferred through information technology. Recent views of work (cf. Brown and Duguid, 1991; 1995, Nonaka and Takeuchi, 1995), however, suggest that in addition to explicit knowledge, tacit knowledge plays a key role in work. The study that is discussed here shows that tacit knowledge requires a different view of information technology use.

Almost all our behavior, and most of our ideas result from the use of tacit knowledge. We usually do not explicitly think about what we do. Instead, we rely on routinized experience. Tacit knowledge is knowledge that is applied without thinking, people are generally not aware that they are using it. Tacit knowledge exists in individuals or groups of individuals, is dynamic, and is created through repeated experience and experimentation. This study distinguishes between two types of tacit knowledge. The first type is **entrenched** knowledge. This is knowledge that is very difficult to articulate and share. The second type, **articulatable** knowledge can easily be made explicit, and is therefore easy to share. Explicit knowledge, in contrast, is articulatable knowledge that has been articulated, abstracted from the environment in which it was used.

Entrenched knowledge is embedded in its environment, it is situated in a context (Brown and Duguid, 1991; 1995; Lave and Wenger, 1991). In sharing entrenched knowledge it is not possible to simply articulate and transfer the knowledge. Two people who want to share entrenched knowledge have to enter a mentor-student type of relationship with "intelligent-cooperation" (Polanyi, 1967, p.5), in which not only the knowledge, but also the context in which the knowledge is situated is re-created and understood by the student.

Research question

Information technology is very suitable for the transfer and storage of explicit knowledge. However, very little is known about how information technology can be used for the creation and sharing of tacit knowledge in general and entrenched knowledge in particular. This study seeks to investigate the role of information technology in the creation and sharing of tacit knowledge. To focus the research, the study will be conducted in new product development teams that work on high-tech products. In this environment the pressure to be innovative is high, and relevant knowledge quickly becomes outdated, leading to a strong need for knowledge creation. Because of this need it is expected that the teams will have advanced knowledge creation practices. Better knowledge creation results in better new product development.

The research is guided by the following question:

What is the role of information technology in the creation and sharing of entrenched and articulatable knowledge in new product development teams?

This general question will be investigated through four propositions:

1. Tacit knowledge sharing and creation requires the forming of strong relationships between team members;

2. Information technology can support the formation and/or maintenance of relationships between team members;
3. Information technology supported relationships between team members lower the cost of socializing a new member into the team;
4. Information technology can limit the flexibility of the relationships between team members.

Research Method

In the study a questionnaire is being administered to all members of two new product development teams in two companies in the USA, Finland, and Sweden, for a total of six companies and twelve teams. The survey yields data on 1. Managerial factors; 2. Activities around the creation and sharing of tacit knowledge; 3. Information technology use; and 4. Knowledge and information transfer between groups. The data will be analyzed through factor analysis, analysis of variance and regression analyses. As part of the data analysis follow-up interviews will be conducted to clarify and discuss findings.

The list of references is available at <http://www-rcf.usc.edu/~raven/ais97>