

Chapter 12

The ‘Perfect Technology Syndrome’: How to Solve the Technology Dominance in Technology–Program Projects

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ABSTRACT

Recent research literature in product innovation has paid attention to the fact that technological discipline can lead to dominance by a knowledge base. Technology-intensive development is often partially and publicly supported and problems in finding a proper balance in technology development are in common interest. The objective of this study is to deepen the understanding of the dominance by technological knowledge base with reference to the sources, consequences and solutions of this overemphasis. Finnish publicly supported technology-intensive product innovation projects are studied. In the case studies, examples of the ‘perfect technology syndrome’ are identified and their sources are analyzed. This syndrome describes the intention to achieve the ultimate level in the technology development. Solutions proposed to the unfavorable consequences included alliances with organizations having complementary resources, careful pretesting of products with key partners and developing the technological products to specific target groups.

INTRODUCTION

Technology has kept its position as a key factor in technology-intensive product innovation. The prize of the first-mover advantage is a unique position in the market without competition and a wide time margin to exploit the technological breakthrough (Lieberman & Montgomery, 1988).

Where the pioneer position is no longer available, one alternative policy is to aim for the ultimatum reach in the technology – to attain the perfect technology.

Technology challenges, developers try to and overcome all perceived technological limitations, without necessarily paying adequate attention to the commercial demands of user-friendliness, branding or customer preferences (Ernst & Soll, 2003). Aspirations towards ‘perfect technology’

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are inherent to publicly supported technology development but common also in privately financed technology-intensive product innovation. Typically, public financing is directed solely to facilitate the development of the technology and addressing technological problems; funding the solutions to all other challenges is assumed to be the developer's own responsibility. One possible consequence of such public financing is that it is only the technological challenges that simulate the developers. Technology-intensive development is often partially and publicly supported, and problems in finding a proper balance in technology development are in common interest.

This study uses 'perfect technology syndrome' to describe the intention to achieve the ultimate level in the development of the technology. 'Technology dominance' is used in the literature to describe overemphasis of technological resources (Kim & Mauborgne, 1997). The dominance of technology has been discussed in many outstanding papers and books. Burns and Stalker (1961) observed technology development projects in Great Britain in the 1940s. In them an intensive publicly supported technology development phase was followed by strong technological orientation when the products developed were brought to consumer markets. Cooper (1975) listed a strong technology orientation as a key barrier to the commercialization of innovations. Ettlie (1982) compared radical and incremental innovations developed in public organizations. He noticed that a strong technological orientation had serious negative consequences. However, despite these critical reports, the observations indicate that the dominance of technological knowledge base has persisted with an alarming extent, in technological product innovation projects.

The objective of this study is to deepen the understanding of the dominance by technological knowledge base with reference to solutions of this overemphasis. This study will start with a discussion of knowledge bases of product innovation. Then, the 'perfect technology syndrome' is described. The underlying motives for one-

sided technology development orientation will be discussed, as well as the associated risks and challenges of such orientation. More specifically, the traps associated with overdeveloped technological enthusiasm will be described. Then, three solutions used by successful technology-oriented industrial organizations are identified. Finally, guidelines for implementing these solutions in other organizations are given. In course of time, the development of the innovation process and the knowledge-related, resource-based dependence change the context of the knowledge utilization, and adaptations to the development process may be necessary.

THEORY ON KNOWLEDGE BASES OF INNOVATION

Features of a Knowledge Base

The concept of a knowledge base refers to the managerial and organizational cognition and concepts about the development project and its environment, and the relationships between these. In contrast to a database, the knowledge base also includes tacit knowledge, such as values, routines and stories. Cohen and Levinthal (1990) have discussed some key features of a knowledge base, which explain how one knowledge base can dominate the other knowledge bases. Typical features of a knowledge base are the demand for prior knowledge, cumulative nature of knowledge development, filtering of knowledge and knowledge-base-specific language.

Demand for prior knowledge: for any knowledge to be focused and to be of interest, there must be some prior knowledge. New knowledge cannot ring the alarm bells in the organization if there is no knowledge base where the new knowledge can be received. Some of the prior knowledge needed can be recruited with new professional personnel, and some of it is related in an evolutionary way to experience, especially dramatic experience within the organization.

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