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Integration of market pull and technology push in the corporate front end and innovation management—Insights from the German software industry

Alexander Brem*, Kai-Ingo Voigt

Friedrich-Alexander University of Erlangen-Nuremberg, Chair of Industrial Management, Lange Gasse 20, 90403 Nuremberg, Germany

Abstract

Within the framework of this paper, an extensive literature overview of technology and innovation management aspects on market pull and technology push will be given. The existing classification of market pull and technology push will be particularly shown and called into question by suggesting a conceptual framework. Additionally, the most common front end innovation models will be introduced. Finally, the authors will introduce how a technology-based service company is managing the connection of these two alternatives. A special focus will be laid on the accordant methods in order to search for current market needs and new related technologies. The selected case study will focus on one of Germany's biggest and most successful software development and information technology service providers. Based on interviews, document analysis, and practical applications, an advanced conceptual framework will be introduced as to how market pull and technology push activities within the corporate technology and innovation management can be integrated. Hence, the purpose of the paper is to introduce a theory-based conceptual framework that can be used in today's corporate environment. In this context, technology managers may use the results as a conceptual mirror, especially regarding the influencing factors of innovation impulses and the use of interdisciplinary teams (with people from inside and outside the company) to accomplish successful corporate technology and innovation management.
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1. Introduction and purpose

Organizations and businesses have recognized the need for finding new methods and paradigms to efficiently serve existing and new markets with new and/or modified products as well as services (Ansoff, 1965). Thus, the changing global environment is compelling organizations and businesses to permanently seek the most efficient models to maximize their innovation management efforts (Christiansen, 2000). As innovation is a responsibility of all business units and departments, their involvement needs to be determined accordingly (Tucker, 2002). In this context, an organization's ability to identify, acquire, and utilize (external) ideas can be seen as a critical factor in regards to

its market success (Zahra and George, 2002). This so-called 'Front-End of Innovation' is therefore one of the most important areas of corporate management.

Technology and technology-oriented companies, especially in the business-to-business area, are traditionally more influenced by new technologies than other companies. However, firms in the business-to-consumer sector focus more on end-users, and, therefore, market-induced impulses. The related scientific discussion regarding the 'right' innovation management and especially the 'best' source of innovation is similar to the question of whether the chicken or egg came first. The question becomes even more complex since there are several examples of successful technology-oriented companies as well as market-oriented ones. Therefore, the question is not which view is right or wrong, but if there is a practicable way to combine both views or even extend them to other related factors.

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*Corresponding author. Tel.: +49 911 5302 235; fax: +49 911 5302 238.
E-mail address: brem@industriebetriebslehre.de (A. Brem).

Hence, the purpose of the paper is to introduce a theory-based conceptual framework that can be used in today's corporate environment. In order to achieve this, the related theoretical background (with a focus on the front end of innovation) is discussed, supplemented by a case study from the German software industry. Finally, the discussion and implication section summarizes and consolidates the findings of both parts with the introduction of

- different case-specific sources for innovation impulses,
- an extended conceptual framework for corporate innovation management and
- an advanced front-end innovation approach.

2. Theoretical background and literature review

2.1. Conceptual classifications

In order to build a common understanding of market pull and technology push activities, some fundamental considerations will be introduced.

Dealing with technology means to handle different stages of research and therefore special management duties and responsibilities (see Fig. 1).

According to Specht (2002), the stages of technology development and pre-development activities belong to technology management. The field of R&D management is determined by adding upstream fundamental research as well as product and process development. Finally, innovation management includes the product and market introduction phase. Thus, innovation management can be defined as 'a systematic planning and controlling process, which includes all activities to develop and introduce new products and processes for the company' (Seibert, 1998, p. 127) or, in short, the dispositive constitution of innovation processes (Hauschildt, 2004). Following Thom (1980), these innovation processes can be divided into the stages of 'idea generation', 'idea acceptance', and 'idea realization' (see Fig. 2).

Obviously, every innovation is based on an idea from inside or outside the company (Boeddrich, 2004). In order to obtain a maximum number of innovative product and

process ideas, a holistic view of the innovation process is needed. Hence, the basic approach of Thom (1980) is to collect as many promising ideas as possible; therefore, the determinations of the search fields are especially crucial to the whole innovation process. Search fields can be identified, for instance, by defining the individual user needs and the current product value (Burgelman et al., 2004). The idea acceptance phase consists of several stages through which the ideas have to pass and where they are enriched (Cooper, 2005). When realizing the selected ideas, it is important to choose efficient ways of saving resources (Aeberhard and Schreier, 2001). The final success of idea management strongly depends on the right process structure for the different kinds of ideas and the corresponding adequate organizational implementation (Voigt and Brem, 2005).

2.1.1. Fuzzy front end of innovation

For further consideration of the matter, the understanding of the front end of innovation (FEI) plays an important role. Therefore, FEI will be defined and some recent approaches will be introduced.
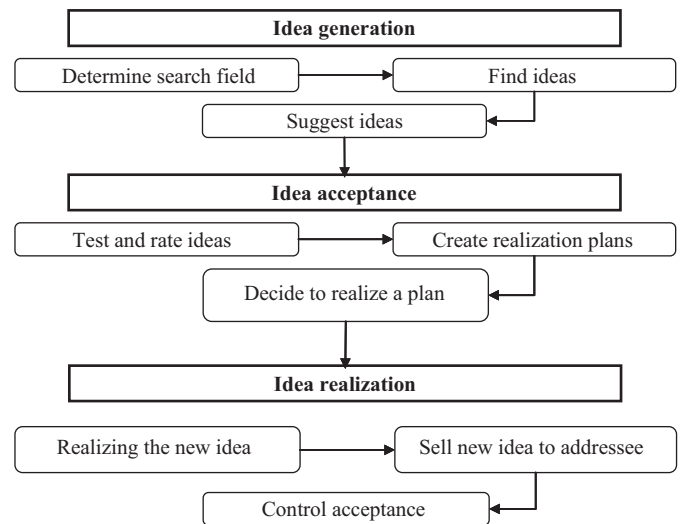
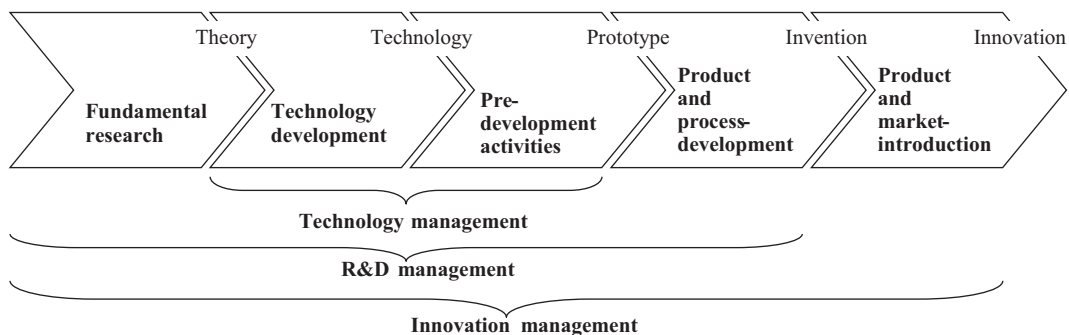Fig. 2. Standardized stages of the corporate innovation process (Thom, 1980).

Fig. 1. Classification of technology, R&D and innovation management (Specht, 2002).