Innovation Policies in Managing Growth for High-Tech Companies: A Tactical Synthesis of Management Insights

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ABSTRACT

Given the high percentage of turnover invested in R&D, the cost structure and segmentation of investment in high-tech firms necessitate regular review of resource allocation. For high-tech firms, the vital importance of innovation management is one of the building stones of a successful business. The key question remains how innovations can be managed throughout the S-curve of technological performance from the strategic point of view? The aim of this study is to capture an innovation framework for high-tech firms enabling them to actualize the value of technological breakthroughs based on a case study. The author’s results are performance-driven. She will address some of the causes behind a technological failure along with its impact on the firm’s profit margins. Based on the management insights of her case company, the author sees that innovation policies in high-tech companies can be dissected into four main management phases: sources, formulation, execution and maintenance. New research opportunities are opened in the performance review of technological innovations for listed companies.

Keywords: Innovation Management, Innovation Policies, Technological Designs and Performance Measures, Technology Sector

1. INTRODUCTION

Most of the high-tech firms spend a significantly larger amount on research and development than government institutions, and these firms consider their in-house R&D to be one of their most important sources of innovation. For high-tech firms, top management may face constant pressure of profit maximization via commercialization of patents and intellectual property rights. In the present study, high-tech firms primarily refer to dynamic firms operating in the IT industry. We have chosen to focus on high-tech firms in this paper because these firms tend

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to spend a significant amount of their turnover in R&D making changes to their established products and processes. (Kanter, 1983; Cusumano, 2004) The amount of investment can vary from as low as 0.5% of turnover with a low rate of change to over 20% of turnover with a high rate of change (Fleming, 2002). Given the recent technological advancement, it is evident that the impact of technologies is huge to high-tech firms. (Xia, 2012) In response to some of the cause of technological failures, innovation management can be designed by understanding the dynamics of the S-curve of technological performance, which governs the cycle of innovation managed within the firm. Subsequently, the research problem of this study is formulated as follows: how innovations can be managed throughout the S-curve of technological performance from the strategic management point of view? The research problem can be broken down into the following sub-questions stated as follows:

1. What are the challenges of technological breakthroughs?
2. What are some of the means to manage technological innovations?
3. Can we incorporate the effect of technological challenges to firm operation?

The structure of this study is organized such that we aim to update our existing knowledge on innovation management and apply this knowledge to evaluate some of the means by which technological innovations can be managed in high-tech firms. We will detail our discussion of strategic thinking along the S-curve of technology performance while controlling for situational constraints via a case study. Alternative solutions are presented and prioritized following the evaluation of strengths and weaknesses of the existing framework. We will conclude our studies with summary of results and possible follow-up of future research opportunities.

1.1. Value Based High-Tech Innovations

The strategic management of technological innovation remains one of the popular topics of management research. This is because factors that lead to innovation success play a major role in profit maximization for especially high-tech firms. The increasing importance of innovation management has been largely driven by the increasing globalization and rapid advancement of software technologies that enable better process designs and shorter production runs to be economically feasible (Schilling, 2008; Hill, 2003). As a matter of fact, firms receive more than one third of their sales and profits from products developed within the past five years (Fleming, 2002). Consequently, we are interested in evaluating some of the strategic aspects of product/innovation management throughout the S-curve of technology performance for firms operating in the technology sector based on the results of a case study. This section acts as the foundation for the empirical analysis of innovation management in the subsequent section.

Innovative technology can be defined to be radical changes in the business processes or products starting from a creative idea (Bessant and Tidd, 2007; Bessant, 2007). The rise of the snowboarding industry provides a rich example of how innovation stems from users who create solutions to meet their own needs (Schilling, 2008). Previous literature has defined innovative technology to be the synthesis of the existing knowledge in the original, relevant, valued new products or processes, which are subsequently introduced into the market (Horngren, 2002; Fleming, 2007; Berk and Demarzo, 2007). In the organizational context, innovative technologies are often linked to better performances and revenue growth via improvements in efficiency, productivity and quality (Anderson, 2006; Acharjee et al., 2014). However, technological failures are equally destructive in terms of firm value wearing out profitable organizational forms and practices (Cesarotti et al., 2014). Therefore, risk management of technological innovations is
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