

Opening up the NPD Process: A Case Study within the Oil & Gas Industry

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Abstract

This article investigates the practical application of open innovation principles within industrial new product development (NPD). Previous research on open innovation has primarily focused on the notion as such and not yet on how to integrating the principles of open innovation with well-established models for NPD. We aim to help close this knowledge gap. The purpose of this study is to explore how firms can benefit from opening up the NPD process by integrating the principles of open innovation with the well-known and widespread Stage-Gate model. To do this, previous literature is studied in combination with case study data investigating the existing occurrences and potential opportunities of employing the principles of open innovation within NPD at a firm within the upstream Oil & Gas business. Our empirical study shows that there are great virtues in the systematization of the already occasionally occurring open innovation practices. Additionally, a noticeable desire to pursue a more open approach to NPD was identified among the respondents. The results of this study allowed the enactment of a practitioner-oriented work model, named the *Open Stage-Gate Model*, which exploits the advantages of “openness” while simultaneously capturing the benefits deriving from the systematic and structured approach implied by the Stage-Gate model. Furthermore, by opening up the Stage-Gate model, yet another opportunity is exposed; to allow the work model to facilitate a systematic adjustment of the way value is created and captured within the company (i.e. its business model and its underlying core capabilities) to the external environmental dynamics. This aspect is further included in the *Open Stage-Gate Model*. The main implications of this study are that it indicates great opportunities and possibilities in opening up the NPD process. It further introduces an easy applicable work model that facilitates the opening. Moreover, our results apply not only to firms within the Oil & Gas industry, but to all NPD processes where a Stage-Gate methodology is employed.

Introduction

“Innovators win” is the common message in much of today’s business literature. The question is no longer why to innovate, but how to innovate. All innovative activities need not be performed by a focal firm, however. A recent trend in the evolution of innovation theory recognize that not all good ideas will come from inside the organization; neither need all good ideas created within the organization be successfully launched as final products. Henry Chesbrough (2003) coined the term open innovation to describe this trend and ascertained that a new era within innovation management is emerging: the era of open innovation. This view is supported by Bromley (2004) in his brief review of the technological evolution in the U.S., mentioning open innovation as the latest, rapid growing trend. Chesbrough (2003) defines open innovation as “*the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively*” (2003: 1). The inherent logic of this definition is, simply, that firms can and should use external ideas as well as internal ideas, and both internal and external paths to market, as firms seek to maximize their returns from new product development (NPD).

On a practical level, many executives have come to realize that in today’s global competition, it is not enough to merely use innovative ideas generated internally, when millions of scientists and innovators are working outside their organizations. Procter & Gamble, for example, emphasizes the outcome of changing their perception on R&D execution. Going from “Research & Develop” to “Connect & Develop”, P&G aimed at leveraging the full potential of the 9000 internal employees plus the estimated 1, 5 million potential innovators outside the organization (Huston & Sakkab 2006, 2007). The application of “Connect and Develop” at P&G lead to an increase in R&D productivity by about 60 %, while steadily approaching the goal of finding half of their innovations outside of the company. Similarly, Air Products uses their “identify and accelerate” strategy for identifying technical needs and creating external partnering strategies that accelerates their innovation process (Tao & Magnotta, 2006). To facilitate this strategy, Air Products have initiated corporate-wide processes to quantify and prioritize the top technical needs, recognizing that this is imperative in order to focus on open innovation efforts. To fill identified needs, external partnering strategies are employed systematically including global R&D in-sourcing, Internet-based providers, partnering with the government and licensing-in (Tao & Magnotta, 2006). These tools and approaches have enabled Air Products to innovate faster, better and at lower cost. Although somewhat anecdotic, these two examples illustrate the benefits resulting from a more open approach towards innovative activities.

Given the success of some pioneering firms, it seems justified to ask why not more companies adopt a more open approach to innovation. One reason was uncovered by Chesbrough and Kardon Crowther (2006) who argued that many companies struggle with the challenge of sustaining internal commitment over a sufficient period of time to realize the benefits from adopting open innovation. They found that moving from a set of ad-hoc processes to clearly define open innovation practices, systems, roles, and responsibilities are important factors to ensure successful adoption of open innovation across the organization. A significant element in realizing the potential benefits of open innovation is integrating and modifying existing innovation activities and processes to fit with open innovation principles, rather than creating something completely new (Chesbrough & Kardon Crowther, 2006). Witzeman et al., (2006) further concludes that building external thinking into the firm requires change, and thus the firm must review and revise their current NPD practices. The integration of the principles of open innovation with current NPD practices is addressed in this study.

More precisely, the purpose of this study is to explore how firms can benefit from opening up the NPD process by integrating the principles of open innovation with the well-known and widespread Stage-Gate model. This is an interesting research problem with high potential for empirical research as well as to add to previous understanding of new product development. To address this issue, this paper sets out to create a dynamic and practitioner-oriented work model that leverages the benefits of open innovation, minimizes the associated risks, and allows for systematical evaluation and reconfiguration of the way value is created and captured within the NPD process. Some best practice companies have already begun to open up their NPD process (see e.g. Cooper, 2008). However, the existing literature falls short on describing how these companies have adapted their internal work models to facilitate open innovation. Therefore, we argue that there is a need for a new and revised model that helps practitioners adapt their current NPD process to incorporate the principles of open innovation. Accordingly, such a model provides a point of departure in the transformation process toward a more “open”, yet systematic, approach of conducting industrial NPD.

This article is organized as follows: First, we review previous research based on three bodies of literature that constitute the theoretical point of departure of this research, leaving each area at the point where the literature is to be advanced. The methodology is further presented for the conducted case study followed by the results. Following the results is our recommendations and the introduction of the *Open Stage-Gate Model*. A section on discussions as well as theoretical and practical implications is finally presented, complemented with suggestions for further research.