

## **New Product Development: A 21<sup>st</sup> Century Perspective**

Srinivas Adavikolanu and Raghu Korrapati  
School of Management  
Walden University, Minneapolis, MN 55401, USA  
[srinivas\\_a@hotmail.com](mailto:srinivas_a@hotmail.com)

### **Abstract**

Successful introduction of new products in the market place is critical to the continued success of any company. Increased competition in the 21<sup>st</sup> century global economy and advances in the Internet technologies have significant impact upon the approach of businesses to new product development (NPD). Some of the latest developments in NPD activity are examined as presented in the overview of current issues in NPD and factors leading to NPD success. This examination provides a context-specific situational methodology to NPD practitioners in industry. A conceptual framework of NPD process is designed as a set of simple guidelines for use by corporate managers and entrepreneurs to enhance new product success rates.

### **Introduction**

Successful introduction of new products increases the revenue generation and profitability of the businesses [1]. The long term viability of any business organization, therefore, is critically dependent on new product development (NPD). Corporations also employ the NPD strategy to sustain competitive advantage by entering emerging markets and improving the market share. In some situations, the NPD strategy becomes imperative as the result of changing customer needs or market conditions. The ever increasing number of research articles published on this topic is testament to the continued interest in NPD activity among researchers as well as practitioners.

Literature reviews on NPD research highlight generalized organizational processes and behaviors that contribute to the success of new products in the marketplace. Ernst (2002) [2] classifies the success factors for NPD into five categories including the NPD process, organization, culture, leadership, and strategy. Within these general categories are several nuances that need to be understood and applied according to situational context. Researchers have employed several metrics and methodologies for measuring the success of new products that are introduced in the market place [3] [4]. Hart (1993) [4] notes in her conclusion that measuring success in NPD is multi-dimensional, and the research findings are meaningful only when the “dynamic inter-relationships” between dependent and independent variables are clearly understood. The academic and business communities are well aware that NPD is a high risk activity [5] [6]. Failure stories abound in NPD due to a variety of causes attributed to managerial behavior [7], change management issues resulting from product proliferation [8], and the inadequate customer focus in product design [9].

Recent empirical data from NPD research publications are analyzed in this presentation to identify the major issues that corporate managers need to address in the development of new

products. The findings are summarized according to success factors, and concise rules are presented for use by corporate managers and NPD professionals.

## **An Overview: New Product Development**

Research studies in NPD typically examine the effect of organizational strategy, structure, behavior, and environment on the successful development of new products.

### **Strategy**

Strategic framework drives critical decision-making in an organization, including decisions that relate to NPD. It is important to have a NPD program that links the NPD projects to company strategy [10]. Empirical studies indicate that focused product development strategies, such as the leveraging of proprietary core technologies, result in better economic performance [11]. In a study of over 200 new product introductions, Datar et al (1997) [12] identify that strategies such as concentrating on core products enabled rapid prototyping, but resulted in a longer time to volume production. Schilling & Hill (1998) [13] propose a model NPD program that starts with articulation of company strategic intent. This model identifies the construction of the NPD portfolio, strategic alliances or executive sponsorship, selection of cross-functional teams including customers and suppliers lead to the effectiveness of the NPD process as measured by the reduced time-to-market. The research thus indicates that NPD success is contingent upon strategic decisions that result in matches between company capabilities and markets to be served.

### **Organizational Structure**

Critical to NPD success is the organization of scarce, consumable resources and personnel with varied skill sets into a coherent structure that delivers the intended results. One commonly recurring theme in research of NPD organizational structure is the importance of cross-functional teams [14]. Citing data from approximately 1000 Japanese and American firms, Song & Parry (1997) [15] verify a conceptual model that predicts the relative product performance as a function of several variables, including cross-functional integration. This research concludes that a high level of cross-functional cooperation enhances NPD success during different stages, such as product testing and market launch. Cross-functional cooperation also facilitates the process of obtaining consensus from various departments in case a project needs to be terminated.

In view of the cross-functional nature of NPD activity, businesses have adopted novel approaches to meet the ever-increasing demand for successful new products. Bernasco et al (1999) [16] describe a “Balanced Matrix” organization to overcome the functional barriers during the NPD process by a shared and equal responsibility between the project and functional managers, with the former deciding on what needs to be accomplished and the latter focusing on how it will be accomplished. Dedicated product innovation teams are also recommended by the researchers [17] as a source of NPD success and to ensure the focus of personnel and resources. This empirical study found that cross-functional groups doing only NPD work existed in 51.7% companies that showed the best NPD performance.

## **Organizational Behavior**

Impact of the behavioral issues of the organization such as leadership, communication, and the culture of risk-taking receives wide attention of the NPD research community [2]. Empirical research data shows a positive correlation between these behavioral aspects and NPD success. The importance of the role played by senior management in the NPD process is a key determinant to its success. Continuous engagement and commitment of senior level management at every level including design, development, and operation is found to be a major factor that differentiates between the best- and worst-performing NPD teams [18] [19]. Sarin & McDermott (2003) [20] report that a participatory style of decision-making, and the ranking of the team leader in the organization enhances the success rate of the NPD projects. Leadership traits that contribute positively to NPD success include employee motivation, coordination, approachability, and vision [21].

Effective communication is critical to any business activity, and it is even more so in the case of NPD as cross-functional teams are involved. The study of Ebadi & Utterback (1984) [22] on the relation between communication and technological innovation indicates that frequent communication improves project success rates, while the formality in communication has negative impact. Reflecting the current globalization trends, more recent studies explore the communication issues present for global NPD teams [23] and the use of web-based Information Technology tools to facilitate the communication process [24].

Researchers have recognized that the presence of innovation-supportive culture promotes behavioral patterns such as creativity, risk taking, and teamwork that are conducive to NPD work [25]. Since the development of new products is risk-laden and context-specific, creative methods for solving problems that include the side-stepping of established rules are recommended [26]. Sivadas & Dwyer (2000) [27] introduce the concept of “cooperative competency” that is a combination of cultural traits such as trust, communication, and coordination. High degree of cooperative competence is viewed to have a positive effect on NPD success when product development work is executed internally, or through an alliance. Attention to cultural aspects of NPD is particularly critical when global firms are developing new products for international markets [28].

## **Environmental Factors**

Development of new products is an essential part of corporate entrepreneurship. Higher level of corporate entrepreneurship is known to result in existence with higher level of innovation [29]. It is maintained that NPD activity being entrepreneurial by nature both influences and is influenced by the environment. The impact of the NPD work on the environment, and vice-versa, does not attract significant attention of the research community and appears to be limited to market and technological uncertainties.

In one of the important empirical studies in this area, Calantone et al (2003) [30] investigates the impact of the market and technological turbulence on the NPD performance of diverse industries in automotive, electronics, publishing, and manufacturing sectors. This study concludes that industries facing uncertainties in technology and market conditions are better served by taking an

“expertise-centered decision making” approach towards NPD rather than by taking a market-oriented approach. The market and technological uncertainties were also found to be country-specific and sometimes had a positive effect in increasing the time-efficiency in NPD [<sup>31</sup>].

Dynamic market conditions can result in significant changes in NPD strategies. The empirical investigation of Singh & Sushil (2004) [<sup>32</sup>] advocates a flexible product development model taking into consideration the variations in product design, managerial processes, and partner selection. Introduction of new products can also alter the market landscape and elicit strong competitive reactions [<sup>33</sup>]. Firms are therefore advised to have a competitive defense strategy to counter the reactions of competitors.

### **NPD Methodology for the 21<sup>st</sup> Century**

NPD is a daunting task for any company whether it is a multi-national conglomerate or a new start-up. As indicated, alignment with company’s strategy, availability of the requisite resources, high degree of coordination between cross-functional teams, constant communication, management sponsorship, and flexible project management practices are some of the major contributing factors for NPD success. Study of NPD literature reveals several prescriptive methodologies that are offered to NPD practitioners for improved success rates in this high risk business activity. These NPD models are derived both from extensive literature reviews [<sup>2</sup>] and from detailed empirical studies [<sup>34</sup>]. These studies appear to suggest that diligent adherence to the so-called rules or success formulae will lead to NPD success.

After examination, however, it is concluded that the dynamic business scenario of the 21<sup>st</sup> century, in which companies are subjected to constant local and international pressures to compete, calls for a new approach to the NPD activity. There is an increasing tendency among NPD researchers to move away from the static prescriptive models to more dynamic paradigms that incorporate global [<sup>35</sup>] and situational aspects [<sup>36</sup>] of the NPD work. In the current global business environment, strong leadership combined with an entrepreneurial culture is advocated for NPD success. The following five guidelines are thus proposed to the Chief Executive Officers and corporate leaders of 21<sup>st</sup> century businesses to facilitate and to achieve success in the development of new products.

**Guideline One:** Articulate a clear NPD strategy based on the overall organizational goals.

**Guideline Two:** Create dedicated teams to ensure continued focus on the NPD work, to include engagement of cross-functional and global teams, where possible.

**Guideline Three:** Provide adequate financial and human resources to the NPD teams.

**Guideline Four:** Assign challenging projects, and provide suitable rewards, to foster creativity among NPD teams.

**Guideline Five:** Communicate regularly with the NPD teams to evaluate progress, identify new opportunities, and adapt to dynamic business conditions.

A conceptual framework of the NPD activity based on the above guidelines is shown in Figure-1.

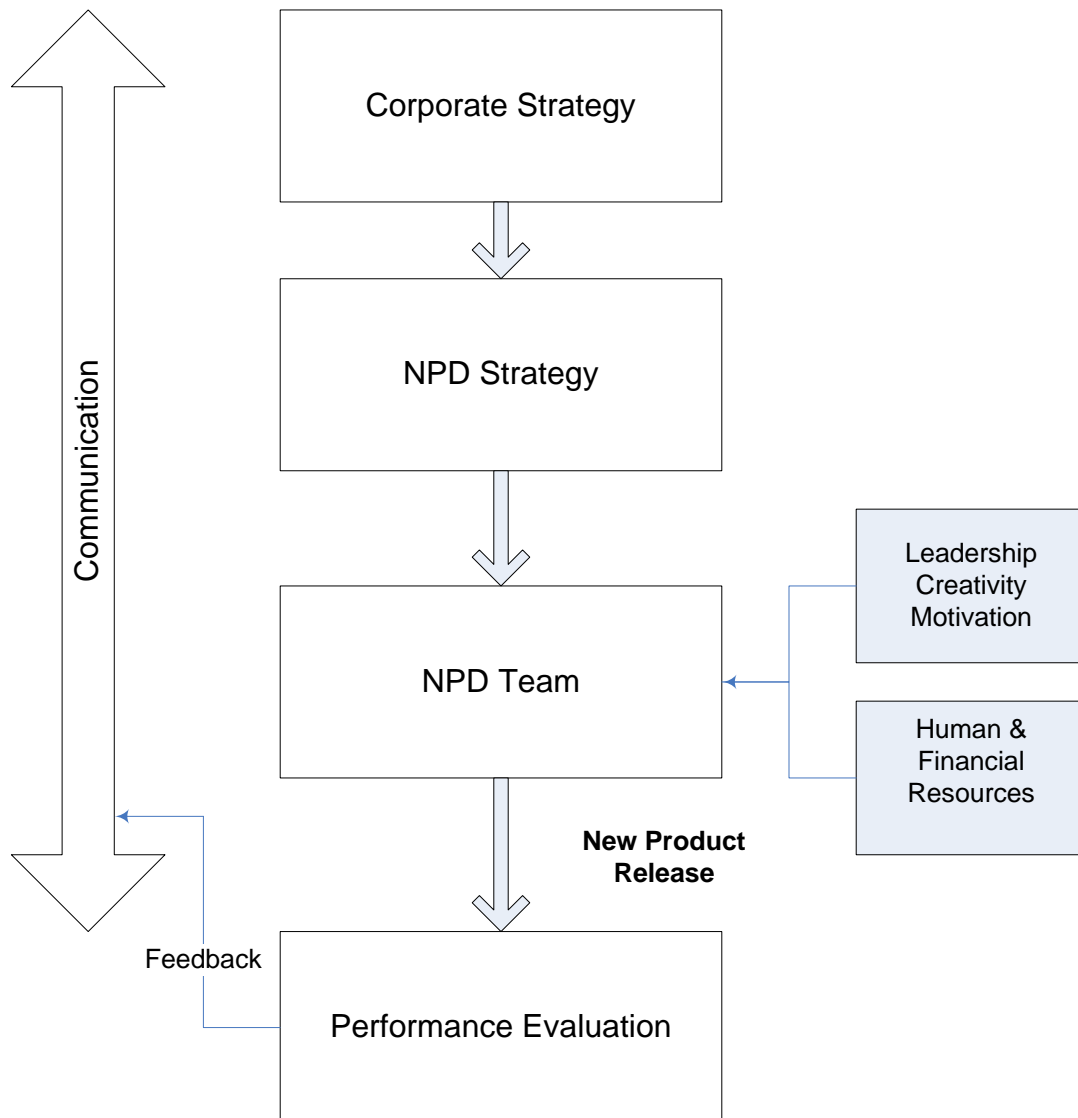


Figure-1: NPD Conceptual Model

In order to validate the above NPD model we propose a case study research focusing on the introduction of new products in the technology industry. The objective of the case study is to verify the hypothetical relation between the organizational strategy and behavior on the NPD success. The NPD cycle starting from conception to completion in select technology firms will be investigated in the proposed case study. We then analyze the data using strategy, leadership, creativity and motivation as the independent variables and the success parameters described in the standard NPD literature<sup>4</sup> as the dependent variables. The empirical study results along with our refinements to the NPD conceptual model presented here (Figure-1) will be published in a separate research paper.

## **Conclusion**

NPD activity in the 21<sup>st</sup> century is moving beyond the realm of basic market studies and simple engineering techniques. Globalization, information explosion, outsourcing, and the increasing use of high technology are affecting the development of new products. These aspects provide exciting research opportunities to the NPD research community. Understanding current business trends enables global corporations to devise suitable strategies and satisfy the needs of informed customers using sophisticated technologies. This paper provides the platform for a case study regarding the introduction of new products in high technology firms. In our future research, we will present the results of a case study research evaluating the challenges and offering possible solutions for addressing NPD activity in a global technology environment.

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## **Biography**

Srinivas Adavikolanu is a Ph. D student in Applied Management/Decision Sciences at Walden University. Research interests include business strategy, mergers, and acquisitions in the technology industry. He has a Masters' degree in Chemical Engineering from Indian Institute of Technology/New Delhi, India. Employed: Engineer at Hewlett-Packard Company/Boise, Idaho.

Raghu Korrapati, Ph.D is a faculty in Applied Management and Decision Sciences Program in School of Management at Walden University, Minneapolis, MN, USA. His email address: rkorrapa@waldenu.edu