

A Model for Formulating a New Product Development Strategy in a High-Intensity Industry

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Abstract

The shortening of the average product cycle, intense competition at the marketplace, and rapid change in technology has created an environment where growth and profits of the firms depend on new product development. New product development has become a key element in developing a competitive strategy. New product development decisions involve large investments and are based on the profitability and long-term value for the company. The products in the technology-based industries have become so complex that the industries have changed their production strategy from manufacturing to sub-assembling the products. New product development at the firm level requires research and development at the suppliers level. The supplier has to become partners in the firm's growth strategy. The purpose of the study was to investigate the process of new product development in the high-intensity industry, analyze the firm and supplier involvement in the new product development, and develop a model for formulating a new product development strategy for the high-intensity strategy. The proposed model links the firm, supplier, technology growth, and the business model for developing a long-term new product development strategy. Rapid technological changes and intense competition in the high intensity industry provided an excellent opportunity to investigate the new product development process and the supplier's involvement, and the proposed model would be helpful for the management in formulating a long-term strategy to create value for the stockholders.

Introduction

Growth is essential for the survival of the firm at the marketplace and for creating long-term value for the stockholders. If there is no growth in business, the survival of the firm is at stake, and there is chance that firm may go bankrupt. Management is constantly looking for growth opportunities to fulfill the demands of the stockholders for a fair rate of return, and to maintain market share, and create a competitive advantage at the market place. The stockholders, who are the owners of the company, are constantly looking for growth through an increase in stock price. The value (stock price) of the company is determined in a financial market based on the future cash flows of the firm. The future cash flows depend on the firm's ability to compete effectively at the market place, and the competitive efforts to generate revenues greater than the cost. Competition at the product or service market place is like a

battlefield (war zone). The shortening of the average product cycle, intense competition at the marketplace, and rapid change in technology has created an environment where growth and profits of the firms depend on new product development. The firms constantly need to formulate growth strategies based on the overall growth of the industry and the ability to capture a portion of the competitor's market share by introducing new products. Industry growth is an opportunity to the company and the cost of matching the industry growth strategy is usually lower than the cost of capturing the existing market share of the competitor. A growth strategy based on new product development involves large investments and has significant impact on the long-term value for the company. The growth strategy of the firm differs from industry to industry based on the characteristics of the growth.

The industries are classified by their characteristics. The general classifications of the industries are negative growth, zero growth, emerging growth, constant growth, variable growth, and high growth. In the high growth industry, the growth may be further classified as high variable growth, and high intensity growth. The high-intensity growth is the result of rapid change in the environment and at the marketplace. In the high intensity growth industry, the speed of change is very high in both the industry's efforts to develop new products and the customers' efforts to adapt to new products. The high-intensity industry includes characteristics such as knowledge based design, changing technologies, information (data, text, voice, and image) components integration, communication network integration, short product life cycle, intense competition, and product or service integration with other industries. The complexity of the products in the high intensity industry requires sub assembly of products rather than manufacturing. New product development at the firm level requires research and development at the suppliers level. The firms in the high intensity industry have to collaborate with the suppliers and make them partners in the firm's growth strategy because suppliers are part of the intensity in the industry. An industry may be classified as a high growth industry, but it does not meet the intensity test because the growth is not the result of both the industry's effort for innovation and the customer willingness to adapt quickly to new products. The growth that is based on the technological changes, increase in intellectual assets, changes in demographics, and has a longer product life cycle is not referred to as a high intensity growth industry. The industry that includes data, text, voice, image, knowledge, and communication networks has a shorter product life cycle and is referred to as a high intensity industry.

The purpose of this study is to analyze the environmental variables and the new product development process, and develop (propose) a model for formulating a new product development strategy in a high intensity industry. In a high intensity industry, there are unlimited opportunities to explore the new product development through product integration. The changing technology provides innovative and creative solutions to customer problems in the high intensity industry. An industry like this provides an excellent opportunity to analyze the environment in which the industry operated and develop a model for formulating a new product development strategy. The new product development is a key element of the competitive strategy, involves large investment, and a failure of the product at the market place will severely affect the company's profitability, growth, and the value of the firm.

Research Problem

Growth is essential for the business to survive in a competitive market. The growth in business is generated by expanding the company's product line, entering new markets, merging with another company, acquiring another company, forming alliances with another company, or developing a new product. The new product line, new markets, mergers, acquisitions, and alliances are considered strategic decisions and there is no specific model available for making managerial decisions. These decisions are made at the corporate level, and takes into account both the internal and external environments of the firm. There are models available for new product development that involves functions such as marketing, research and development, engineering, and production operations (Cooper and Kleinschmidt, 1991). The problem with this approach is that the development process does not include continuous involvement of both internal and external variables in the product development. Also, the development process does not focus on the business model, and strategic focus of the company. The search of the database shows there is no current research on developing a model that takes into account both the internal and external environments in the new product development process (NPD). The NPD usually involves a large investment in research and development, and production operations. The failure of the new product at the market place will result in huge investment losses to the firm, loss of market share, and decline in the value of the firm. It is important for the firm to adopt a new product development process that will create a competitive advantage at the marketplace, and in turn increases the value of the firm. The goal of the research is to analyze the current new product development models and propose a model that includes both internal and external environments, business model, and the strategic focus of the business.

New Product Development

Growth is essential for the survival of the firm. It is also a challenge to most of the firms (Hamel and Getz, 2004), and in a dynamic industry firms need to generate innovations while reducing development time and controlling cost (Kim and Mauborgne, 2004; Cooper and Edgett, 2005) to generate growth. Several studies (Cooper and Kleinschmidt, 1994; Kessler and Chakrabarti, 1999; Liker et al., 1999; Sethi et al., 2001; Troy et al., 2006), focused on NPD structure in the past and still there is no clear direction or a universal approach for successfully developing a new product. Cooper and Kleinschmidt (1991), Griffin (1997), Calantone and Di Benedetto (1988), McDermott and O'Connor (2002) recommended a series of steps such as sequential tasks, stage-gate processes, or some systematic process to reduce risk and increase the success of the new product development. Millson & Wilemon (2002), Shepherd & Ahmed (2000) suggested that stage gate process will reduce time and increase the probability of success. Cooper & Kleinschmidt (1995) suggested that structure process should be adopted in the new product development process, and introduced flexibility by suggesting that stages can be skipped or combined to improve the success of the process. The structure process still remained the integral part of the NPD process. Moorman & Miner (1998) suggested that improvisation can have a positive effect on new product outcomes. In improvising the NPD process has no structured task and the NPD team improvises the project as the project progresses. Most of the researchers in the past suggested the structure approach for successful product development. In recent years, researchers have introduced flexibility in the NPD process. The problem is the product development process differs from industry to industry and the structure has to be changed with the changing environment. The review of the literature shows that there is no

specific model available for developing a new product in the high intensity industry. The goal of this research was to review the existing literature and develop a model that meets the requirements of the high intensity industry, and provides NPD teams a tool for successful development. The high intensity industry requires constant understanding of the environment technology, economy, political, legal, and socio-culture elements of the environment. Also, the success of the product at the market place is based on the business model, and it is important to include the business model in the NPD process. Based on the review of the literature, and the analysis of environment surrounding the high intensity industry, a model NPD was developed.

The New Product Development Model

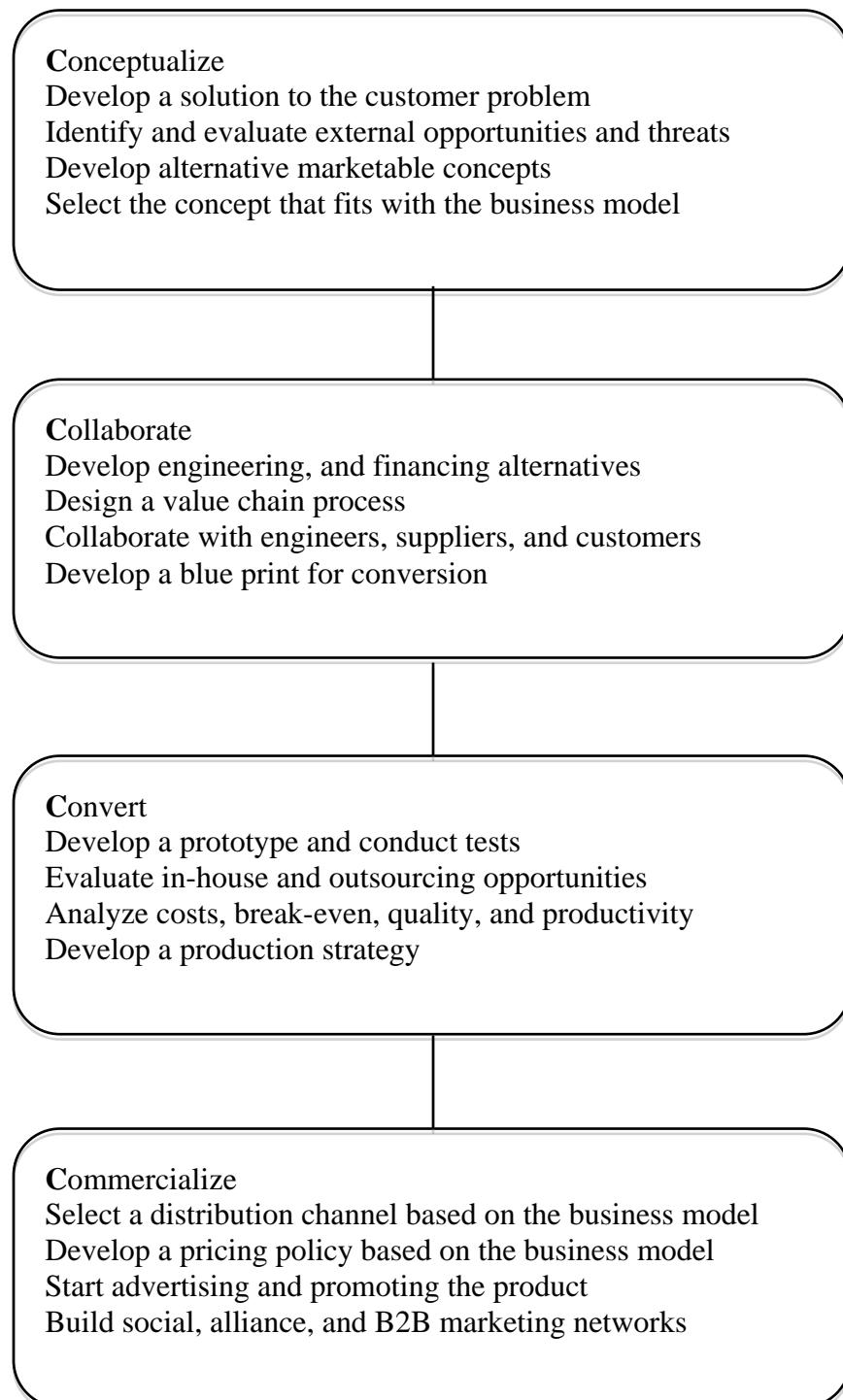
The proposed model suggests that NPD is a systematic process and involves interaction between various functions in the organization and takes into consideration environmental factors, suppliers, and the business model in developing a new product. This model is a break from the traditional thinking that it is the function by itself and there is an end to the process. The proposed model suggests that NPD is a collaborative effort and it is a continuous process with feedback. The feedback is essential to learning how to improve the NPD process and attain success at the marketplace. This model will help the firm in introducing new products that are designed to solve a customer problem, minimize cost over-runs during the development process, and lesson the chances of termination of the new product.

The proposed NPD model includes four stages, and the four states are referred to as 4C's of NPD. These four stages of the model are: 1) Conceptualize, 2) Collaborate, 3) Create, and 4) Commercialize. The conceptualization stage includes formulating solutions to the customer problem, and based on the best solution for the customer several concepts are developed. To determine the feasibility of the developed concept, the firm needs to analyze the external environment that includes technology, economy, political and legal, and social-culture variables to identify the opportunities and threats to the proposed concept. Based on the opportunities and threats from the environment, few marketable concepts are developed. The marketable concepts are then analyzed to determine how they fit with the business model. Based on the best fit a concept or two will be selected and enters the second stage, the collaboration.

In the collaboration stage the concept or concepts are analyzed by both engineering and finance to identify the best available choice that can be engineered and financially feasible to produce and create wealth for the stockholder. A value chain process is drawn to collaborate design, engineering, finance, suppliers, and production operations of the organization. The collaborative efforts will result in a blue print that will used to convert concept, design, and efforts of the collaborators into a product. In the convert stage, a prototype is developed using the blueprint and is tested in the laboratory for the success in solving customer's problems. Also, a market test is conducted to determine how the customer perceives the proposed solutions to the problem. Based on the feedback, the firm will be able to make modification to the new product and begin the full-scale production. Next, the firm will decide whether to produce or out source the production of the new product based on the available opportunities. At the same time a break-even, quality control, and productivity is conducted to formulate the best production strategy for the new product. Once the product plans are prepared, the next state is commercialization of the product. In the commercialization stage, the firm will analyze all the

distribution channels and select the one best fit with the business model. A pricing policy is selected that will align with the business model and the cost recovering strategy of the firm. The firm starts the advertising and promotion and communicates with the customer the value of the product, and its ability to solve the customer's problem. In addition to advertising and

New Product Development Process



promotion, the firm will build social marketing, alliance, and build complementary business marketing networks. The model provides a systematic approach to new product development process in a high intensity industry. It is based on the assumption that NPD is multifunction activity, continuous, collaborative and based on the company's business model.

International and Managerial Implications

New Product Development is the critical factor in the growth and survival of both domestic and international firms. Management needs to understand that the NPD process is not a functional decision, it is a multifunctional decision. NPD is not a mere incorporation of new technologies and design, and test marketing. It involves a model that is capable of incorporating internal and external environment, firm's strategic focus, and participants from other industries to develop a product that will contribute to the growth of the firm. A model based approach NPD will help management in understanding the potential success of the new product at the market place and its impact on the firm's cash flows. Also, it will allow management to minimize the investment risk exposure in the NPD process by providing information that is necessary to make management decisions such as modification, or termination of the new product during the development process. In this global technological environment, NPD involves integration and assembling of components from several suppliers from different industries. A model-based approach will help the management in understanding the potential growth from the product based on the life cycle of the new product.

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