A PRESCRIPTIVE MODEL FOR NEW PRODUCT DEVELOPMENT: A CASE STUDY

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Abstract

Regarding the high importance of NPD in success of companies and worrying rate of product development projects failure in world and Iran, the aim of this research is to introduce a model for effective product development process in Iranian companies that are active in FMCG industry and their brand aren't so powerful. In this research, by using case study method and triangulation in data gathering phase, Ramak Bita Co. in Iran has been studied. In this company, by different methods like participative observation, documentary analysis, and semi-structured interviews, the prescriptive NPD process model has been defined. Then, emerged recommendatory model has been compared with existing models of literature.

In fact the result of this research is a 12-step model, which some steps (e.g. taking legal permissions of new product, distribution channel training, and participative goal setting with distribution channel agents) are unique in comparison with existing models of literature. The reason of this difference is existing difference between the context of Ramak Bita Co. with studied companies of literature. Therefore, recommendatory model of this research is adjusted to the Ramak Bita's condition and can help Iranian Ice cream companies to solve one of their important problems.

Key words: New product development, Ramak Bita Co., Iran.

Introduction

The execution of product development programs and the successful launch of new products is getting more and more difficult year after year. According to new studies conducted by the Product Development and Management Association, almost 40% of new products fail at market (Adams, 2004). The success rate of new products, as well, is worryingly low. The failure rate of new packaged products (most of which considered as development of manufacturing lines) also stands at about 80 percent. Awa 2010, holds the idea that new products and financial services, such as; credit cards, insurance programs, and services also face the same failure rates. Cooper and Kleinschmidt 1993, also underline that some 75 percent of new products are doomed to failure right at the beginning. Havaldar (2006, p. 154) also has found out that some 30-55 percent of new industrial products and up to 75 percent of new consumer products fails at market. Balachandra 1997, points out that in 1991 over 90 percent of new products did not achieve their objectives. The issue of new products failure also applies to fast moving consumer goods (FMCG) in Iran, particularly to ice cream. For instance, up to 85% percent of new products of Ramak Bita co. do not achieve their sales targets. Although there exists a solid sum of theoretical issues on the topic of the research, the chosen topic is very important due to the failure rate of over 90 percent of product development programs, the doubling of new products growth rate in every five years and, the lack of a comprehensive execution model of product development for active ice cream companies in Iran. So the overall objective of the present study is to provide a process model, which fits the requirements of Ramak Bita.

Theoretical framework

Griffin (1997, P. 2) defines new product development as a set of tasks, processes and defined actions that materialize the sales and services objectives of a company, through converting its naturally premature (initial) ideas to products. Product development is a series of activities that begin with the perception of a market opportunity and end with the production and sale of the product (Hoffman, Kopalle, & Novak, 2010). The most common and the most popular model of product development, which has been the source of many future models, is the base model of product development by Booz, Allen, and Hamilton (1982). This model, which is still vastly in use, can be found in many sales and marketing textbooks and envisions the execution of product development process as a series of sequences of activities, through which a new product in the form of an initial idea develops to a final commercial objective (Figure 1).

New Product strategy => Developing Ideas => Screening Ideas => Development and Examination of Idea => Commercial Analysis => Product Development and Examination => Marketing Analysis => Introduction of Product

Figure 1: Product-based Development Model
Source: Booz, Allen, & Hamilton, 1982

Although such models are modified through inserting detailed sub-stages, Inter Departmental Functions, and decision points (e.g. Mowry, 2007 and Cooper, 2000); it seems that there are still some problems, which will be embarked on after identifying key steps of the common product development models of literature (Table I), and the critics reflected against them will also be elaborated.

Table I: Comparison of theoretical models in the product development process and process steps

Sources / Processes	(Awa, 2010)	(Kumar, 2009	(Crawford & Benedetto, 2007)	(Costa, 2007)	(Mowry, 2007)	(Ulrish & Eppinger, 2004)	(Cooper, 2000)	(Bessant & Fransis, 1997)	(Cooper & Kleinschmidt,1991)	(Booz, Allen, & Hamilton, 1982)
Strategy Identification						✓		✓		✓
Idea creation	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Feasibility studies and screening ideas	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Concept Development and Testing			✓	✓	✓	✓	✓		✓	✓
Presentation and edition of formulas	✓	✓		✓	✓	✓				✓
Market research and Determination of sales goals	✓	✓	✓				✓	✓		
Financial feasibility	✓	✓	✓				✓		✓	✓
Trial production	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Identification of marketing mix	✓									
Real test of market	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sales and controlling factors of marketing mix	✓	✓	✓	✓	✓	✓	✓	✓		✓

As illustrated, in most of the presented patterns, attention has been paid to the processes of idea generation, feasibility studies and screening ideas, concept development and testing, testing and revising of the formulas, market research and determination of sales goals, financial feasibility study, trial production, real test of market, and finally the sales and controlling of the marketing mix. It seems that most of the studied patterns have some common and different problems. These problems include lack of feedback loops, linear conceptualization of the process, lack of attention to simultaneous processes, a little attention to the early stages, slight attention to attention to uniqueness of the product development processes according to their different contexts, and their attempts to provide a universal pattern, and as well as not considering constraints and legal requirements.
According to the nobility of local research based on the social constructionist approach and postmodernism (Smith, 2005, p. 87, Rahmanseresht, 1978, p. 389), and the fact that the approach of the case study method is a constructionist one (Smith, 2005; p. 98), and that the objective of the researcher is to provide an indigenous model for product development; in this part of the study a review of the related literature on the our topic in Iran will be presented.

In 2009, Taheri conducted a research by survey method with the aim of identifying factors that influence product development. He announced that the influential factors were: buying the technical know-how and loans problems and banks' financial support, governmental regulations, capital requirements, culture and organizational structure, smuggling and uncontrolled importation of goods, and infrastructure.
Manafi (2010) reviewed the factors influencing the successful development of the products and highlighted the following factors as the most influential: the speed of the process (to minimize the production time), integration between departments, investment in Research and Development, use of value engineering in production, training, and advertisement.

Goodarzi (2011) in his thesis, done in a case study approach, presented the strategy and business model of research-based organizations as the following: stage of determining ideas (idea formation, evaluation and selection of an idea, conceptualization, approval of proposals); the research stage (conduction of research, making the prototyping or pilot, and prototype evaluation); the strategy selection stage (granting sales' privilege, establishing companies); the product development phase (increasing scale of product development, product review, mass production, sales); and the marketing and sales stage (continuous improvement, after-sales services). Saifi Golestan (2011) conducted a survey-type research on the impact of Information Technology on the development process of new products.
With regard to the research problem (high failure rate of product development projects), and the lack of research and product development models to suit food industry companies; the main research question is as to follows. How should be the product development process in the studied companies (the prescriptive model)?

Research Method

In the present study, the case study method is utilized since in order to find answers to the research question, the complex process of product development have to be studied more deeply. Then, the process improvement solutions should be discovered (presenting proposed model). The case study method should also be utilized in order to delve into a comprehensive and deep study of product development, which is not separable and distinct from its context. This is mainly because of the fact that this method is the best way to study the subject in depth (Eisenhardt, 1989) and would yet realize the theory-building purposes (Gersik, 1988, Harris & Sutton, 1986; Mc Lean, 2011, p 33; Yen, 2008, p 14) and would help to presenting the proposed model. Therefore, from the research purpose stand point, this study is a descriptive and prescriptive one, and from the research method stand point, present research is case study one.

In this section of the paper, the research stages are elaborated on in order. The site selection comes first. The site selection stage (case study) was done with regards to the potential of site to gather information, logistical considerations such as proximity and availability, and level of experience. General information of the company in this study, which was selected according to the above-mentioned criteria, is summarized in Table II. The study was conducted in 2012, when the researcher was in charge of the product development process and was involved in the implementation processes in company.

Table II. general Information of Studied Case

Company	Trade Mark	Age (Years)	No. of Personnel	Ranking in Industry based on sales	No. of Products
Ramak Bita Ice Cream	Ramak Bita	4	180	5th	58

Then, the problems and solutions of product development are identified separately. In data collection, in order to improve the accuracy of the data, the researcher used the Triangulation approach. Data collection methods to describe the current situation and finding the related solutions are: participatory observation, semi structured interviews with managers involved in the product development process, and reviewing related documents and written texts. Targeted sampling with theoretical saturation criterion was used to interview managers and experts. The interviewees' data are presented in Table III.

Table III. Information of Surveyed Individuals

Position	**No.**	**Average work experience**	**Holder of Bachelors' Degree**	**Holder of Masters' Degree and Higher**
Manager	9	5	4	10
Deputy and General Manager	1	10	3	3

In order to document data collection and to increase the reliability of data, researcher have used audio documenting devices (in the case of data obtained from interviews); visual documenting cameras and camcorders (in the case of data obtained from observation); and written documentation of emails, letters and other documents (in the case of data obtained from written documents).

To analyze data from interviews, observation and documents, theme analysis (Braun & Clarke, 2006, P. 80) is used. Accordingly, the key points contained in the text of the interviews, documentation reviews, and the researcher's reports of observations have been encoded. Then similar codes were combined into themes. Codes indicate key points, and themes of common code in each of the companies are shown in the table IV.

Table IV. Codes and Themes' Table of prescriptive Product Development Process in Ramak Bita Co.

Theme Code	**Theme**	**Codes**
RBPP1[1]	Identification Of Strategy And Position	PC11, PD10,
RBPP2	Establishing A NPD team	PC11,
RBPP3	Idea generation and Idea Screening	PB15, PD11, PC12, PA12, PB16, PC11, PA16,
RBPP4	Market Research	PB14, PD13, PA14, PC14, PA15, PB18, PC13, PD20,
RBPP5	Sales Targets and Product Demand	PD7, PC9, PB21,
RBPP6	Comprehensive and Financial Feasibility Study	PC14, PD19,
RBPP7	Test Production	PC11, PD16,
RBPP8	Determining Marketing Mix based on Push Strategy	PB22, PB17, PC11, PD17,
RBPP10	Launching and Monitoring The	PA17, PC11,

[1] Ramk Bita process phase 1

	Marketing Mix	
RBPP11	State Legal Constraints	PB6, PB9, PB12, PC4, PC7, PE14,
RBPP12	Cost Reduction Process	PA10, PC11,
RBPP13	Setting the sales target and Training the Sales Force	PA11, PC11,
RBPP14	Formula Testing	PC4, PC7, PE14

After the creation of the themes, the themes' transformation into the process model of each company was done based on the general view of the researcher. The foregoing analysis was done separately. Ultimately, the model in Chart 2 (the final proposed model of the research), is analyzed and compared with existing theoretical models at the Conclusion.

Findings

The final proposed model will be presented as follows. Theme codes relevant to each stage of the proposed process are presented at the end of each stage.

The first step is to determine and announce the grand strategy of the company and forming a product development team (RBPP1, RBPP2). Second step is finding the idea through analyzing different insider and outsider resources and especially internal market leaders (RBPP3). The third step is the rapid feasibility study and screening of ideas by a multifunctional team to screen products according to criteria such as: compatibility with the company's ability to supply raw materials and packaging material; compatibility with the production facilities of the company; compatibility with distribution and sales facilities of the company; and compliance with the terms and legal restrictions. (RBPP3).

The marketing department should then conduct researches focusing on the analysis of competitors, potential market size, and consumers' intention to buy that new product (RBPP4). Then if the market assessment is positive, Research and Development Unit (following reviewing standard brochures) would embark on formulation and preparation of test samples. The prototype formula, then, will be revised in the Research and Development Unit based on customers' feedback. Consequently, the modified formula would be returned to the marketing department once again for yet another test to be performed on it outside the company. In case of disapproval of the sample, the cycle continues (RBPP14).

Following the completion of the formulation process, sales targets based on more accurate market estimates of future demand will be determined (RBPP5) in the sixth stage. In the seventh stage, the financial unit will be in charge of financial feasibility processes and providing a profit and loss forecast (based on quoted market prices and the amount of sales, and B.O.M. [Body of material] introduced by the Research and development Unit) (RBPP6). After these steps, it is possible to modify the formula, re-asses the feasibility, halt the project or to keep it running based on the outcomes of the financial feasibility process (RBPP6).

After the mentioned steps and if the production of the product is financially and market-wise positive, various processes are to be implemented in parallel to successfully ensure that the perquisites of production are met: the QC unit takes on the task of acquiring necessary authorizations of production such as production permit in 30 days, after taking many product designs into consideration, the marketing unit is set to select the proper product design and present it to the buying unit (After acquiring the necessary authorizations). The commercial unit is assigned to buy the necessary packing items (in accordance with the presented design from the marketing department), the necessary advertising material (according to the demands made by the marketing department), and the row material (based on the BOM presented by the R&D unit) all of which are to be ready in 90 days if imported and in 40 days if local. the technical-engineering department takes on the task of evaluating the possibility of production and organizing the production facility in 90 days (only if production does not require the purchase of any new production technology) (RBPP6). When the production facility is prepared, in order to identify the challenging problems of mass production, it is time for the primary test production (RBPP7).

After the steps explained above and at the 10th stage, the marketing mix which are based on the Push Strategy such as the retailer interest, reseller commission, etc. are defined to realize the selling point (RBPP8). Then at the 11th stage, the marketing mix is introduced to the agents of the distribution network, and the sales target is set for all branches, resellers, and company reps in categories. In addition one week before the product launching, sales team are trained (RBPP13). At the 12th stage, massive production is started along with testing the real market and introducing the market in a small town or district. If necessary, product is enhanced or even its production is fully terminated (RBPP10).

Discussion and Conclusion

The contribution to knowledge of this research is the somehow different pattern it presents compared to the available patterns in the theoretical fundamentals (table 1); differences which are mostly due to the variety of circumstances of the companies taken into account. Following the presentation of the items above, the restrictions and limitations, and the suggestions for the future researches are presented.

The differences and their reasons are as bellow:

1- Strategic type of Ramk Bita Co. is analytic, that's why imitation from competitors is the best way of idea generating, while in literature emphasis is on consumer needs analysis.
2- Models of literature, hasn't emphasis on building NPD team, but because of lack of that team in studied company, this researches' model focused of building NPD team.
3- Opposite to models of literature at the presented model, has been told that marketing research should be done after idea screening, because marketing research is time consuming and costly.
4- Because of governmental restrictions and limitations and necessary permissions, in compare with literature models, this research has emphasized on permissions and limitations, many times.
5- Because of brand oriented consumers in western countries, their models chose pull strategy as their marketing strategy, while in Iran most of the consumers aren't brand oriented and therefore distribution channel and availability are most important factors, and because of this reason marketing strategy of Ramak Bita Co. is pull strategy.
6- Marketing strategy of presented model of this research is push strategy, because of this reason this model in compare with the existing models of related literature, has more emphasize on sales target setting for all agents of distribution channel like sales reps., sales branches, whole sellers and so on.
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Generally, the specific restrictions regarding this research were: time limit, (time needed for case study research is more), impossibility of generalizing the model to all the companies active in the field of food industry due to the possible differences among them with Ramak Bita Co.

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