

Portfolio Management – A Case Study in the Food Industry

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Abstract: The product development process is considered a strategic function for the organizations. In order to survive and be profitable in a competitive environment, companies adopt portfolio management. It is expected that an organization will be able to prior projects and make strategic decisions by using portfolio management methods. However, implementing those methods is considered one of the most important barriers for the companies since there is a gap between theory and practice. Food industries face this barrier, but considering that their product development process and portfolio management have specific features, this object of study is of a great importance. This paper analyses the method adopted by one of the most important food companies in Brazil. Some maladjustments were observed for the specific situation and a dynamic method, System Dynamics, was suggested for portfolio management. The adoption of this method for portfolio management in food companies should be studied in further research.

Key words: Portfolio management, product development process and food industry.

1. Introduction

Considering the agrifood sector, AZEVEDO (2001) considers markets globalization as a cause of changes on strategic management of enterprises. Commercial transactions and information exchange among countries have turned possible the access to different types of food. This process has generated different tendencies of consumption as the called global food. This type of food is consumed in many countries, following the American lifestyle (Mizuta, 2000). Although global food is considered a strong tendency in the food market, customized products, that is, products adjusted to attend local needs, are also considered as reality for the agrifood sector in Brazil (Mizuta, 2000). Market segmentation should also be considered since different types of food are developed for different market niches. Healthy products as organic, light, diet and ready-to-eat food and smaller packaging for smaller families are some examples of segmentation. Besides, current variations of Brazilian economy, affecting costs of production and distribution, have led the food industry to operate in a very unstable environment. The great products variety and its continuous renovation are encouraged by the existence of different consumption tendencies. This situation brings about a high

number of developing projects. However, to deal with many development projects in an unstable environment demands effective management of the projects set. The management of the set of projects aligned with market and technological enterprise strategies aiming maximization of financial results is called Portfolio Management.

Product development process (PDP) and its performance are considered fundamental tools for an enterprise to be competitive in the market. The efficient management of this process makes possible to attract consumers and to guide productive processes according to the market and to existing technologies. According to Cooper et al. (1998) portfolio management might be the most effective way to prior projects and make strategic decisions related to these projects in an enterprise.

However, enterprises face cognitive difficulties at the moment they effectively invest in their Research & Development (R&D) areas and in resources for new product projects. The cognitive problems are caused by difficulties on visualizing (understanding) product development structure, that is, a systemic overview of the development process. The agents present a limited rationality about the interdependency of factors that rule the structure. The limited rationality arises because actions taken may not be perceived,

since they occur, in time and space, far from the agents who have caused them. As a consequence, learning is a difficult process for the organizations.

It is common that enterprises keep many different projects in course. They compete among themselves, so to prior projects is a difficult decision. As environment is extremely dynamic, where human, financial and technological resources are limited and information flows are complex, its management is considered a hard task. Thus, an enterprise portfolio management shall be considered a dynamic and complex (non-linear) system. In such system the efficient and affective decisions are much wider than manager common sense.

Therefore, recognizing that PDP is a fundamental process for enterprise competitiveness. Considering that its management makes possible strategic decision making and that this decision will be made in a dynamic and complex environment, it becomes fundamental the use of methods and tools in order to understand the process and reach expected results for the enterprise.

This paper has as main objective to evaluate the portfolio management process of a representative enterprise in the food sector and suggest adequate tools for its effective management.

The specific objectives are:

1. Identify challenges and problems in the portfolio management process of an enterprise in the Brazilian food sector;
2. Analyze the portfolio selection method adopted by the enterprise;
3. Identify main gaps between theory and application of the method in the considered enterprise; and
4. Make recommendations for the portfolio management process of the enterprise studied.

The paper was organized in four parts in order to reach these objectives. In the first part the main theoretical concepts, which are important for understanding the study, are presented. Secondary data were based on a bibliographic review about product development process and portfolio management. The methodology used, the case study, is presented in the second

part of the paper. Primary data, obtained through personal interview, are shown in the third part. Finally, results about the research, recommendations and suggestion for future studies are presented in the fourth part of the paper.

2. Theoretical Concepts

2.1 Product Development Management

The product development process is considered by the enterprises the most efficient way to reach sustainable competitive advantage in the long term when well managed (ILORI et al., 1999). The efficient management of this process may contribute to the enterprise's success or failure. CLARK and WHEELWRIGHT (1992) propose a framework for PDP management. This is presented as a “funnel” shaped framework where PDP stages are influenced by product/market and technological strategies (Figure 1). The stages proposed by the authors are described below:

◆ Development goals and objectives

In order to ensure coherence and consistency across strategies based on market and technology and to link them to specific business and development objectives, an enterprise must define its basic development goals and objectives. The purpose of the development goals and objectives stage is to provide integration both in the aggregate level and at the level of individual project. When these goals are clear and tied together then the strategies will generate the desired performance.

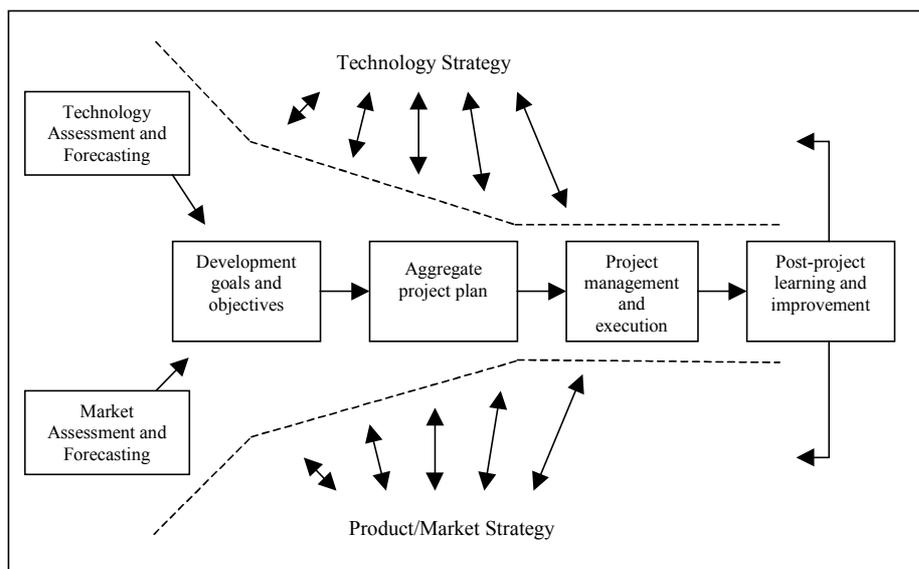


Figure 1: PDP Strategic Framework.

Source: CLARK AND WHEELWRIGHT, 1992.

◆ **The aggregate project plan**

The objective to create an aggregate product plan is to ensure that the set of projects will accomplish the development goals and objectives and build organizational capabilities needed for its success. This plan consists in turning available development resources compatible with demand.

The first step is to ensure that development resources are appropriately distributed among projects or mix of projects. These projects can be defined as: a) research or advanced development projects; b) breakthrough development projects (innovative projects); c) platform or generational development projects (bases for products families), and; d) derivative development projects. A fifth type can be distinguished as who is in charge of the work. Subcontracting should be included in the aggregate project plan.

A second step is to develop a capacity plan. In most organizations the demand or opportunities for development projects exceed the capacity of execution with available resources. That task demands an appropriate selection of projects and efficient use of available resources.

The next step is to examine the effect of the proposed projects on skills and capabilities required for future projects development, turning this process more competitive.

◆ **Project Management**

The management approach is part of the development framework. The management should integrate the aspects related to the initial project (strategies, measurable goals, objectives) and link them to the aggregate project plan and to the other elements of the developing framework. That is, individual project development should be efficient and linked to the plan and to PDP strategies of the enterprise.

◆ **Post-Project Learning**

The final element of development strategy is the post-project learning. Its goal is to ensure that the lessons available from each project are identified, shared and applied in future development projects of the organization. However, enterprises consider learning as a difficult task because of the prevalent view of how learning occurs and because of the failure in planning the learning across a sequence of projects. In order to turn learning into reality, the post-project stage of a development strategy must identify how, who, where and what will be learned.

Between each of the stages described there are points of review and control called stage gates. The projects are evaluated under technical and business approaches during the stage gates. These are fundamental in order to redirect projects or give up of them if they are not aligned with enterprise interests.

CHENG (2000) points out two approaches that are used in order to reduce the time-to-market: Concurrent Engineering and Front-Loading Problem Solving. Concurrent Engineering presents two essential features: non-linear product development process, which is designed to work in a concurrent way and a multifunctional product development team to carry out development projects (CLARK and WHEELWRIGHT, 1992). For this process, design parameters, productions parameters, and field-support parameters are integrated together in order to define a unified system. Thus, the development stages tend to be in a superposed arrangement leading to PDP time reduction. The second approach, Front-Loading Problem Solving, is based on a proactive focus, in which the concepts of problem solving integration and intersection are expressed in the development process (CHENG, 2000).

It is common that new products are derived from product families that share the same platforms in the food industry. Several advantages are described as: shorter development process; development process cost reduction; higher trust in the product; and it is a way to bring flexibility into business strategy (MUFFATO et al., 2000).

2.2 Portfolio Management

Portfolio management concept has first been used in the financial sector, when it was used to manage financial investments in an efficient way, aiming to reduce risk and maximize profits. Then, this concept has been applied to the organizations as a part of the PDP management. According to CHENG (2000) portfolio management is situated in a strategic level of product development: "...a permanent attempt to align market needs, technology possibilities and enterprise capabilities, in such a horizon that the continuity of the business will be reinforced" (p.4).

The same author indicates three objectives of portfolio management:

1. Strategic alignment of development projects with organization business strategies (market and technology),

considering two major aspects, functional strategies aligned with business strategies (specially market and technology) and development strategies aligned with business strategies;

2. To maximize portfolio value, considering available resources. Platform studies and development installed capacity studies are pointed out;

3. To balance projects, considering several criteria as alignment to enterprise strategy, competitive impact of technology, R&D cost, financial remuneration, etc.

COOPER et al. (1999) affirm that portfolio management is directly related to enterprise resource allocation, searching for balance between risk versus reward, maintenance versus growth and short-term versus long-term new product projects. Besides, enterprises should look for the right mix of long-term and short-term projects, so there will always be projects about to become a new product (ROZENFELD et al., 2000).

These authors propose a formal definition of portfolio management. They consider it as a dynamic management process, in which a list of active new product development projects is continuously reviewed and updated. This process evaluates, select and prior new projects, and allocates or reallocates resources to active projects. Portfolio decision process is characterized by uncertain and changing information, dynamic opportunities, multiple goals and strategic considerations, interdependence among projects, and multiple decision-makers and locations (COOPER et al., 1999).

The portfolio decision process encompasses or overlaps decision-making processes within the business, including periodic reviews, decisions about killing or carrying on projects, and developing new products strategies according to the decisions about resources allocation. Each enterprise functional area tends to understand portfolio management in different ways. Thus, it is considered multifaceted and complex, but vital to new products success.

Many problems about product development in an enterprise are related to an inefficient portfolio management. COOPER et al. (1999) points out some common problems faced by the enterprises:

◆ Reluctance to kill projects, leading the enterprise to deal with many projects and, consequently, low execution quality. The results are long time-to-market and high rates of failure;

◆ Non rigorous decision points lead the enterprise to develop many low value or/and poor projects, while good projects do not receive attention;

◆ Non objective selection criteria, based on emotion or political decisions leading to wrong project selection, resulting in failures;

◆ Lack of strategic criteria for projects selection lead to projects that are not aligned with enterprise strategy. The result is high risk.

The most difficult challenge faced by organizations is to apply portfolio management to product development programs (COOPER et al., 1999). According to these authors, the portfolio management goals are hard to understand because of some reasons: confusion between traditional portfolio methods for business units resource allocation and the models for R&D for new product projects; very dynamic environment; projects in different stages of completion; recognizing that the resources are limited and that portfolio management is very important.

ROZENFELD et al. (2000) consider that an effective portfolio management must guarantee the adjustment among limited resources of the enterprises and clients requirements throughout efficient platform planning, combination of solutions and sharing module among different products.

In order to turn portfolio management process operational, different methods are presented. COOPER et al. (1998) affirm that in the past most of them were based on management and optimization techniques. Nevertheless the main problem was to reach optimization in an uncertain environment. Recently, some methods for portfolio management have been proposed. These include: financial models and financial indexes, which use economic viability analysis; scoring models and checklists, where projects are scored according to a variety of questions, resulting in project prioritization; probabilistic financial models; and behavioral approaches, which are designed to bring managers to a consensus.

Every method cited present advantages and disadvantages. The great challenge consists in to adequate a method to the needs of an enterprise. Industry characteristics and its institutional environment must be considered in order to face this challenge.

3. Methodology

The methodology used in this research was the case study. At first, a bibliographical research about the theme was accomplished. Books, journals, congress proceedings and other relevant publications were consulted. Then a descriptive study was applied, a case study. At this stage open questions questionnaire was elaborated for primary data assessment. The questionnaire was lead to people with competence in product development process and portfolio management areas of one of the most important food companies in Brazil. The enterprise is identified as Enterprise A. The interview was executed *in loco*.

4. Results And Discussion

4.1 Enterprise A

According to the ranking of the 100 biggest enterprises of Brazilian Agribusiness, divulged by FUNDAÇÃO GETÚLIO VARGAS (2001), Enterprise A was class classified among the five biggest agroindustries of the country in 2000. During that year, Enterprise A was among the first positions in the segment of frozen processed products and refrigerated products as poultry, turkey and pork.

It is characterized by constant innovation of the product portfolio. The company holds a great variety of products and, frequently launches new products. Around 10% of company's income comes from new products. Enterprise A assumes as business strategy to improve production of ready-made and semi-ready foodstuffs, deploying other raw materials besides chicken, turkey, beef and pork. Therefore, it invests in value added new products to be launched in the market.

In 2000, Enterprise A concentrated its major activities on the consolidation and optimization of capital expenditure made previously, on the acquisitions made over the last few years as well as on the efficient operation of its available resources.

In this context, the process of Product Development Process Management, aided by portfolio management, was formally implemented. Its objective was to align the product development process with Enterprise A business strategy. Enterprise A product development process management used to work in an informal configuration before the implementation of this process, leading to high rates of failure with new products.

4.2 Enterprise A – Product Development Process

The Enterprise A product development process is considered a strategic area for the company. It consists in an R&D department, which holds some areas as marketing, packing and engineering.

It is organized in four stages:

1. *Opportunity (Idea)* – market opportunities are identified and new product ideas and concepts are suggested during this stage;
2. *Viability* – at this stage the product and its production process are specified;
3. *Development and Investments* – an evaluation of the productive process takes place, that is, some key-points are verified as: technology required (own development or acquisition is necessary); equipment required for production process; inputs required as well as their suppliers; available hand labor and necessity to develop capacities. Thus, it is possible to analyze which are the investments required to launch a new product.
4. *Launching and monitoring a new product* – during this stage the new product is launched and monitored about its market performance, that is, product sales and consumer acceptance.

Around 70% of the projects proposed became, in fact, new products launched in the market at the time the research was performed. Most part of the other projects was “killed” at the first stage of development. The senior management is responsible for the decision processes, the “stage-gates”. These processes are very important since the more a project advances in development, the more it costs in terms of financial, time and hand labor resources. The food industry differs from others, as automobilist industry, because of the high rate of proposed projects that became, in fact, new products. This is due to the low cost of projects development, especially when new products are line extensions or market reallocation. Besides, the timing between ideas and launching is relatively short. For Enterprise A this timing is around 24 months. Nevertheless, short development time does not guarantee good market performance. The short time only elucidates the reason why evaluation criteria are usually not rigorous in the first stages of development in the food industry.

The teams involved in new product development projects are multifunctional and work in a “lightweight” organization team structure for small projects (line extensions) or “heavyweight” organization team structure for complex projects (innovative projects).

Products are organized in families and subfamilies in Enterprise A. The families consist in platforms that use the same technological basis to develop several products. That is, small variations and derivations for new products are made.

Most part of new products launched are line extensions, these products do not require expressive changes in production lines or equipment acquisition. Other products are reallocated in market niches. New packing patterns or size are examples of these products. Around 10% of on hold projects in Enterprise A are innovative or radical products.

Enterprise A has adopted the methodology Quality Function Deployment (QFD) as a basic tool to structure the PDP management. This methodology consists in converting consumer requirements in characteristics of product and process quality. The company was able to integrate the areas of marketing and manufacture to PDP by using this methodology. The methodology is usually applied to complex projects and innovative and radical products in Enterprise A. QFD implementation has represented an important role in product development structure and its linkage to other functional areas and to business strategies of the enterprise.

The company does not adopt formal concurrent engineering. However, the project teams are multifunctional and there is certain level of integration with suppliers during Stage 3 – Development and Investments – of the development process. Thus, these characteristics allied to those that are inherent to food-processed products, contribute to shorten the time-to-market.

4.3 Enterprise A – Portfolio Management

The process of portfolio management implementation started in 2000. Many reasons lead the company to start the process. The most important was the high rate of frustration of expected sales of new products launched in the market. As cited previously, the costs involved in the product development process in the food industry is relatively low and the time-to-market is relatively short. So, in order to keep its innovative position in the market, Enterprise A adopted the policy to launch many products in the market

before the implementation of portfolio management. However, the products did not bring the expected market performance. Therefore, the adoption of strict criteria of proposed and on hold projects selection became a necessity.

During the process of implementation the managers identified some barriers. Senior management did not recognize the benefits that portfolio management could bring to product development process of Enterprise A, besides they were not deeply involved. These barriers are justified by the lack of knowledge about the potential of the tool to improve product development process. Linking different interests from different clients also consists in an important barrier. Enterprise A attends diverse clients who demand different product conformations. The cited barriers imply that portfolio management is not prior to Enterprise A.

Although portfolio management process was undergoing the implementation process at the moment of the research, some benefits were already observed as shorter time-to-market and better criteria basis to select and conduct new product development projects. Before portfolio management implementation, almost every product idea identified by the marketing area became, in fact, new development project. That led to “killing” projects when they were in advanced development stages. The consequences were waste of invested resources and poor utilization of development capability. Besides, that implied in launching many products that did not correspond to expected sales.

After portfolio management implementation, around 70% of the ideas proposed became development projects. Enterprise A considered it a great advance since R&D department was able to improve the utilization of available resources and to direct efforts to projects that were aligned to its business strategy. Besides, R&D department could effectively evaluate development projects and keep focus on the most important ones. Enterprise A recognized launching products risk sharing as the most important benefit of portfolio management implementation, since different functional areas were involved in the development process.

The portfolio management method adopted by Enterprise A is a scoring model based on a list of criteria and income expectation. The criteria are rated and scored by a team. After the evaluation, a punctuation is achieved by each project, what turns possible to prior them. Enterprise A considers the method efficient because it allows risk sharing

since the evaluation team is composed by people from different functional areas. The method also brought the development teams into a strong commitment with projects success.

Even though the scoring model is periodically revised, it consists in a static method, which is not able to capture technology and market changes that occur through time. Changes as currency exchange instability do not influence the priority ranking unless new scores are attributed to the criteria and a new evaluation is performed.

Enterprise A expects that portfolio management will bring, in the long turn, reduced time-to-market since only “good” projects will be developed. It is also expected that projects will be aligned with the enterprise business strategy, resulting in well-succeeded new products. Thus, the company will keep its innovative image in the market by launching new products in an effectively way.

5. Final Comments

Portfolio management is an indispensable issue for an effective product development process in enterprises. That becomes true in the food industry since product mix is, generally, very diversified. Thus, an efficient product development process is essential for the enterprises to keep their competitive advantage in the market. In this sense, portfolio management may contribute to raise the rate of good performance new products launched in the market since it promotes the strategic alignment of development projects with enterprise business strategy, maximization of portfolio value, considering available resources and the balance between development projects.

However, for the enterprise analyzed, portfolio management is sub-utilized. The lack of active involvement of the senior management and the method adopted were pointed out as causes of the sub-utilization of this management tool. The chosen method consists in a static analyzes that demonstrate punctual situations, that is, it reflects the moment when the situation is analyzed. External or internal changes are not perceived until another analysis is performed. The review is not immediate since it involves an evaluation team. Besides, it is necessary new score attribution to the criteria. From one hand, this method was considered inadequate for Enterprise A to prior its projects in an unstable environment as Brazilian. From another hand, other methods presented in the literature, as financial or

probabilistic models, also neglect aspects related to external and internal changes.

Therefore, the use of a method able to perceive changes in a dynamic way is suggested. The adoption of a dynamic simulation method, System Dynamics, is suggested (Forrester, 1961). This methodological tool is currently applied in different areas of knowledge. It turns possible to find dynamic implications to non-linear systems (Richardson, 1991), as the new product development process of an enterprise. The methodology uses computer simulation to relate the structure of a system to its behavior over time. So, it permits that the interdependent variables that influence the system are interpreted by using graphs that draw the variables' behavior interrelationships over time, helping the decision making process.

Formal simulation models can be constructed by using a friendly interface. After the validation of these models, they are considered "management flight simulators". Different actors of the system can share their opinions about the same problem or mental model through these simulators.

System Dynamics considers variables that are not traditionally considered by other methodologies – for example, currency exchange variations affecting inputs prices, governmental policies, demand variation, etc. – and are fundamental for understanding and making decisions in the product development process.

Although some difficulties are faced by Enterprise A portfolio management, it seems that its implementation has brought benefits to its PDP as development projects prioritization, development projects number reduction and risk sharing with different functional areas. Those turned possible to allocate resources to projects that were aligned to enterprise's business strategy, to focus determinate development projects and evaluate them in an efficient way.

However, it is suggested the replacement of the adopted method (Scoring models) by another one that are able to consider dynamic changes (System Dynamics), so that Enterprise A portfolio management process might become more efficient. Future research about the application of System Dynamics to portfolio management in the food industry is recommended. Besides, it is important to elucidate senior management about the potential of portfolio management as a way to collaborate to a better competitive position of the company in the market.

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