THE DESIGN OF NEW PRODUCTS[1]

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NEW PRODUCTS IN INDUSTRY

In the present article we speak of new products when referring to those which are new to industry, whether or not they are innovative. Thus, ours is an industrial outlook that is internal to industrial activity.

They are also named like this independently of their degree of novelty. Thus new products are those that are original and contribute new physical or perceptual characteristics, as well as re-designed or re-formulated products; in other words, those which vary some of its physical characteristics without altering its fundamental function. Even products that have similar physical characteristics but with a different image or percepcion on the part of the user, in other words re-positioned products, can be considered new and subject to a more or less similar problematic.[2]

The first thing that strikes us as obvious is industry's constant activity in generating new products, understanding these as those categories described in the previous paragraph. Both fieldwork as well as numerous references of studies carried out in and outside of our country confirm that the development of new products is a continuous function of most organizations.[3] This function fundamentally depends on the sector; it depends very little on the economic situation and even less on the size of the industry, although middle-sized industries are identified as tending to be relatively more active in this sense than large industries.

The second observation that can be made is the importance of the problems surrounding the management

1. The creation, development and market promotion of new products is a key area in all the organizations. The study of the phenomenon, its reasons, problems and measures in order to achieve a greater efficiency are the objective of the thesis of which this article is a part. In it, industries of three different industrial sectors are analysed: the toy sector, the textile manufacturing sectors and the small household electric utensil sector. All of them are important sectors in our country and, though very different, they have an important activity in common in the development of products. The analysis of our industrial reality has only come to confirm the formulated hypothesis, in other words, that in order to achieve an improvement in the process of developing new products it is necessary to carry out a specific type of behaviour which includes introducing a strategy that is adapted to the structure and conditions of the sector and a process of coherence with the capacities of the industry, subsequently in accordance with its competitive position within the sector. The description of the behaviour and results of the industries, one by one, along with the analysis of the industrial sectors within which they are framed and that condition certain general strategies, verifies the adequacy of the proposed steps, as has been previously mentioned. Therefore, the thesis contributes a practical, useful and operative method for improving the design and marketing of new products on the basis of the existing theory, professional practice and the empirical evidence obtained from the industries that have been studied.

2. This classification of new products is in agreement with numerous authors amongst whom we would like to point out Rothberg, R., *Corporate Strategy and Product Innovation*, Free Press, New York, 1981, and Chofray, D., *Développement et gestion des produits nouveaux*, MacGraw Hill, New York, 1983.

3. We would like to point out the study carried out in Great Britain during the industrial crisis by the British Institute of Management: Randall, G., *Managing New Products*, BIM Foundation, London, 1983.

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of new products, which can be summarized by the following two points: the high degree of failures and the cost of developing and especially promoting new products.

Insofar as risk is concerned, although the size of our sample does not allow us to conclude quantitative data, all industries have accepted a high degree of failures even in the case of products that have been successful in other countries. In certain industrial sectors the estimation of failure of new products reaches almost fifty per cent, and quantities considered to be normal are between thirty five and forty per cent for consumer products and between eighteen and twenty per cent in the case of industrial products.

In reference to cost, this obviously depends on the sector, industry or even the individual product, and even though it is difficult to give specific date due, amongst other things, to the lack of an adequate accountancy, we have obtained some significative data in relation to percentages and the estimated time taken for the development of new products, which indirectly is a measure of part of the cost that is undertaken. In the industries we interviewed the time taken is usually between one and three years.

In sum, according to general opinion, risk and cost are the most relevant problems in the process of developing new products. Nevertheless, the activity of innovating cannot be stopped or reduced since the stimuli for producing new products are fundamentally external to industry. If we closely analyse the reasons for the development of new products expressed in Figure 1, we will observe that only the last two, namely, financial objectives and a rise in sales, are a product of the active intervention of the industry, while the rest of the surrounding elements are not subject to its direct control.

Competence
Product's life cycle
Technology
Inventions
Regulations
Cost and disposability of materials
Demographic changes
Consumer's new habits
User's demands
Financial objectives
Rise in sales

1. Motivations for the development of new products. Source: our own elaboration according to the interviews carried out in the chosen industries.

If we reflect on future tendencies, the prevalence of these causes seems obvious. The rise in competitivity by way of new products, the growing diversification of industries, the maturity and saturation of markets, the consumer's change of habits, the user's growing demands, the rise of innovation rates and the pressure of governments and consumer groups in the regulation of products, are some of the tendencies that are already a reality and in the face of which the industry's attitude must be that of anticipating change and the management of innovation.

This analysis leads us to formulate the hypothesis that a reduction in the risk and cost of the development of new products passes through the formulation of a strategy and a planified process of design and promotion.

The hypothesis is reinforced if we closely study the variables that discriminate between the success and failure of new products presented in Figure 2.

Knowledge of the user's necessities	New product's process
Relation between the producer and the user	
Characteristics of the development process	
Foreseeable sales	
Marketing resources	Efforts in commercialization and development
Advantages of the product	
Post-sales problems	
Initial marketing problems	
User's formation	
«Market pull vs technology push»	Nature of the innovation
Industry resources and capacities	
Knowledge of the market	
Internal and external communication	Organization
I + D communication, design, marketing, production	
«Product champion» and high direction support	
Systematic planification	
Sector's maturity	Surroundings
Product's life cycle	
Role of the government	
Government economic support	

2. Variables that discriminate the success of failure of new products.

As can be observed, most of the variables are directly related to the process that must be followed, while others such as the development of capacities and human resources organization and knowledge of the user's necessities, are related to the strategy.

STRATEGIES FOR THE DEVELOPMENT OF NEW PRODUCTS

The analysis of the factors that explain the success or failure in the promotion of new products indicates that

having an explicit strategy for the development of new products is necessary in order to reduce the level of failures. This evidence is confirmed by various authors who affirm that new products cannot be treated as a simple piece of data and technology cannot be considered a resource of the industry to be used when it is convenient, but rather, these factors must be a part of the strategy.[4]

The development of new products is linked to the strategic plans of many industries helping to define its possible alternatives, as has been confirmed. For many of the industries in the sectors studied, new products are the central part of their corporate strategy. This is also true in other sectors: the rapid increase of an uncountable number of industries in sectors such as office computers, bioengineering, microelectronics and robotics evidences the potential of a well conceived strategy or new products. In the same way, many industries maintain their position thanks to a good choice of products carried out year after year.

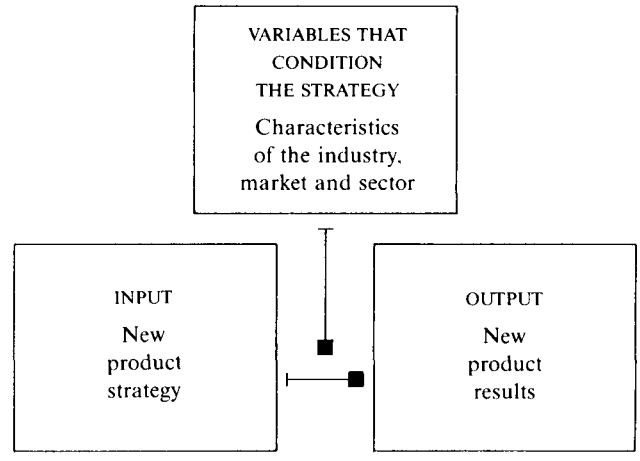
Admitting the strategic importance of new products, some industries develop strategies for new products as part of their corporative planification, as Crawford describes.[5] He states that many industries are beginning to define the strategies for new products basing them on the specification of the products, markets, technologies and orientation of the firm that is being pursued by the new product program.

One of the main problems in the strategy of new products is that very few theoretical and methodological contributions are made on the formulation and definition of strategies. The majority of strategic planification concepts refer to already existing products and markets. Concepts such as the Strategic Business Units (SBU), portfolio analysis, and the subsequent models of assigning resources refer to products or strategic unities that already exist. Certain indications can be extracted from these models, and it has been done in the thesis, but there still exists a vacuum in reference to finding a systematic process of generating and choosing strategic alternatives in new products or businesses.

The structure-behaviour-results scheme produces a starting basis for the formulation of a new product's strategy that agrees with many authors, amongst whom we would like to point out Cooper.[6]

The new product strategy (behaviour) determines the results of the industry, conditioned by the structural element of the sector and naturally by the other aspects of the firm's behaviour, as is graphically portrayed in Figure 3.

The strategy for new products is closely related to the industry's strategy as a whole, but it should be more specific. The strategy of new products in a firm should define the direction of the new product's program (for



3. The strategy chosen by an industry for its new products (input) determines the results (output) under the effects of the industry itself and its market or sector. Cooper, *op. cit.*

example, indicating what type of products, markets and technologies should be developed), the orientation or attitude (for example, being a leader or a follower, being aggressive or passive) and the priorities (for example, the I + D budget). The study carried out by Crawford identifies four large dimensions for defining the strategy of new products in an industry, and these are: type of product, activity of the ultimate user, type of technology used and type or class of the ultimate user.

On the other hand, in his article Cooper describes the strategy for new products by means of four blocks: the type of new products developed, the type of markets that must be reached, the type of technologies used and, lastly, orientation and priorities of the process.

The results that allow us to measure the efficiency of a strategy are several and varied, and amongst them the following should be pointed out:

a) Financial criteria: for example, percentage of sales generated by the new products.
b) Objectives: ways in which the program for new products reaches its objectives.

Urban and Hauser[7] reduced the strategies for new products fundamentally to two categories: reactive and proactive, both of them divided into other possible categories. This division is the one that has mainly been used in fieldwork and by which the industries have been classified.

An industry can have two types of strategies in reference to new products. One of them is to develop new products when it intuitively perceives that a change is going to take place or when it really perceives that a new product has been developed by its competitors.

4. Crawford, C. M., «Defining the Charter for Product Innovation», *Sloan Management Review*, Autumn 1980, pp. 3-12.
5. Crawford, C. M., *op. cit.*
6. Cooper, R. G., «The Performance Impact of Product Innovation Strategies», *European Journal of Marketing*, vol. 18, nº 5, 1984.
7. Urban and Hauser, *Design and Marketing of New Products*, Prentice Hall, Englewood Cliffs, New Jersey, 1980.

This type of strategies are the so-called reactive type, in other words, they react in the face of an external element. On the contrary, there are other industries that generate changes and are the first to innovate: these have a proactive strategy.

Reactive strategies can be of a very different nature. Thus we can speak of defensive strategies, which consist of competing with the new products that appear by improving or modifying already existing products without really creating a new product to substitute the original one. This would correspond to the most elemental state of novelty of a product: the repositioned product. Obviously, these strategies only have a short term validity if the original new products impose themselves. There are also imitation strategies, strategies known as «me too». These consist of copying or imitating the concept of the competitor even before knowing whether or not it has been successful. This is a common strategy in a large part of certain sectors where are very few innovators while the majority are followers. In the present study, the clothes manufacturing sector would be a clear example in which the majority of industries follow an imitation strategy.

A variation on the previous strategy is improving the competitor's product, being «second but better». The objective of this strategy is to be flexible and efficient in order to achieve a better product than that of the competitor without having to carry out the initial cost of development and experimentation. This strategy has been identified as being used by certain industries in the sector of small household electric utensils. Lastly, a typical reactive strategy is to respond directly to the necessities explicitly defined by the users. This is the strategy followed by many industries that manufacture intermediate products, thus responding to the specific demands of the client.

On the other hand, in proactive strategies the industry begins the innovation and benefits from the greater profitability derived from being the first, though logically with a greater risk. An industry can base its proactive strategy in two ways. One is giving priority to research and development, in other words, assigning resources to research and putting the results of this research on the market. The second is emphasizing marketing, in other words, developing only those products that respond to a necessity that has been detected.

Consumer product industries that follow a proactive strategy usually behave like this, while those of industrial products (chemical, steel and metallurgy, etc.) apply the first type of strategy. Nevertheless, numerous studies coincide that the majority of successful innovations have been generated from detecting the needs of the market rather than from inventions or discoveries carried out in research and development laboratories.[8]

One of the most proactive forms of developing products is what Urban calls the «entrepreneurial» form. It consists of enabling one person —the «entrepreneur»— who has an idea, to develop it thanks to the support («venture») of the organization, inside or outside of it. Some industries (the author quoted mentions 3M) have a «new venture» department that enables these opportunities to be carried out.

Lastly, another proactive strategy for incorporating new products is that of «acquisition». In this case, another industry is bought which has products that are new for the industry buying it and maybe even new for the market. The choice of one or other strategic alternative depends on the strategy of the industry and the structure of the sector. Both aspects are always a part of the different formal systems of choice of strategy.

In the industries we have analysed, the elements identified as being more relevant in deciding a proactive or reactive strategy are portrayed in Figure 4.

General strategy
Growth strategy
Protection to innovation
Size of the market
Competition
Power of the clients
Power of the suppliers

4. Factors that influence deciding on a proactive strategy versus a reactive strategy.

In general, the conclusions that can be drawn are that reactive strategies can be better in industries that[9]

— have a competitive strategy based on cost;
— require a greater concentration in the existing products and markets;
— can acquire little protection for innovation;
— have a market whose size does not allow them to recover from the costs of development;
— are in danger of being overcome by the imitation of their competitors;
— have an innovative role in the sector which comes from the suppliers or the clients.

On the other hand, industries can be proactive in their strategies for new products if

— their competitive strategy is based on the differentiation of the product;
— they follow a policy of growth or expansion;
— they want to introduce themselves into new products or markets;

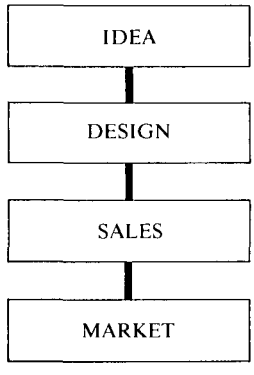
8. *The Conditions for Success in Technological Innovations*, OCDE, Paris, 1971.

9. The results obtained from the analysis of the different sectors and industries interviewed, reflected in the fourth and fifth chapters, fully coincide with some of the theoretical contributions, and especially with Urban and Hauser, *op. cit.*

— they have the capacity for acquiring registration trademarks and protecting the market;
— they can have access to markets with a large volume or a great margin;
— they have human and economic resources and enough time to develop new products;
— the competition is not capable of rapidly following up with a strategy of the «second but better» type;
— they have a certain degree of power in the channels of distribution.

THE PROCESS OF DEVELOPING NEW PRODUCTS

The process of developing new products, though apparently different for every industry, has numerous common traits. Simplifying, we would have two extremes, two model types. The first, represented in Figure 5, is a



5. Process of development without a strategy.

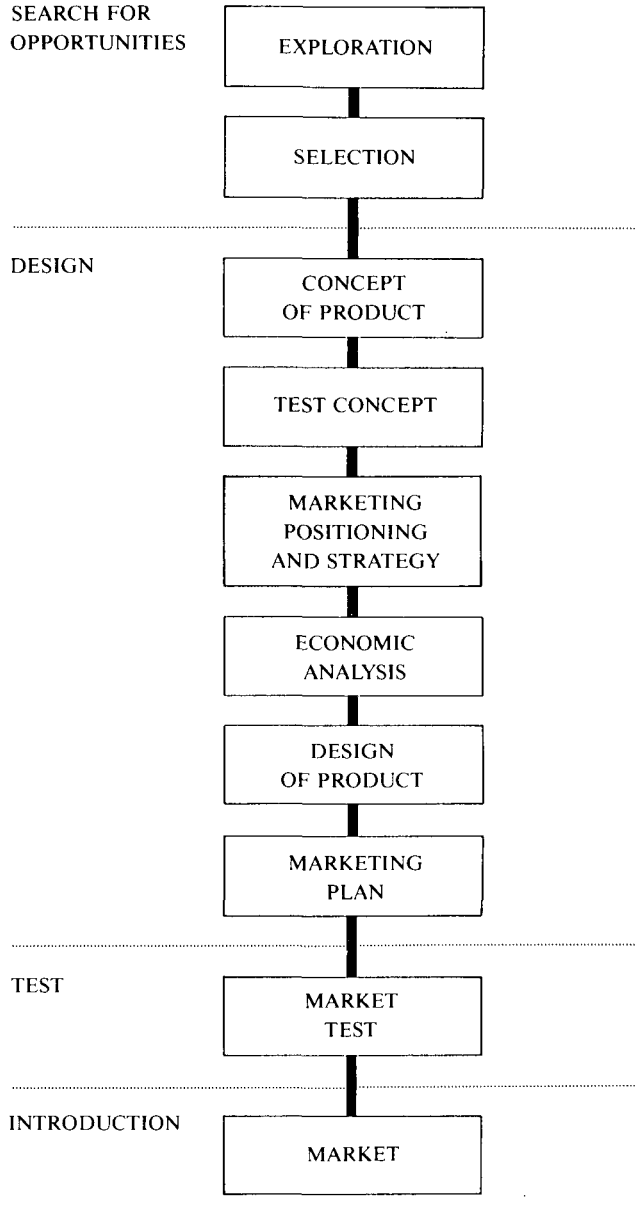
process followed by industries that lack a defined strategy for their new products. The results of these industries, measured by their position within the sector or by the admitted failure of some of their products, clearly indicates the flaws of this process.

The proposed model (depicted schematically in Figure 6) based on different theoretical contributions proves to be absolutely valid and is more or less exactly followed by the most relevant and exemplary industries, those with a better efficiency in the development of their products.

The process thus proposed, which is followed by some «excellent» industries, presents certain outstanding characteristics.

The first is the active search for opportunities and ideas versus the passive and reactive attitude. A systematic exploration that requires the definition of fields of research and, therefore, defined objectives and strategies. The selection of potentially valid ideas must be precisely carried out according to the aforementioned strategy.

The second is the conceptual amplitude of the de-



6. Proposed process of development.

signing phase or, in other words, the necessary phases previous to the actual projecting phase. Elements such as the definition of the concept of product or marketing positioning and strategy, presuppose that the product to be designed is precisely a variable that must be modelled and not a fixed data that must be commercialized at whatever cost. The concept of the product and the desired marketing elements in order to obtain greater precision, that is, a greater adjustment of the product to its market, are all a part of the requisites of design.

The third is the permanent reduction of the risk by means of explicit analysis such as testing the product, the market or the economic analysis itself. There are also implicit analysis such as developing an accurate marketing plan, before promoting the product, contain-

ing a definition of all the variables: product, price, distribution and communication.

Lastly, the proposed process tends to eliminate each and every one of the variables that discriminate between the success and failure of new products and which are described in Figure 2.