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# Dynamic Manufacturing Strategy Development for Proactive Manufacturing in Brazil<sup>1</sup>

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## Abstract

This paper is an attempt to outline the basic characteristics of a new method for the development of manufacturing strategy which is being implemented in a medium sized manufacturing company in Brazil. The new method has been developed because the ones found in the current literature were considered to be inadequate for the requirements of the highly changeable Brazilian industrial environment and also in order to provide formal means through which the manufacturing function of the company can have an effective proactive role.

## 1. LITERATURE REVIEW

In general, authors agree on the primary aim of manufacturing strategy which is to support the organization's achievement of a long term sustained competitive advantage.

According to most of the authors, the manufacturing strategy development should follow a top-down approach. Skinner (1985), Hayes and Wheelwright (1984), Hill (1985), Fine and Hax (1985) and Gregory and Platts (1990) suggest hierarchical models in which the corporate strategy drives the business strategy. This in turn drives the strategies of manufacturing and other functional areas within the business unit. In fact, the manufacturing strategy formulation process has not received as much attention as the manufacturing strategy contents - objectives and decision areas - in the literature (Leong et. al., 1990). Among the pioneers in the field, only Hill (1985) seems to have delved into a more detailed discussion on it, proposing a specific framework to guide the development process on a step-by-step basis. Rather, the authors in the field tend to focus their work primarily on the manufacturing strategy objectives and decision areas. This approach, according to Leong et. al. (1990), seems to consider some sort of implicit process, which depends on breaking manufacturing down into a number of decision areas and making the goals of manufacturing explicit in terms of a number of performance criteria. The steps of identifying these criteria, prioritising them and relating the decision areas to them would form the implicit process. Hayes and Wheelwright (1984), for instance, although describing four stages along a "continuum", which represents the evolution of a firm's manufacturing strategy, where the key aspect of evolution is the increasing, more proactive involvement of manufacturing in the firm's strategic needs, do not describe how a company should go about reaching the more advanced stages.

A number of authors (Gregory and Platts, 1990; Jouffroy and Tarondeau, 1990 among others) who have recently addressed the manufacturing strategy formulation process seem to prefer an approach which can be called the "audit approach". They have not given up the "break down approach" but they have merged it with the idea of auditing. The audit procedure aims at guiding the user through a logical process of identifying objectives, measuring current performance, determining

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the effect of current practices and identifying where changes are required. It helps the user prioritise actions but does not change the basic top-down approach.

## **2. THE MODELS FOUND IN THE CURRENT LITERATURE : THE INADEQUACY FOR THE BRAZILIAN ENVIRONMENT**

### **2.1. The company in study**

The company (called here "Company A") in which the framework is being developed is a medium sized (around 100 direct employees) family business, manufacturer of plastic promotional goods having among its customers mostly large companies. There are, broadly speaking, two types of competitors of Company A, in the market place: low-overhead backyard manufacturers and medium sized factories which in general have a similar structure to Company A's. Company A is currently going through a process of professionalization of its board of directors, formerly composed only of family members. The newly appointed General Director, although being part of the family, is a young Manufacturing Engineer who decided to reformulate the way in which the company have been strategically managed. One year ago, when he took over the position, he found a situation which can be considered, to a certain extent, representative of many medium-sized family businesses in Brazil: poor delivery records, quality problems reflected in high levels of substandard final products (reaching 30% for some items), low profit margins and generally long lead times, which had largely been a result of a number of managerial problems such as lack of strategic direction for the business as a whole and particularly for the manufacturing function, a consequent lack of manufacturing focus (one off orders for special high quality trophies, for instance, frequently competed for the same facilities with large standard quality promotional orders of thousands of products), poor inter function communication, "can't say no syndrome" of the manufacturing managers (who are very proud of it), among others. It was then decided that a new method for the manufacturing strategic planning process should be developed since the lack of an adequate manufacturing strategy was considered as the most serious problem faced by Company A and also because of the potential of manufacturing as a diffuser of new ideas within the company due to its many interfaces. A survey of the literature on manufacturing strategy development soon showed that the methods already developed, although valuable, did not seem to be adequate for the environment of the firm in study. Some reasons for such inadequacy are presented and briefly commented below.

### **2.2. Change is a central concept in managing organisations in Brazil**

Recent research work developed by Professor A. Fleury, from the University of São Paulo, Brazil (to be published), identified a tendency among a number of multinational companies of sending executives over to their Brazilian branches in order to be trained in managing under very unfavourable conditions. Brazil has been considered a training "lab" for uncertainty and unfavourable conditions.

"It is very difficult to make plans in a situation so uncertain and unstable" - says one of Company A's directors - "by now we reached a situation in which everybody is content because we have 'only' 25% inflation *per month*". In fact, in recent years, the high inflation has forced the government to take measures (the so called "economic packages") and frequently change policies with regard to a number of issues such as subsidised credit, exchange rates and taxes among others, normally in a sudden and unannounced way. Two years ago, for instance, in one of such packages, the Minister for Economy "froze", by decree, all the current accounts, deposit accounts and investments of all the people and companies. Overnight, Company A, as all companies, were notified that they would have to operate with only 20% of their previous amount of cash. The rest of the money would be made unavailable for 18 months and then returned to the owners in 12 monthly instalments. "The sudden and sharp changes

in government policies are the rule, not the exception any more", says the Director. "We have no choice - in order to survive we have to master the art of fire-fighting". Because of the large amount of influence the government has over the economy, normally all the players in the market-place are severely affected by the measures. It is very difficult for companies to forecast sales because, with high inflation and changing policies, if the mechanisms of wage adjustment for inflation are not effective, the purchase power of the consumers can be eroded drastically in a few months. The same way, the changes in the policies with regard to imports, such as import taxes, can make foreign competitors suddenly become more competitive in the internal market. Changes in the exchange rates can also make Brazilian products more or less competitive in external markets overnight.

Responding effectively to change seems to be therefore a dominant part in the manager's activities in Brazil. Any framework which aims to be effective in supporting the development of manufacturing strategy in Brazil has to consider *change* and *responding well to change* as central concepts. By analysing this reality and at the same time bearing in mind the models found in the literature, some aspects started to emerge as necessary for the development of a framework to help the development of manufacturing strategy in Company A:

a) The changes are so frequent and relevant that change should be the main trigger for the replanning process rather than only time, as the literature generally suggests. Company A cannot afford to wait for, say, 6 months to alter its strategic direction, once a relevant change has happened.

b) The changes are so frequent that not only two states - initial and final - as normally gap analysis methodology suggests, should be considered, but also the dynamic path through which the company should go about reaching their goals should be considered.

c) The changes may affect so many functional areas that it is impossible that just one or a few keep them under control. Each and every function should adopt a proactive attitude, trying to anticipate changes and think contingently about possible future changes with regard to its main field of interest. In the literature, although most of the authors advocate the need for proactive manufacturing, most of the frameworks suggested are, in fact, almost totally up-down. No formal means for the manufacturing function to exercise its contribution proactively seems to be provided. They seem to rely solely on people's attitudes in order to make the manufacturing "proactivity" to happen. It seems to be risky, though, to assume that managers will assume a proactive attitude in the short term, mainly in environments as turbulent as the Brazilian market-place, in which the manufacturing managers have historically had basically a reactive role.

d) Breaking organisational barriers is absolutely essential for the company to adapt and respond effectively and as a coherent whole to such environmental changes. Although the authors broadly agree that breaking the inter-function barriers within the organisation is necessary, when one analyses some frameworks found in the literature, such as Hill's (1985), for instance, one has the impression that there are only two functions within the organisation: marketing and manufacturing. The strict adoption of such a framework may represent the risk of repeating one of the basic mistakes which triggered the whole manufacturing strategy "movement" - the confinement of the strategic planning process within the limits of one or a few functional areas within the organisation. The strategy formulation process should thus consider explicitly all the relevant functions within the organisation.

### **3. DEVELOPING THE MODEL**

A new approach is proposed to the formulation of manufacturing strategy which has been developed. Because of the restrictions in space, only an outline of the main features of the proposed method is described below and it is also represented in a condensed form in Figure 1.

### **3.1. Triggered by relevant events**

In the proposed model, the replanning process can be triggered by relevant events *and* time as opposed to that triggered only by time as the main frameworks in the literature suggest. This can prevent the company from delaying in responding to relevant changes which occur between replanning points in time. The replanning process can also be triggered by any function which considers that something relevant has changed or may come to change relevantly in its field of interest.

### **3.2. Breaking barriers through customer-supplier negotiation**

In order to break down the organisational barriers, the approach used is based on negotiation between the functions on a "customer-supplier" basis. The basic assumption is that everybody in the organisation has customers (either internal functions or external customers) and should serve them in the best possible way, given the constraints imposed by the availability of resources and also bearing in mind the corporate objectives, policies and strategy. Customer and supplier functions should negotiate and agree on the levels of service or goods which the supplier is to provide. They have to agree on a specific set of performance criteria which represents the "point of contact" between the two functions. The "negotiation", it is suggested, can be based on "gap analysis" between the required (by the customer function) set of performance criteria and the set which is "offered" by the supplier function. The "point of contact" between marketing and manufacturing, for instance (the one emphasised in figure 1) may be the list of prioritised *order winning* and *qualifying* criteria (levels of delivery, product quality, costs and flexibility) which manufacturing should pursue (borrowing from Hill's (1985) framework). Between other pairs of functions, other "points of contact" are suggested, although the particular pairs of functions should negotiate and agree on their particular points of contact. Between manufacturing and finance, for instance, the relationship customer-supplier can be defined by the service which finance supplies manufacturing: availability of capital over a period of the time. Therefore, one aspect, which has to be agreed upon, is the capital cash flow to be made available to manufacturing.

### **3.3 The time-phased approach**

As can be seen, the points of contact or, in other words, the points which have to be agreed upon between customer and supplier companies, are not related to a single point in time, either present or future. Instead, they are "time-phased". This helps the functions agree not only upon objectives on a future point in time but also on the path through which the company will go about reaching some future competitive situation, stage by stage. The list of prioritised competitive criteria is no exception. The proposed framework considers the competitive criteria and also the other "points of contact" on a "time-phased" basis.

### **3.4. Proactivity achieved by using scenarios: the role of "contingency models"**

In the proposed framework, proactivity is achieved through the explicit consideration of future possible scenarios by all functions. In order to develop these scenarios, the function representatives and analysts have to be aware of current and prospective developments in their fields of interest. In the negotiation process, people from other functions will eventually demand alternatives from them in order that they are able to achieve a better performance in their own functions. Manufacturing people, for instance, will demand from finance people that they are able to offer alternatives for obtaining cheaper capital, in order to make investments. Marketing people will demand alternatives of possible future sets of competitive performance levels with regard to delivery, quality, costs and flexibility in

order that they can choose from a broader array of markets to be targeted in the present and in the future. This should motivate the representatives from the different functions to act proactively, in search of new alternatives in their specific fields. For the people within the particular functions to be able to devise scenarios, and also for them to be able to negotiate with other functions, they have to develop what we call "contingency models". Contingency models are defined here as formal conceptual models which link possible present and future contingencies (characteristics, actions and decisions) with the various "points of contacts" between the function and other interacting functions. In terms of the manufacturing-marketing interface, manufacturing people should develop contingency models which associated possible future decisions and actions (such as investments in equipment, hiring and training of people, adoption of control systems, among others) with the resulting alternative set of order winning and qualifying criteria. This would require that manufacturing people monitor and acknowledge new developments in production processes in order that they are able to assess the possibility of attending or not to the marketing "time-phased" requirements and also to produce alternative scenarios for them. Marketing people, on the other hand, should develop contingency models which should allow them to associate sets of order winning and qualifying criteria with different market segments, in order that they are able to reformulate marketing plans (target-market, frequency of new product introduction, among others) given that some change happened in the possible set of "time-phased" competitive criteria which the manufacturing function is able to provide either in the present or in the future.

#### **4. SUMMARY**

The proposed framework for manufacturing strategy development has the following main features:

1. The replanning process is triggered by events and time as opposed to only time.
2. It considers all the operational functions and any function can trigger the replanning process.
3. The interfunction relationship is based on negotiation, on a "supplier-customer" basis.
4. The negotiation between functions is based on "points of contact", which are the performance levels of the goods and services provided by the supplier function to the customer function.
5. The "points of contact" are "time-phased" so that not only future long term objectives are agreed upon, but also the rates of change can be agreed upon.
6. The main instrument used by the supplier functions in the process of negotiation are scenarios of alternative future performance with regard to the points of contact.
7. The scenarios are developed by using pre-developed contingency models which link alternative contingencies to the "points of contact".
8. The future scenarios are the formal means for the functions to exercise "proactivity". The dynamics of the framework are represented by Figure 1.

#### **5. SOME ISSUES ON IMPLEMENTATION**

The implementation of the proposed framework started in the company under study three months ago. A series of seminars on manufacturing strategy development are being run for representatives of all functions who are supposed to be the diffusers of the ideas. The next stage is the training of people within the functions on the instruments they will need in order to perform their functions according to the new method; in these seminars, contingency models, scenarios, points of contact, among other concepts will be discussed in order to uniformize the jargon among the functions. It is expected that the first negotiations regarding which would be the most appropriate points of contact between functions start to show in these seminars. The operationalization of the method, the forms, charts,

graphs, etc. which will support the negotiations and the process as a whole, have been developed by the people from the functions to ensure that they are involved in the process at early stages. The framework presented here is not supposed to be restrictive, but only a guideline to help the organisation design its own best method. The role of the implementation team is rather a facilitating one.

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