COMPETITIVE MANUFACTURING STRATEGIES FOR THE MANUFACTURING INDUSTRIES IN TURKEY

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ABSTRACT
In this study, results of the research into competitive manufacturing strategies of companies in four different sector studies covering 82 companies from the electronics, cement, automotive manufacturers, and appliances part and component suppliers in Turkey are presented. The data used in the study are gathered by conducting four sector surveys in 1997 and 1998 using a questionnaire supported by some follow-up interviews and site visits. A competitive manufacturing strategy is represented here by its components being the competitive priorities, the manufacturing objectives, and the action plans the companies plan to adopt in the near future. The results indicate that the manufacturing industry in Turkey bases its competition strategy mainly on low price, although there is a growing trend towards increasing emphasis on product differentiation. Quality and quality related issues constitute the top priority issues for the manufacturing industries in Turkey with Total Quality Management being the most preferred action plan.

Keywords: Manufacturing strategy, Total Quality Management, exploratory study.

INTRODUCTION

This study is based on data collected through the execution of the *Competitive Strategies and Best Practices Benchmarking Questionnaire* in 82 companies from four sectors of the manufacturing industries in Turkey. The results reported here are obtained through the analysis of the data coming from the competitive strategies module of the questionnaire.
These sector studies have been realized with the cooperation of the Turkish Industrialists' and Businessmen's Association (TÜSİAD), the Turkish Electronics Industrialists Association (TESİD), the Turkish Cement Producers' Association (TCMB), the Automotive Manufacturers' Association (OSD), the Appliances Part and Component Suppliers' Association (BEYSAD). The sector studies included 27 companies from the electronics sector, 25 companies from the cement sector, 10 companies from the automotive sector, and 20 companies from the appliances part and component (p&c) sector.
In the development phase of the *Competitive Strategies and Best Practices Benchmarking Questionnaire*, three steps are followed: Preparation, testing, and finalization. The

questionnaire consists of four modules. The competitive strategy module aims to explore possible near future developments in the competitive strategies of the companies by addressing their competitive priorities, manufacturing objectives and action plans. Manufacturing strategy module, practices module, and the performance and outcomes module all serve to the assessment of where the company stands in terms of business excellence and best practices. The results obtained from these last three modules have been summarised in Ulusoy and İkiz (2001) and Ulusoy (2003).

For each sector, an Industrial Advisory Board consisting of 6-9 members has been assigned in consultation with the respective Association. The main function of the Industrial Advisory Board has been to discuss at length with the project team the draft report prepared by the project team. The discussions led then to the final report.

Due to the large number of companies, the sample has been pre-selected and their contribution to the study has been secured beforehand so as to obtain a representative sample. Besides the parameters stated above, particular emphasis is given to the distribution of the sample companies according to the size of their customer base and their business nature, i.e., whether they are independent companies or a subsidiary or an operating unit of a parent or holding company.

Table 1- Company size of the sample by industrial sector

	Percentage of companies that are		
Industrial sector	Small-Sized	Medium-Sized	Large-Sized
Electronics	52 %	26 %	22 %
Cement	8 %	84 %	8 %
Automotive	0 %	30 %	70 %
Appliances p&c suppliers	30 %	55 %	15 %
Overall sample	23 %	48 %	29 %

Size distribution of the companies in the sample is given in Table 1. Here, companies with total number of employees less than 100, between 100 and 499, and 500 or more are considered to be small-sized, medium-sized, and large-sized companies, respectively.

The classification of the companies in the sample with respect to their annual total sales is provided in Table 2.

Table 2- Annual total sales of the sample by industrial sector

	Percentage of companies with annual total sales (million USD)			
Industrial sector	Less than 10	10 – 50	50 - 100	More than 100
Electronics	63 %	11 %	4 %	22 %
Cement	12 %	60 %	16 %	12 %
Automotive	0 %	0 %	20 %	80 %
Appliances p&c suppliers	75 %	15 %	0 %	10 %
Overall sample	42 %	26 %	9 %	23 %

COMPETITIVE MANUFACTURING STRATEGY

For a manufacturing company, the manufacturing function plays a fundamental role in its pursuit of competitiveness. It is therefore critical to formulate an appropriate manufacturing strategy that will enable the manufacturing function to contribute to the company's long-term competitiveness. The primary function of manufacturing strategy is to guide the business in putting together the set of manufacturing capabilities that will enable it to pursue its chosen competitive strategy over the long term (Hayes and Wheelwright, 1984). This requires the alignment of the manufacturing strategy with the company's business strategy. To attain the alignment, manufacturing strategy should not solely be based on developing capabilities in the areas such as cost, quality, timeliness, and flexibility, but it should also focus on goals such as increasing market share and profitability.

Manufacturing strategy formulation process requires making three strategic choices: selection and implementation of competitive priorities, manufacturing objectives and action plans (Kim and Arnold, 1996) as depicted in Figure 1. Competitive priorities indicate the relative importance of competitive capabilities. Once the competitive priorities are set, measurable performance targets should be established. These targets refer to manufacturing objectives, which are identified to support the envisaged competitive priorities. To achieve the established set of manufacturing objectives, in turn, the management should develop improvement programs; in other words, action plans, to be implemented in near future. An action program is described by Hax and Majluf (1984) as a structured, coherent, timed and evaluated continuum of actions, with a clearly defined schedule for completion in a relatively short time span, normally from 6 to 18 months. The ultimate outcome of this process is expected to be a positive contribution to the overall business performance.

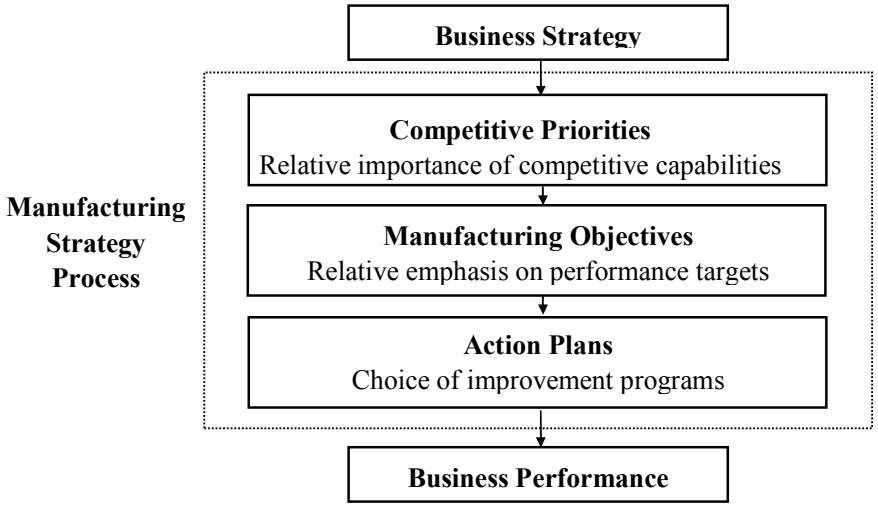

Figure 1-The process model for manufacturing strategy formulation (Kim and Arnold, 1996)

There are numerous exploratory studies reported in the literature on competitive strategies. Early studies have started with the project initiated by Boston University's Manufacturing

Roundtable in 1981 leading to the execution of Manufacturing Futures Survey in North America. In 1983, the studies have been extended to cover Japan and Europe; and later Mexico and some countries in the Pacific region. A large number of publications came out of these surveys. The findings from the surveys in the period 1983 to 1986 are presented in De Meyer *et al*. (1989). An extensive summary of the work accomplished till 1990 is given in Miller *et al*. (1992). Reports on the data from European Manufacturing Futures Survey in 1996 are provided in De Meyer (1998) and De Meyer and Pycke (1996a, 1996b). A four-country study from Europe is reported in Voss *et al*. (1995). Some national studies reporting on the manufacturing industries to be mentioned among others are the ones by Hörte *et al*. (1987) in Sweden, Voss and Hanson (1993) in Britain, Gelders *et al*. (1994) in Belgium, and Avella (1999) in Spain.

In the remainder of the paper, the results obtained regarding the competitive priorities, manufacturing objectives, and action plans are presented together with the conclusions reached.

COMPETITIVE PRIORITIES

Companies are asked about their competitive priorities, which will be valid for the company for the coming two years. Competitive priorities are defined as the distinguishing characteristics of a company in the market related to its products and services.

For each sector, the companies ranked the first five competitive priorities out of a list of 15 candidate competitive priorities. The complete list of competitive priorities is given in Ulusoy (2000). The list is comprised to include various aspects of the supply chain: product, production, and marketing. It is customer focused in the sense that many of the competitive priorities in the list are marketplace related with some reflecting performance in the marketplace. Only a few of the priorities represent internal measures.

Table 3- Ranking of competitive priorities for the next two years

Competitive Priorities	Score
Consistent quality level	3.16
Reliable products	2.15
Low price	1.78
Rapid design change /new product introduction	1.42
Dependable deliveries	0.84

The first five top competitive priorities with their associated average scores are given in Table 3, where a score of 5 represents the highest competitive priority rank. These competitive priorities are valid in general over all sectors. They are calculated as the average of the sector averages such that each sector has equal weight regardless of the number of companies participating in the sample. The same procedure is applied to obtain the aggregate short lists for both the manufacturing objectives and action plans.

This short list in Table 3 indeed reflects the rules of the game expected by the sample companies to become prevalent in the market in near future. You have to manufacture reliable products with not only good but consistent quality, to market them at relatively low prices, and to deliver them on time, and to meet further requirements of the customer. Here, *low price* does not imply cheap products but relatively lower prices compared to the

roughly equivalent competing products in the market. The fact that *rapid design change/new product introduction* has appeared as a competitive priority implies that companies to a large extent have come to understand importance of it as a competitive capability and the need to develop that capability. In this study, the term *new product* refers to products that are at most two years old and which display essential technical/technological differences from currently existing products in terms of their material, components, and function(s). They include also the class of products that are not unique but simply *new for the company*. For some companies, especially for a large number of supplier companies, introducing a new product implies introduction of a product new for the company, where its design is provided usually by the end product manufacturer.

MANUFACTURING OBJECTIVES

The companies have been asked to rank their top five manufacturing objectives they will pursue for the next two years from a list of 15 manufacturing objectives. The complete list of these manufacturing objectives is given in Ulusoy (2000). The manufacturing objectives cover all components of the supply chain. Profitability and market share are included in the list to reflect the role manufacturing should play in the formulation of the business strategy. Care is taken to restrict the choice of manufacturing objectives to those, whose associated attribute can be expressed in quantitative terms allowing the management for target setting.

Table 4- Ranking of manufacturing objectives

Manufacturing Objectives	Score
Decrease unit cost	3.59
Increase market share	2.34
Increase conformance quality	2.22
Increase profitability	1.16
Decrease new product development time	0.99

The top five manufacturing objectives singled out from the complete set by the companies is given in Table 4 together with their average score, where 5 corresponds to the highest priority rank. These manufacturing objectives support the competitive priorities in the short list given in Table 3.

Decreasing unit cost is by far the highest ranking manufacturing objective for the companies in the sample. It is indeed a major objective closely associated with almost all measures to be taken by the company. *Decreasing unit cost* allows the company to reduce its price and/or improve its product both leading to improved competitiveness for the company in the market place. Relatively lower prices are expected to increase the market share of the company.

Increasing market share is a primary target for many companies trying to establish themselves in the market place. The companies want to increase their sales by becoming more competitive. *Increasing market share* is expected to lead to further decreases in unit cost. This, in turn, will allow the companies to strengthen their competitiveness by not

only being able to reduce their prices but also by being able to allocate more resources for further investments towards increasing customer satisfaction and establishing themselves in the market.

Although *increasing conformance quality* is rated as the third ranking manufacturing objective it has a substantial reinforcing impact on the previous two manufacturing objectives.

Increasing profitability is ranked as the fourth manufacturing objective in the aggregate short list. In this study, *increasing profitability* implies the manufacturing of higher value-added products. In this sense, this manufacturing objective is directly related to product differentiation offering customers high value-added products. *Increasing profitability* is important for manufacturing in the sense that it creates the funds to invest adequately into manufacturing to increase its competitiveness.

Decreasing new product development time is directly related to the competitive priority *rapid design change/new product introduction*. It is interesting to note that it is emphasized by those sectors which have stated *rapid design change/new product introduction* as a competitive priority and which develop their own product design capability.

Although not included in the short list of manufacturing objectives in Table 4, *increasing production rate* closely follows as the sixth ranked manufacturing objective. *Increasing production rate* is mainly related to the manufacturing objectives of *decreasing unit cost* and *increasing market share*. Another dimension is associated with the improvement of capital and labour productivity. In order to increase the production rate, the existing manufacturing facilities have to be used more productively. Also, with this same purpose, the manufacturing facilities can be improved by new additions and/or modifications. Similarly, labour needs to be used more productively.

ACTION PLANS

The companies have ranked 10 action plans, which they plan to implement in the next two years, starting with the action plan having the highest expected impact on the successful execution of their manufacturing strategy. They have selected these 10 action plans out of a list of 35 action plans. The list is comprised to include action plans in support of the manufacturing objectives mentioned above. The list is kept rather broad in order to end up with a list general enough to be applicable to all sectors of industry (Ulusoy, 2000). To facilitate the discussion over the choices of the companies, action plans are grouped under three subheadings of quality, production, and human resources. The groups are reported in Table 5, where the number in parentheses following each action plan corresponds to its rank among the most preferred 10 action plans. It is interesting to observe that the action plans in the top ten list show a balanced distribution among these areas. In general, they are linked with the competitive priorities and the manufacturing objectives stated in Tables 3 and 4, respectively.

Quality

Total Quality Management (TQM) turns out to be by far the number one action plan preferred by the companies. This choice is consistent with the previous choice of *consistent quality* as the top competitive priority. *TQM* is defined as an action plan to produce and deliver products or services, which are confirming with customers' needs or requirements by better, cheaper, faster, safer, easier processing than competitors with the

participation of all employees under the top management leadership. Thus, *TQM* can be considered as the underlying action plan contributing extensively to all the manufacturing objectives in the aggregate short list in Table 4.

Table 5- Grouping of the action plans

Action Plans		
Quality	*Production*	*Human Resources*
TQM (1)	Just-in-time production (4)	Restructuring (2)
Zero defect (6)	Production automation (5)	Employee empowerment (3)
Quality improvement teams	Energy saving (8)	Training of managers (10)
	Developing new processes for new products (9)	

To become a world-class company, it is essential to involve employees in the pursuit of improvement goals. Employee involvement in quality improvement activities can be realized through such instruments as *quality improvement teams. Quality improvement teams* constitute an important indicator for how well *TQM* is diffused throughout a company. Quality advocates have long stressed employee involvement as an important key to turning quality strategies into demonstrable quality performance. For example, Rommel *et al.* (1994) report that in Japan 78% of the production workers participated in *kaizen* activities, whereas this figure was 43% for higher quality European companies and 8% for lower quality European companies. Half of the companies in the sample reported percentage of production operators involved in process improvement or problem solving teams as less than 5%, which is very low. Thus, employee involvement in quality improvement activities is still a current issue for the surveyed companies. That this action program is part of the short list is an indication that some of the companies are aware of this issue and want to alleviate the negative impact on quality of the low level of employee participation in current quality activities.

Production

Just-in-time production is emphasized both by automotive and consumer electronics sectors as part of the cost reduction schemes, whereas for the cement sector it is a necessity due to the perishable nature of cement. *Just-in-time production* applied properly has a considerable impact on cost reduction by reducing the inventories at all stages of production. It can only be developed on a solid quality basis and thus is closely related to *TQM* efforts.

Production automation supports in a direct way the manufacturing objectives of increasing production rate and increasing direct labour productivity. It is also in line with the aspirations of the companies to increase their market share. Automation might require a significant amount of investment. In order to attain higher levels of capital productivity, automation needs to be built on a sound infrastructure so that sufficient benefits will be realized to balance the cost of automation. Such an infrastructure is best provided by the emphasis on *TQM*, training, employee empowerment, and quality improvement teams already observed among the more popular action plans in this study.

It appears that *energy saving* is an action plan strongly emphasised by the cement sector due to the high share of energy cost within its manufacturing cost.
The action plan of *aligning customer needs and product development* is associated with companies having some form of product design activity. *Aligning customer needs and product development* has a positive impact on the effectiveness and efficiency of new product design process and improves the chance for success of the new product in the market.
Manufacturing processes play a major role in securing high quality and low cost products. The search for the best feasible option of full-scale production of a new product might lead to the development of new manufacturing processes. Thus, *developing new processes for new products* becomes the action plan to answer this need. This action plan is part of the efforts to achieve a smooth and efficient product initiation process preceding full-scale production.

Human resources
The fact that *restructuring* is strongly represented in the short list indicates the need for organizational innovation. There can be many different environments leading to the adoption of *restructuring* as a remedy. Part of the emphasis on *restructuring* aims at decreasing the number of layers in the organization. Part of it, on the other hand, is meant to overcome the negative implications of fast growth on some of the companies. A major problem appears to be the dilemma faced by family-owned companies. Such companies grow fast but they lack professional management and an organizational framework to respond to that challenge. These companies look up to restructuring as a remedy for such deficiencies.
Employee empowerment moves the responsibility down the layers of the organization. It helps to increase commitment and creativity among the employees. This item can be considered as being closely linked to *TQM*. *Employee empowerment* hints to the fundamental change in the attitude of management to the employees and in the practice of human resources management. Obviously, *employee empowerment* is also related to *restructuring*.
A major hurdle in front of the successful execution of *TQM* is stated to be lack of top management support. *Training of managers* can help to secure their support for the *TQM* journey. Thus this choice of the sample companies is complementary to their top action plan choice *TQM*. Furthermore, the sample companies consider *leadership* as the practice with the highest impact on their success and *training of managers* can help to secure increased contribution to their success from the leaders in the company.
Considering the emphasis on *TQM*, it might appear to be contradictory that *training of employees* is not part of the aggregate short list and has received a rather low ranking among the prospective action plans. The companies consider the training of employees directly related to *TQM* to be part of this action plan.

CONCLUSIONS

Combining the preferences obtained from the sample companies regarding their competitive priorities and manufacturing objectives and action plans as reported above, one reaches the following conclusions.

At this stage of its development, in general, the manufacturing industry in Turkey bases its competition strategy mainly on low price rather than product differentiation in the sense of Porter (1980). But it should also be stressed that the competitive priority *rapid design change/new product introduction* has entered the short list of all sectors/sub-sectors except the cement sector. Furthermore, a related manufacturing objective, *decreasing new product development time* is selected by companies to become part of the short list. These observations indicate that, in general, companies express an inclination to increase the weight of the product differentiation strategy within their mixed strategy in near future.

The ranking of the manufacturing objectives implies that the agenda of the manufacturing industries in Turkey is to be able to manufacture quality products at low costs and to increase their market share. The companies also want to increase their profitability through introducing relatively higher value-added products into the market. This is also in line with the increasing emphasis on product differentiation and on improving their new product development capability.

The companies have specified quality as the outcome having the biggest impact on their success. Quality is stated to be the most important supplier selection criterion for the manufacturers. The manufacturing companies in Turkey are aware of the fact that quality is a fundamental requirement for sustaining their existence in the market as well as a qualifier to enter the market place. The survey results, on the other hand, indicate to areas of considerable improvement in the quality domain. The companies seem to be aware of this situation. When shaping their strategies, policies, and plans for the near future, they have specified *consistent quality level* as the top competitive priority, *increasing conformance quality* as the third manufacturing objective, and *TQM* by far the most popular action plan with several other quality tools included in the list of action plans to be adopted. This requires the creation of an environment by the management conducive to the mutual support of quality and productivity. The strong leadership observed to be exercised by the management is expected to contribute also to the success of the TQM approach in the companies.

In contrast to the conclusion reached by De Meyer (1998) that European quality movement has reached a point of decreasing marginal returns for the European companies in the 1990s, the quality movement in Turkey is still on the rise providing substantial benefits to its practitioners (Ulusoy and İkiz, 2001).

Both supplier relations and innovativeness are considered to have the least impact on the recent success of the sample companies. These two issues promise major benefits for the manufacturing industries in Turkey. Both issues are discussed in great detail in Ulusoy (2003).

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