COMPETITIVENESS OF MANUFACTURING INDUSTRIES IN UNION TERRITORY OF PUDUCHERRY (INDIA): A CRITICAL ANALYSIS

T. Nambirajan
Reader
Department of Management Studies,
School of Management, Pondicherry University,
Puducherry-605014, India
E-Mail ID: nambi.dms@pondiuni.edu.in
Mobile No: +91-94433-84550

M. Prabhu
Ph. D Scholar
Department of Management Studies,
School of Management, Pondicherry University,
Puducherry-605014, India
E-Mail ID: bordauprabhu@gmail.com
Mobile No: +91-98947-60901

ABSTRACT

In the present research work, authors aim to evaluate competitive priorities among the manufacturing industries in Union Territory of Puducherry, India. Data were randomly drawn from a sample of 52 executives of manufacturing industries in Union Territory of Puducherry. For the purpose of analysis, authors have considered eight competitive domains consisting of 43 factors. Cronbach's Alpha is a commonly used procedure to assess the internal consistency reliability of several items or scores that are going to be used to create a summated scale score. To measure scaling performance of competitive priorities in manufacturing industries, we have selected following domains such as Quality, Cost, Delivery, Flexibility, Customer focus, Know- how, Innovation and Image. Our statistical analysis reveals that quality, delivery, cost and customer-focus are the most influencing domains on the competitive priority of manufacturing industries located in Union Territory of Puducherry.

INTRODUCTION

Trade liberalization and globalization processes have significantly increased customer expectations and competition among companies. Competitiveness is a complex subject that has been analysed by many scholars using different conceptual approaches. Some authors view competitiveness of the firm in terms of productivity. McKee and Sessions-Robinson (1989) pointed out that the company, industry, or nation with the highest productivity could be seen as the most competitive. Competitive companies must produce and deliver products and services that meet customer needs and wants. In order to provide their customers with greater satisfaction than their competitors, companies must reduce production cycles and costs, improve the quality of products and services, improve relationships with suppliers and customers and re-examine their organizational systems in order to respond any change in customer preferences as fast as possible (Johnson, 1992; Hammer and Champy, 1993).

Implementation of quality initiatives can bring about major improvements in productivity and competitiveness in various organizations. Manufacturing performance is often measured by cost, quality, dependability and flexibility. Improved competitiveness means that the firm has improved on one or more of these dimensions relative to it's competitors (Lee, 2003). Competitiveness of manufacturing industries is mostly dependent on its ability to perform well in dimensions such as cost, quality, delivery, dependability and speed, innovation and flexibility to adapt itself to variations in demand (Carpinetti, L.C.R., Gerolamo, M.C. and Dorta, M., 2000). While alignment of the manufacturing function with strategic priorities is core to competitiveness, the continuous improvement of the manufacturing function plays a very important role in the quest of competitiveness in the long run. Four widely accepted competitive priorities are cost, delivery, quality and flexibility. Competitive priorities might be used as measures of competitiveness. Organizations should optimize the quality/price ratio for operational excellence (Fleury and Fleury, 2003). Lau (2002) has observed that quality and lower cost are the top ranking competitive factors among US electronics and computer industries.

Competitive priority is widely used in the studies of manufacture strategy, in which the first-and second-ranked objectives are quality and delivery performance respectively (Schroeder, R.G., Anderso, J.C. and Cleveland, G, 1986). Low cost, flexibility, quality and delivery or dependability are the four main components of competitive priority (Hayes and Wheelwright, 1984; Wheelwright, 1984; Ward, P., Duray, G.K., Leong, G.K. and Sum, C, 1995). A fifth competitive priority - innovativeness - has been suggested by (Leong, G. K., Snyder, D. L. and P. T. Ward, 1990) and is gradually gaining recognition. Phusavat and Kanchana (2007), identify six criteria to act as competitive priorities: (1) quality, (2) cost, (3) delivery, (4) flexibility, (5) customer-focus and (6) know-how. Some researchers modified the multi-dimensional structure of competitive priority by integrating new items such as innovation and human resources to emphasize each competitive goal (Wood, C.H., Ritzman, L.P. and Sharma, D, 1990).

OBJECTIVES

Till date no researcher has done a scientific study about finding out the competitiveness of manufacturing industries in Union Territory of Puducherry (India). Hence there is a need to do such study relating to manufacturing industries located in Union Territory of Puducherry. The primary objective in this study is to identify competitive priorities among factors that will determine the competitiveness of manufacturing industries located in Union Territory of Puducherry, India.

COMPETITIVE VARIABLES

To find out competitive priorities among factors that will determine the competitiveness of manufacturing industries in Union Territory of Puducherry, authors have selected following domains such as quality, cost, delivery, flexibility, customer focus, know-how, innovation and image. These domains are further broken down into 43 factors. These details are given below:

1. Quality: Factors considered under the domain quality are given below: (1) low-defect rate, (2) performance quality, (3) product durability, (4) environmental aspect, (5) certification and (6) product reliability.

2. Cost: Factors considered under the domain cost are given below: (1) low costs, (2) value added costs, (3) continuous improvement, (4) activity based measurement and (5) quality costs.

3. Delivery: Factors considered under the domain delivery are given below: (1) fast delivery, (2) on time delivery, (3) right quality, (4) dependable promises and (5) right amount.

4. Flexibility: Factors considered under the domain flexibility are given below: (1) design adjustments, (2) broad product line, (3) Ability to rapidly change product mix and (4) Ability to rapidly change production volumes.

5. Customer-focus: Factors considered under the domain customer-focus are given below: (1) after sales service, (2) product support, (3) dependable promises, (4) measurement of satisfaction, (5) product customization and (6) customer information.

6. Know-how: Factors considered under the domain know-how are given below: (1) creativity, (2) knowledge management, (3) continues learning, (4) problem solving skills, (5) training/education and (6) research and development.

7. Innovation: Factors considered under the domain innovation are given below: (1) developing/refining existing processes, (2) beating the competition to market with new products or services, (3) new product development, (4) innovation in products or services and (5) innovation in manufacturing processes.

8. Image: Factors considered under the domain image are given below: (1) ability to forecasting market growth, (2) brand identification, (3) innovation in marketing techniques and methods, (4) control of distribution channels, (5) extensive use of advertising and (6) brand range of products.

DATA AND METHODOLOGY

Data were collected using a questionnaire. A well structured questionnaire was developed and it consists of eight competitive domains. The questionnaire consists of 43 factors. Questionnaires were organized into two sections: (1) Industry profile and (2) Competitive priorities such as quality, cost, delivery, flexibility, customer-focus, know-how, innovation and image. Five point Likert scale (1-Very low priority, 2-Low priority, 3-Average priority, 4-Highe priority and 5- Very high priority) was used to collect data. Data were collected from participating firms by conducting face-to-face interviews with chief executives, managing directors, general managers and senior level managers dealing with a functional area of the organization such as marketing, operations, finance and human resources. Sample data were randomly collected from 52 manufacturing companies located in Union Territory of Puducherry. For the purpose of analysis, authors applied Cronbach alpha to find the internal consistency reliability of several items in the data. The analysis primarily used descriptive statistics like mean.

RESULTS

Competitive priority of industries has been evaluated on the scale of 1 to 5 as explained in the previous section. Data were collected from firms in eight key sectors of industries: (1) Automobiles, (2) Auto components, (3) Casting & Forging, (4) Electrical & Electronics,
(5) Food and Agro-Business, (6) Machine Tools, (7) Pharmaceutical and (8) Textiles. Table 1 provides the following details with respect to the distribution of firms: (1) number of employees (PANEL-A), (2) number of years in business (PANEL-B), (3) targeted customers (PANEL-C) and (4) international market proportion (PANEL-D).

Table 1 Distribution of sample firms with respect to number of employees (PANEL-A)

Number of employees	Frequency	Percent	Cumulative percent
0-10	1	1.92	1.92
11-50	9	17.30	19.23
51-100	12	23.07	42.30
101-300	10	19.23	61.53
301-1000	14	26.92	88.46

1000 and above	6	11.53	100
Total	52	100	

Table 2 Distribution of sample firms with respect to number of years in business (PANEL-B)

Number of years in business	Frequency	Percent	Cumulative percent
<5	5	9.61	9.61
5-10	9	17.30	26.92
11-15	10	19.23	46.15
16-20	6	11.53	57.69
21-25	10	19.23	76.92
25 and above	12	23.07	100
Total	52	100	

Table 3 Distribution of sample firms with respect to targeted customers (PANEL-C)

Targeted customers	Frequency	Percent	Cumulative percent
Domestic market	7	13.46	13.46
Domestic and International market	45	86.53	100
Total	52	100	

Table 4 Distribution of sample firms with respect to international market proportion (PANEL-D)

International market proportion (percent)	Frequency	Percent	Cumulative percent
<20	19	42.22	42.22
20-40	13	28.89	71.11
41-60	8	17.78	88.89
61-80	2	4.44	93.33
81-100	3	6.67	100
Total	45	100	

Table 5 shows the relative importance given to eight domains in manufacturing industries located in Union Territory of Puducherry.

Table 5 Relative importance given to Puducherry (N=52)

Domains	Mean	Rank
Quality (Q)	4.212	1
Delivery (D)	4.204	2
Cost (C)	4.000	3
Customer-focus(CF)	3.913	4
Know-how (K)	3.782	5
Flexibility (F)	3.668	6
Innovation (IN)	3.562	7
Image (I)	3.526	8

Quality remains as the number one competitive priority of manufacturing industries in Puducherry. Second competitive priority is delivery and the third one is cost. Among eight domains, innovation and image gets least priority. Ranking of competitive factors is shown in Table 6.

Table 6 Ranking of competitive factors

Sl. no	Factors	Mean	Rank
1	Performance quality-Q	4.46	1
2	Product reliability-Q	4.46	2
3	Right quality-D	4.42	3
4	On time delivery-D	4.34	4
5	Continuous improvement-C	4.25	5
6	Fast delivery-D	4.25	6
7	Product durability-Q	4.19	7
8	Quality costs-C	4.17	8

9	Problem solving skills-K	4.09	9
10	Environmental aspect-Q	4.07	10
11	Certification-Q	4.07	11
12	Measurement of satisfaction-CF	4.07	12
13	Low-defect rate-Q	4	13
14	Right amount-D	4	14
15	Dependable promises-D	4	15
16	Customer information-CF	3.98	16
17	Dependable promises-CF	3.94	17
18	Product support-CF	3.90	18
19	Value added costs-C	3.88	19
20	Activity based measurement-C	3.88	20
21	Ability to rapidly change production volumes-F	3.86	21
22	Low costs-C	3.80	22
23	Product customization-CF	3.80	23
24	Knowledge management-K	3.80	24
25	Continuous learning-K	3.80	25
26	After sales service-CF	3.76	26
27	Creativity-K	3.76	27
28	Brand identification-I	3.76	28
29	Training/education-K	3.73	29
30	Broad range of products-I	3.71	30
31	Innovation in products-IN	3.65	31
32	Broad product line-F	3.63	32
33	Design adjustments-F	3.59	33
34	Developing /refining existing processes-IN	3.59	34
35	Ability to rapidly change product mix-F	3.573	35
36	Beating the competition to market with new products-IN	3.57	36
37	Innovation in marketing techniques and methods-I	3.57	37
38	New product development-IN	3.55	38
39	Forecasting market growth-I	3.51	39
40	Control of distribution channels-I	3.5	40
41	Research and Development-K	3.48	41
42	Innovation in manufacturing processes-IN	3.46	42
43	Extensive use of advertising-I	3.03	43

Table 6 shows quality is ranked as first with the mean score of 4.212. This reveals that in manufacturing industries located in Union Territory of Puducherry quality is given number one priority. Performance quality and product reliability are the most important priorities among the executives.

To find out the internal consistency reliability of data set we used Cronbach alpha coefficient. Table 7 shows score of Cronbach alpha coefficient corresponding to different domains.

Table 7 Results from Cronbachs alpha value corresponding to domains

Domains	Cronbachs alpha values
Quality	0.786
Cost	0.722
Delivery	0.844
Flexibility	0.651
Customer-focus	0.835
Know-how	0.793
Innovation	0.826
Image	0.853

To ensure the reliability of questionnaires this analysis was performed. The recommended minimum acceptable limit of reliability "alpha" for this measure is 0.60 (Hair, J., Anderson, R., Tatham, R. and Black, W, 1998). Table 7 shows that the Cronbach's alpha coefficient of the competitive priorities variables: quality, costs, delivery, flexibility, customer- focus, know-how, innovation and image. These ranges from 0.651 to 0.853 Table 7 shows that all constructs have passed the reliability test where all alpha – values have exceeded the recommended minimum value of Cronbach's alpha. This indicates that the variables of various domains have good internal consistency.

INTERPRETATION

The overall survey result reveals quality domain is the most competitive priority among the manufacturing industries in Union Territory of Puducherry. From Table 5, one can infer that quality, delivery, cost and customer-focus are key domains which contribute to the competitiveness of manufacturing industries in Union Territory of Puducherry. In addition to these four domains, know-how, flexibility, innovation and image also contribute to the competitiveness of manufacturing industries in Union Territory of Puducherry.

From Table 6, the following interpretation can be made.

a) The factor performance quality which falls under the domain of quality ranked first in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

b) The factor product reliability which falls under the domain of quality ranked second in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

c) The factor right quality which falls under the domain of delivery ranked third in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

d) The factor on time delivery which falls under the domain of delivery ranked fourth in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

e) The factor continuous improvement which falls under the domain of cost ranked fifth in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

f) The factor fast delivery which falls under the domain of delivery ranked sixth in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

g) The factor product durability which falls under the domain of quality ranked seventh in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

h) The factor quality costs which falls under the domain of quality ranked eight in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

i) The factor problem solving skills which falls under the domain of know-how ranked ninth in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

j) The factor environmental aspect which falls under the domain of quality ranked tenth in improving the competitiveness of manufacturing industries in Union Territory of Puducherry.

Similarly the influence of other 33 factors in improving the competitiveness of manufacturing industries in Union territory of Puducherry can be interpreted from Table 6.

CONCLUSIONS

The present research work resulted in finding out the key factors that will determine the competitiveness of manufacturing industries in Union Territory of Puducherry, under eight different domains namely quality, cost, delivery, flexibility, customer-focus, know-how, innovation and image. Authors have taken into consideration 43 factors for this study. Cronbach's α (alpha) is used as a statistic. It is commonly used as a measure of the internal consistency or reliability for a sample of examinees. Cronbach's alpha result indicates that the variables of various domains have good internal consistency. Our statistical analysis reveals that quality, delivery, cost and customer-focus are the most influencing domains on the competitive priority of manufacturing industries located in Union Territory of Puducherry.

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