

(goals) and means (policies), whereas according to Steiner (1979) strategy refers to basic directional decisions i.e. purposes and missions. Strategy is perspective, i.e. vision and direction. Porter (1986) defined competitive strategy as a combination of goals for which the firm is striving and the policies by which it is seeking to get there. Manufacturing strategy falls within the widely accepted hierarchy of strategy (Fine and Hax, 1985; Hill, 1989). This hierarchy spans four levels i.e. industry level strategy, corporate level strategy, business level strategy, and functional level strategy. Industry level strategy concerns to an industrial sector such as automobile, tractor etc. Corporate level strategy formulation is mainly characterized by the consideration of scope and resource deployments. At the business level, it decides the scope and boundaries of each business unit and the operational links with the corporate strategy. At operational/functional level e.g. manufacturing strategy, marketing strategy, and research and development (R & D) strategy, the objectives is to support the desired business level strategy in a manner that will provide a

competitive advantage (Gupta and Lonial, 1998).

2. MANUFACTURING COMPETITIVE PRIORITIES

Manufacturing competitive priorities may be defined as a consistent set of goals for manufacturing. The review of various works enables us to identify the existence of four key manufacturing competitive priorities i.e. quality, cost, delivery, and flexibility. These competitive priorities are compiled, among others, in the works of Hayes and Wheelwright, 1979 and 1984; Buffa, 1984; Wheelwright, 1984; Fine and Hax, 1985; Swamidass and Newell, 1987; Ward et al., 1998; Kathuria et al., 1999. The manufacturing competitive priorities have been referred to as the dimensions of manufacturing strategy or the content of manufacturing strategy. Manufacturing competitive priorities capture how capabilities-based competition will evolve (Roth, 1996). Manufacturing competitive priorities represent a holistic set of tasks, which should be performed by the manufacturing function in order to support the business strategy (Kim and Arnold, 1996).

Skinner (1969) believed that a company in reality may not be able to perform well in all dimensions simultaneously and proposed a trade-off model. Later, Ferdows and De Meyer (1990) challenged trade-off model and presented a new cumulative model named as Sand Cone Model. They argued that many companies in Japan and USA are simultaneously achieving more than one competitive priority. Sand cone model was supported by many researchers (e.g. Skinner, 1985; Noble, 1995; Hill, 1989). They proposed the concept of order winners and order qualifiers. Skinner (1985) and Hill (1989) named two dimensions of delivery i.e. dependable delivery, and delivery speed. The following dimensions of delivery seem to be relevant:

- i) Delivery speed: respond quickly to customer orders
- ii) Dependable delivery: make on time delivery or meet delivery schedules

Garvin (1987) has identified eight strategic dimensions of quality: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality. On the other hand, Hill (1989) called these strategic dimensions

as an order qualifier. Corbett and Wassenhove (1993) argued that competitive priorities (cost, quality, delivery, flexibility and innovation) might be used as measures of competitiveness (external) and competence (internal). They described these two as different sides of the same coin. Quality refers to all physical aspects of the process and product or service delivered. Khir Harun & Kai Cheng (2010) suggest new quality elements of an aerospace to integrate in existing criteria for manufacturing competitiveness. Low cost is considered as a well-established competitive priority in manufacturing strategy.

Browne et al. (1984) defined eight dimensions of flexibility, which are machine flexibility, process flexibility, product flexibility, routing flexibility, volume flexibility, expansion flexibility, operation flexibility, and production flexibility. Atkinson (1984), using the flexible firm model, debated the implications for manpower, work and employment. He identifies three dimensions of flexibility which are functional flexibility, numerical flexibility and financial flexibility. Upton (1995)

acknowledged the important role of flexibility in today's competitive environment. Vokurka and O'Leary-Kelly (2000) have defined five dimensions of flexibility. The following dimensions as proposed by Upton (1994) seem to be relevant in Indian manufacturing environment.

- i) Product customization: customize products to customer needs
- ii) Product mix changes: make rapid product mix changes
- iii) Design changes: make rapid design changes.
- iv) Volume changes: make rapid volume changes
- v) New product introduction: Introduce new products quickly

Narwal et al (2006, 2008, and 2009) studied various industries situated northern India and concluded that the competitive priority in Indian scenario varies sector to sector to manage the competition.

From all these studies it is observed that manufacturing is considered merely as a

support activity for marketing and finance in most of the organization. Thus, till very recently, manufacturing have got little top management attention. Many firms are not even practicing well tested efficiency methodologies of Scientific School of Management that provides the foundation for further development as it happens in western industrialized countries. The competition is in terms of reduced cost, improved quality, product with higher performance, flexibility better service, innovation and all delivered simultaneously. So, to compete effectively and to survive in turbulent competitive environment the firms are in real need to make effective manufacturing strategy by adopting new manufacturing management philosophies from holistic view point.

3. RESEARCH METHODOLOGY

The research methodology is based on empirical data collected through a questionnaire survey. The main objective of this survey is to examine the status of manufacturing strategy issues in Indian manufacturing companies. The questionnaire was administered in 110

manufacturing companies from three major sectors i.e. automobile, tractor and general manufacturing industries in the northern India. A database of 110 companies had been created and a structured questionnaire was administered. These companies were pooled in from the database of industrial directories and located mostly in northern India. Selection criterion was based on two parameters i.e. number of employees (more than 100) and annual sales (more than Rs.1.25 crore). After reminders,

phone calls, e-mails and re-reminders, 44 filled responses have been received, which gives response rate of 40%. Out of the 44 respondents, 25 (57%) were from the top management level i.e. CEO/General Manager/President having 20 to 30 years experience. The hierarchical level of the respondents in their respective organization has shown in Figure 1.1. Vital statistics of respondents is given in Table 1.1. The process through which the collected data has been analyzed discussed in the next section.

Industry sector	Questionnaire sent	Responses received (%)
Automobile	40	17(43)
Tractor	25	10(40)
General	45	17(38)
Total	110	44(40)

Table 1.1 Vital statistics of survey

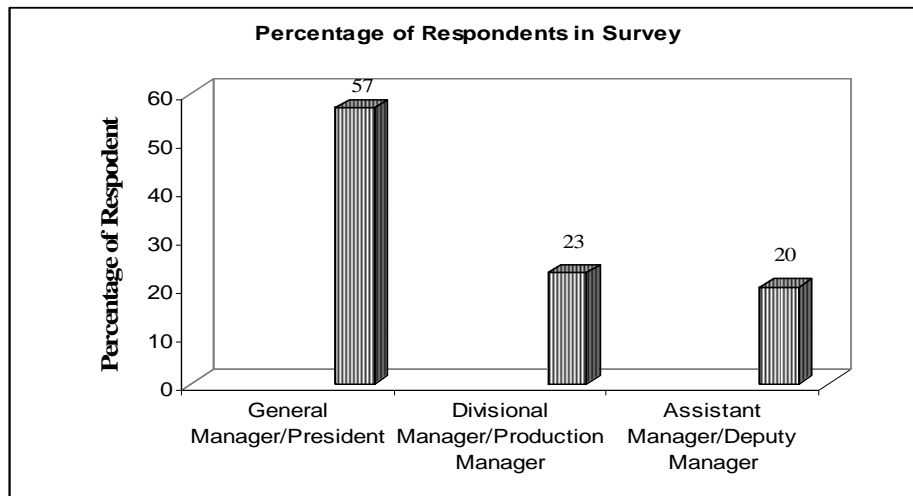


Figure 1.1 Percentage of various respondents during the survey

4. ANALYSIS AND OBSERVATIONS

The overall and the sector wise values of mean and standard deviation of competitive priorities such as quality, cost, delivery, and flexibility have been considered for the analysis. The quality is having the four dimensions. But, cost and delivery are having one and two dimensions respectively, whereas the flexibility is having five dimensions. For each competitive priority, respondents were asked to indicate the degree of importance on a five point Likert scale (1-least important, 5 -most important). The basic four competitive priorities identified by various researchers were expanded into twelve dimensions i.e. conformance

quality, product durability, product reliability, product performance, low cost, delivery speed, dependable delivery, product customization, product mix changes, design changes, volume changes, and new products. Table 1.2 shows the overall and sector wise value of mean and standard deviation of the four competitive priorities including the individual values of twelve dimensions.

The top most competitive priority for automobile (especially two-wheeler industry), tractor, and general manufacturing sector can now be determined from Table 1.2. Most competitive priority for tractor is quality. However, for automobile sector and

general manufacturing sector it is low cost. Flexibility is the least preferred competitive priority for tractor, and general manufacturing sectors. One interesting observation can be made from table 1.2 is that highest mean score (4.71) of tractor sector is for product durability, product reliability and product performance, whereas the highest mean score (4.50) of automobile sector is for conformance quality. However, in general manufacturing sector, the highest mean value {4.66} go to delivery speed. But, in overall sector statistics highest mean score (4.32) goes to low cost. It has been observed from the above results that in overall manufacturing companies emphasize on various competitive priorities depending upon sector specific strategies and market needs.

Figure 2.1 shows mean score of the overall and sector specific (automobile especially

two-wheeler industry, N=17, tractor N=10, and general manufacturing industry, N=17) competitive priorities. Sector wise mean score of 12 items of competitive priorities are represented in figure 22 (a) to (d). Table 1.3 shows the correlation between 12-items of competitive priorities. All competitive priorities except product customization (F1), product mix changes (F2) and new product (F5), are significantly correlated with other competitive priorities. The competitive priorities, which are not significantly correlated, are under the category of flexibility. The correlations imply that the manufacturing companies in the survey are strongly emphasizing on these competitive priorities. The Cronbach's alpha for the 12-item scale is 0.83, which indicates a high level of internal consistency among competitive priorities items (Nunally, 1978).

Competitive Priorities	Auto		Tractor		General		Overall	
	Mean(R)	SD	Mean(R)	SD	Mean (R)	SD	Mean	SD
Quality(Q)								
Product durability (PD)	4.08(5)	1.08	4.71(1)	0.48	3.41 (8)	1.08	4.06	0.88
Product reliability (PR)	4.16(4)	1.11	4.71(2)	0.48	3.50 (6)	1.08	4.12	0.89
Conformance quality (CQ)	4.50(1)	0.79	4.57(4)	0.53	4.50 (2)	0.67	4.52	0.66
Product performance (PP)	4.33(3)	1.30	4.71(3)	0.48	4.08 (4)	1.16	4.37	0.98
Sector statistics	4.26	1.07	4.68	0.49	3.87	0.99	4.27	0.85
Low cost (LC)	4.41(2)	1.48	4.14(8)	0.89	4.41(3)	0.51	4.32	0.96
Sector statistics	4.41	1.48	4.14	0.89	4.41	0.51	4.32	0.96
Delivery (D)								
Delivery Speed(DS)	3.75(8)	1.48	4.42(5)	0.53	4.66 (1)	0.49	4.27	0.83
Dependable delivery (DD)	3.58(10)	1.50	4.28(6)	0.50	3.08(10)	1.16	3.64	1.05
Sector statistics	3.66	1.49	4.35	0.51	3.87	0.82	3.96	0.94
Flexibility (F)								
Product customization(PC)	3.91(7)	1.50	4.28(7)	0.75	3.33 (9)	1.15	3.84	1.13
Product mix change (PM)	4.08(6)	0.90	3.29(11)	1.38	3.58 (5)	0.99	3.65	1.09
Design change (DC)	3.41(12)	1.08	3.00(12)	1.29	2.66(12)	1.07	3.02	1.14
Volume change (VC)	3.50(11)	1.24	3.57(9)	0.97	3.50 (7)	0.52	3.52	0.91
New Product (NP)	3.66(9)	1.37	3.57(10)	1.13	2.91(11)	1.24	3.38	1.24
Sector statistics	3.71	1.21	3.54	1.10	3.19	0.99	3.48	1.10

Table 1.2 Sector wise competitive priorities

Auto-Two Wheeler industry, Tractor-Tractor industry, General – General manufacturing industry, SD-Standard deviation, R-Rank (on five point Likert scale: 1-least important, 5-most important), Value in bold represent the highest mean score

	Competitive priorities	Q1 (PD)	Q2 (PR)	Q3 (CQ)	Q4 (PP)	C1 (LC)	D1 (DS)	D2 (DD)	F1 (PC)	F2 (PM)	F3 (DC)	F4 (VC)	F5 (NP)
1	Q1 (PD)	1.000	.973**	.024	.734**	.350	.298	.541**	.240	.107	.461**	.317	.322
2	Q2 (PR)		1.000	.068	.772**	.393**	.196	.491**	.227	.095	.460**	.383*	.305
3	Q3 (CQ)			1.000	.171	-.144	.272	.047	.298	.260	.021	.093	-.065
4	Q4 (PP)				1.000	.377**	.323	.386*	.341	.138	.361*	.450*	.152
5	C1 (LC)					1.000	.280	.226	.188	.245	.372*	.445*	.202
6	D1 (DS)						1.000	.283	.319	.068	.048	.165	.053
7	D2 (DD)							1.000	.203	.071	.078	.230	.020
8	F1 (PC)								1.000	.470*	.424*	.590**	.238
9	F2 (PM)									1.000	.664**	.559**	.321
10	F3 (DC)										1.000	.520**	.335
11	F4 (VC)											1.000	.234
12	F5 (NP)												1.000

Table 1.3 Correlations among competitive priorities (N=44)

Pearson’s correlation coefficient calculated with SPSS for windows (version 7.5)

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

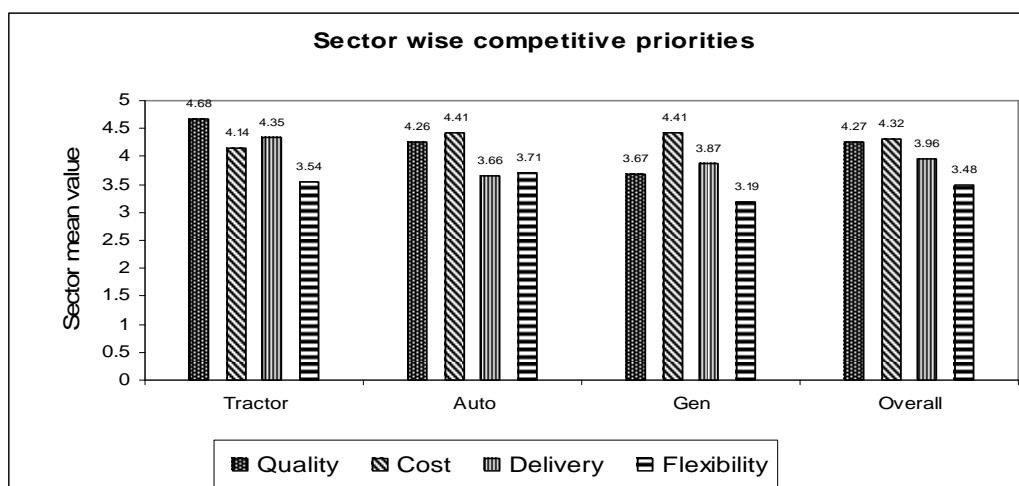


Figure 2.1 Mean score value of the overall and sector specific competitive priorities

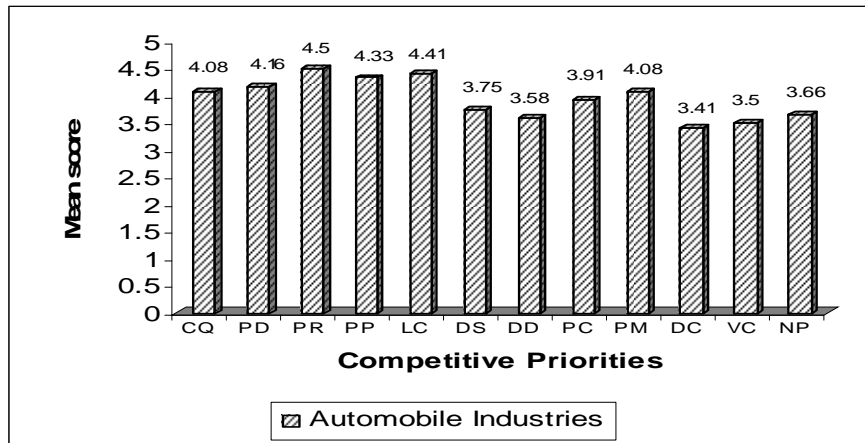


Figure 2.2 (a) Competitive priorities of Automobile sector

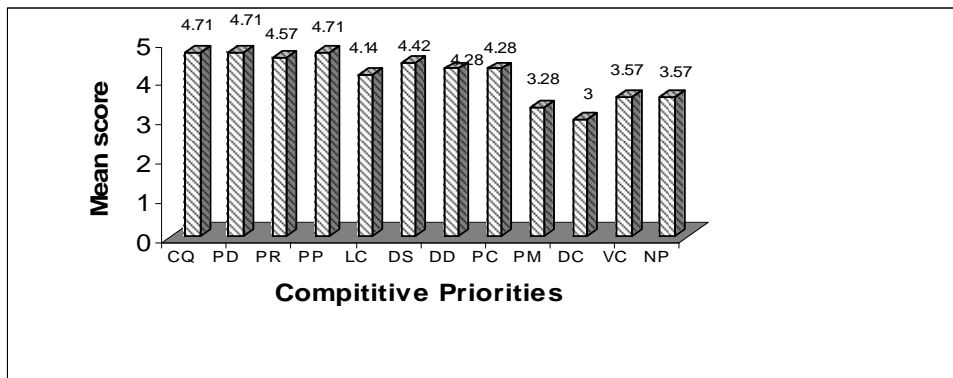


Figure 2.2 (b) Competitive priorities of Tractor sector

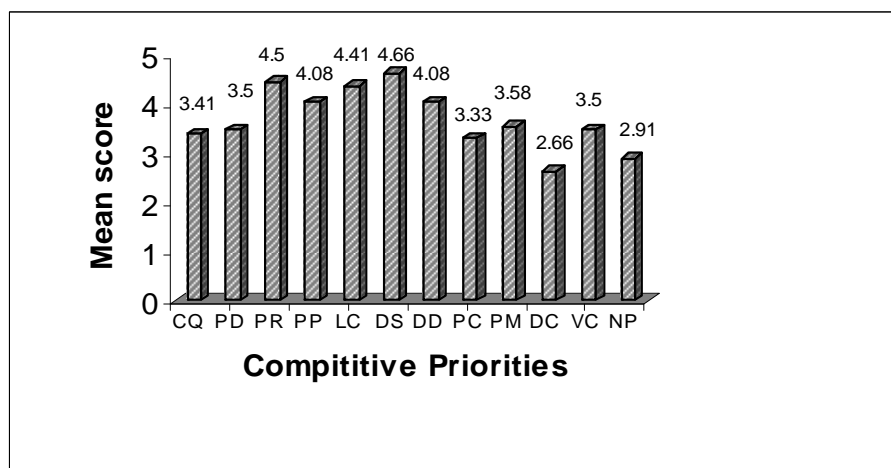


Figure 2.2 (c) Competitive priorities of General manufacturing sector

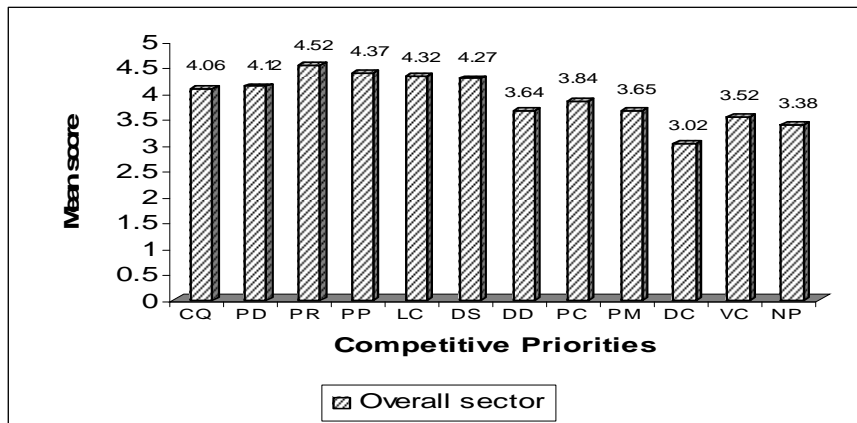


Figure 2.2 (d) Competitive priorities of Overall sector

5. CONCLUDING REMARKS

The studies have been conducted for deeper understanding of various manufacturing competitive priorities of three sector of Indian manufacturing industries viz. automobile (especially two-wheeler), tractor, and general manufacturing. The top five competitive priorities for each sector in descending

order of importance are given in Table 1.3. It is observed that product durability is the top most competitive priority for tractor sector. However, conformance quality is the most important competitive priorities in automobile sector companies. On the other hand, general manufacturing sector companies give high importance to delivery speed.

Sr.No.	Automobile	Tractor	General
1	Conformance quality	Product durability	Delivery Speed
2	Low cost	Product reliability	Conformance quality
3	Product performance	Product performance	Low cost
4	Product reliability	Conformance quality	Product performance
5	Product durability	Delivery Speed	Product mix change

Table 1.3 Top five competitive priorities

It is observed that all forty four manufacturing companies of three sectors which have been surveyed are giving importance to cost(C), quality (Q), delivery (D) and flexibility (F) in descending order. In overall sector, mean score of cost and quality is more than 4.25 and also the difference between mean score of these values is very less (0.05) as compared to delivery and flexibility. This reveals that the overall sectors are emphasizing on cost and quality both, simultaneously. This supports the competitive progression theory proposed by Roth (1996). The finding of Dangayach and Deshmukh (2000, 2001 and 2003) in Indian context also matches well with this observation.

It is also observed that there is an urgent need for the Indian manufacturing firms to evolve the competitive strategy framework for its survival in the domestic competition provided by the both Indian as well as foreign multinational firms. Despite few Indian firms being awarded with Deming prize, the Indian manufacturing industries in general remains indifferent towards the issues related to competitive priorities. India has a great potential to play a significant role

in this new strategy of manufacturing business. The critical success factors for potentialities depends upon the abilities of the Indian firms to link manufacturing strategy with the corporate business strategy through the achievements on various manufacturing performance objectives. Manufacturing strategy must be in terms of the whole range of interconnected policy decisions involved in its total value chain of any product from engineering design through customer service giving due consideration to competitive priorities of that industry to which the firm belongs.

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BIOGRAPHIES



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