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Competition Strategy and Customer Satisfaction: A Practical Research on IC Assembling Industry in Taiwan

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Abstract: The research tries to learn more about the production strategy of Integrated Circuit (IC) assembling industry in Taiwan. The possible existing strategic groups based on the theories of strategic groups and industry characteristics in IC assembling manufactures will be discussed and figured out. And on the basis of the differences among the strategic groups, a structure model of strategic groups, production strategy and core competence can be built to analyze core competence and strategy types among different elements of strategic groups. At last the factor analysis shows the casual relationship among customer satisfaction and strategic group, production strategy and core competence, which then can provide manufacturers to build up the core competence and to develop the competition strategy and to enhance customer satisfaction. The result of the research is including (1) The selection of production strategies has significant impact on customer satisfaction (2) Core competence has great impact on customer satisfaction. "The competence of strategy and management", "the competence of marketing and controlling, the competence of mass production and manufacturing and "the competence of research and development" in the core competence have significant impact on the improvement of customer satisfaction (3) The positioning of strategic groups has no obvious impact on customer satisfaction (4) The selection of production strategy has great impact on core competence (5) The positioning of strategic groups has enormous influence on core competence. And the four positioning of strategic groups and the four types of core competence have great impact as well (6) The selection of production strategy has significant impact on strategic groups.

Key words: Customer satisfaction, IC assembly, core competence, strategic groups

INTRODUCTION

Since ever the theory of "Competitive Strategy" presented by Porter (1990), the discussion regarding to competition advantage and competitive strategy within the business, industry and even countries has been arising and also has drawn attention of scholars and high-tech industries in Taiwan. The production value of Taiwanese IC assembling industry has been standing at the first place worldwide and yet, there isn't a research and discussion concerning the competitive strategy in this industry so far.

IC assembling is highly affected by economy environment. As semiconductors industry slumped in between 1997-1999 and the threshold to get into IC assembling industry isn't significant (high), plenty of manufacturers entered and started to share the limited market with mass production and low price. Consequently, how to maintain the relationship with customers and to create the loyalty of customers has become the major task of IC assembling manufacturers in the competitive environment. And the fatal issues of survival to those companies rely on the maintenance of competitive advantage and the stabilization of business. In the competitive environment, to enhance and maintain customer satisfaction have become the major strategic focus. The research tries to categorize the strategic groups for most of the manufactures in Taiwan and analyze the competitive strategy and core competence among all the IC assembling manufacturers and further to discuss the interrelationship between strategic groups, competitive strategy and core competence and the impact on customer satisfaction. Hence, IC assembling manufacturers will be able to determine the strategy positioning and select a suitable core competence and structure the industry competitive strategy for a better customer satisfaction in accordance with the outcome of research.

LITERATURE REVIEW

Skinner (1969) proposed manufacturing strategy as a process to help firms define the manufacturing capabilities needed to support their corporate strategy. Skinner (1969)

argue that an appropriate manufacturing strategy could provide a competitive advantage in terms of cost, delivery, quality, Innovation, flexibility, etc. Based on Skinner's research, numerous other terms have been proposed by operation management researchers for describing capabilities, like as competitive priorities (Hayes and Wheelwright, 1984; Boyer, 1998), order winner and qualifiers (Hill, 1994) and competitive capabilities (Roth and Miller, 1992). McCarthy (2004) has listed some definition related to above terms as following. These definitions will be considered in the basic elements of the manufacturing strategy in this study.

Resources are the basic constituents of a manufacturing firm. They are the tangible assets such as labor and capital and the intangible and tacit assets such as knowledge and experience.

- Routines are the norms, rules, procedures, conventions and technologies around which manufacturing firms are constructed and through which they operate
- Core competencies are created by developing and combining resources and routines. They influence performance and define and differentiate a firm from its competitors
- Capabilities are a collection of competencies (core or otherwise) that provide competitive advantage in terms of cost, delivery, quality, innovation, etc
- Dynamic capabilities provide a manufacturing firm with the ability to integrate, build and reconfigure resources, routines and competencies that will create new capabilities and a competitive advantage
- Configurations are the resultant form or type of manufacturing firm. They are defined by the collection of resources, routines and resulting competencies and capabilities
- Cost, quality, delivery and flexibility are important competitive priorities. (Dangayach and Deshmukh, 2001) proposed a manufacturing strategy framework. Price, quality, delivery, flexibility and service are considered in their framework. The research will consider all of the elements mention above to build the structure of manufacturing strategy

The understanding of "strategic groups" in this study is in line with the notation of "configurations". Strategic groups are interesting because they attempt to group items based on certain characteristics that can express something about these items' environmental or internal fit. It's generally believed that a high degree of fit should lead to high performance as a result of higher organizational effectiveness (Bozarth and McDermott, 1998). Miller and Roth (1994), Kathuria (2000) have discussed about the strategic groups.

The decision of strategy development is a very important task for strategic groups; it can be also used to evaluate the entering obstacle (Flegenbaum *et al*., 1987). Strategic groups can be used to define competitors and competitors' strategies. Porter (1990) suggested that the companies competing to each other and positioning on the same strategic groups have close relationship. That is to say, the relationships among those companies in the different strategic groups are not significant. Therefore a better assessment to the competitors in the same strategic groups will assist companies to make sure their marketing position and to achieve an effective production strategy. This research has observed and analyzed the strategy positioning, core competence and customer satisfaction for the highly competitive IC assembling industry in Taiwan.

METHODOLOGY

Structure of the research: There are four investigation variances in the research including core competence, production strategy, strategic groups and customer satisfaction. Through a marketing survey to IC assembly industries in Taiwan, the research summaries common factors based on abovementioned variances and have a better understanding of customer satisfaction from the analysis of the correlation of those factors.

This research also classifies companies into different strategies groups based on the investigation of the strategies development, hence, it helps us to understand the strategy behavior of companies. To make it more clearly, as the strategic groups has been defined, the strategy of the close competitors can be traced; the strategies used by the members of the same strategic groups will be similar to each other over a period of time. Consequently, for the future development of production strategy, companies can analyze the niche of competition advantage, core competence and customer satisfaction by observing the production strategy and strategic groups. The structure of this research, which builds an initial statistical model based on the LISREL (Sharma, 1996). The research hypotheses represented in Fig. 1 are described as follows:

- **Production strategy:** Core competence and strategic groups bring significantly impact on customer satisfaction
- **H1:** The selection of production strategy has great impact on customer satisfaction

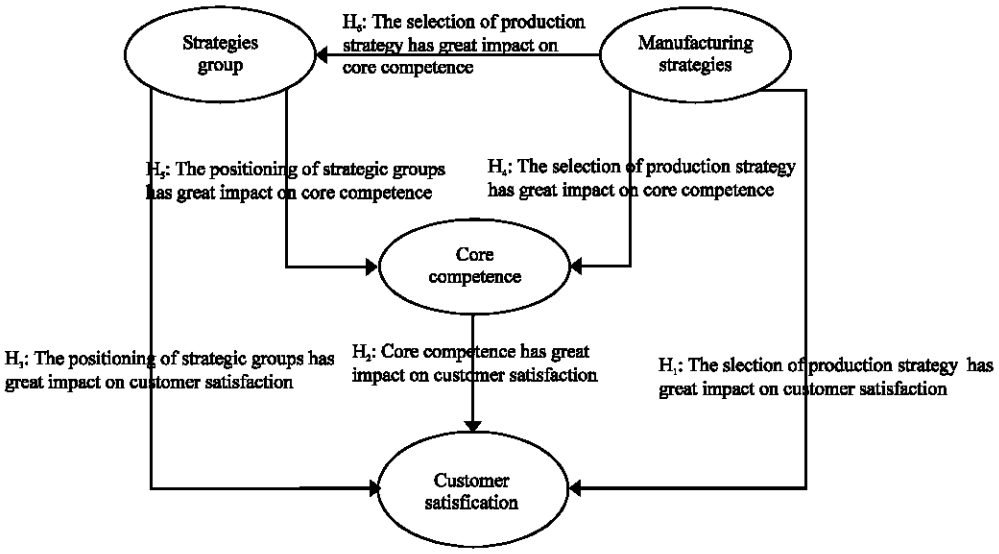

Fig. 1: Hypothesis of research

- **H2:** Core competence has great impact on customer satisfaction
- **H3:** The positioning of strategic groups has great impact on customer satisfaction
- **Production strategy:** And strategic groups bring significantly impact on core competence
- **H4:** The selection of production strategy has great impact on core competence
- **H5:** The positioning of strategic groups has great impact on core competence
  Production strategy: Brings significantly impact on strategic groups
- **H6:** The selection of production strategy has great impact on strategic groups

Definition of variables: Any significant effect and correlation can not be found directly from abovementioned models, which is unknown variables, it is called as "canonical variable". This research contains four canonical variable including: Core competence, production strategy, strategic groups and customer satisfaction. To prove the relationship among those canonical variables, this research selects some common factors as measuring indicators within the observation variables.

Distribution and collection of questionnaire: Industrial Economics and Knowledge Center-Industrial Technology Research Institute Taiwan collects a list of 40 IC assembling companies, excluding the manufacturers only focus on bump, the valid population comes at 37 in total. 37 questionnaires were distributed for the survey, along with the exposition for the questionnaire content both by telephone or face to face. The return of the questionnaire is 30, at the ration of 81%.

Thirty of the surveyed manufacturers (100%) are engaged in IC assembling. Of which 30 samplings, 23 and 24 are engaged in IC test and wafer sorting respectively, taking 76.7 and 80.0% of the total samplings. Apparently turnkey has become the trend in IC testing industry. And 36.7% out of total samplings have been engaged in BUMP. It also shows that the demand of CSP assembling will gradually evolve and IC assembling will be downsized over time.

ANALYSIS OF STRATEGIC GROUPS AND THE CORRELATION

Strategic groups' analysis: In the analysis of strategic groups, firstly, the research use the hierarchical clustering, Ward's Method (Cooper and Schindler, 1998), separates the samples into four groups. Further, the designed four groups will be used as initial seeds of nonhierarchical clustering, K-mean method (Cooper and Schindler, 1998). Five groups are acquired as result of the analysis (Table 1), the strategic positioning of 6 companies in the fifth group is not

Table 1: The strategic group of IC assembling industry

Strategic group	No. of companies	Percentage
Strategy of low cost and differentiation	4	13.3
Strategy of unique technique and specialty	5	16.7
Strategy of marketing oriented operation	9	30.0
Strategy of marketing leadership	6	20.0
Non-clustering strategic group	6	20.0
Total	30	100.0

Table 2: Packaging types of strategic groups of IC assembling industry and the analysis of production types

	Strategic groups				
Packaging type	Strategy of low cost and differentiation	Strategy of unique technique and specialty	Strategy of marketing oriented operation	Strategy of marketing leadership	Non-clustering strategic group
BUMP**	0	1	4	6	0
MODULE**	0	0	3	2	0
WCSP*	0	1	1	6	0
DIP*	4	4	7	6	6
PLCC*	4	4	8	6	6
QFP*	4	5	8	6	6
SO IC*	4	5	9	6	6
BGA*	0	5	7	6	6
TAB*	0	1	3	6	0
Total	4	5	9	6	6

*Packaging type of IC assembling industry, **Production type of IC assembling industry

Table 3: Pearson analysis for core competence and strategic groups

	Core competence			
Strategic groups	Ability of strategy and management, ability of marketing and controlling	Ability of mass production and manufacturing	Ability of service and logistics	Ability of research and development
Strategy of unique technique and specialty	-0.795	0.967	0.372	-0.680
Strategy of low cost and differentiation	0.606	-0.286*	-0.458	0.844
Strategy of marketing oriented operation	-0.852	0.649	0.636	-0.743
Strategy of marketing leadership	0.965	0.728	0.521	0.771

*Pearson's correlation coefficient is not significant at $\alpha = 0.05$

distinct and the evaluation scores are relatively low, thus, the fifth group is namely "Non-Clustering Strategic Group".

Table 2 shows the packaging types after the separation of strategic groups, 4 companies mainly focuses on low-end packaging types in the strategic group of "Low Cost and Differentiation". However in the strategic group of "Marketing Leadership" shows that 6 companies cover high-end and low-end packaging types, though they mainly focus on low-end types, it also includes BGA packaging type.

Analysis of core competence and strategic groups: In the Pearson analysis regarding to "Core Competence" and "Strategic Groups", expect Strategic groups of "Unique Technique and Specialty" and "Mass Production and Manufacturing", all the factors have significant correlation (Table 3).

In the strategic group of "Unique Technique and Specialty", "The Ability of Strategy and Management and The Ability of Marketing and Controlling" and "The Ability of Research and Development" have the better coefficient value, 0.606, 0.844, which presents the importance of the two cores competence in this strategic group. "The Ability of Service and Support" and "the Ability of Mass Production and Manufacturing" are relatively non-important.

In the strategic group of "Low Cost and Differentiation", the coefficient values with "the Ability of Mass Production and Manufacturing" and "the Ability of Service and Support" are 0.967 and 0.372, which shows their importance in this strategic group. That is to say, the two core competences are necessary for those companies positioning at the "Low Cost and Differentiation" group.

In the strategic group of "Marketing oriented Operation", the coefficient value with "the Ability of Mass Production and Manufacturing" is 0.649. The value is 0.636 with "the Ability of Service and Logistics". It has approved the importance of both abilities in this strategic group. "the Ability of Strategic Management and Controlling" and "the Research and Development" is relatively non-significant comparing to the other strategic groups.

In the strategic groups of "Marketing Leadership" four analyzed abilities are required. However "The Ability of Strategy and Management and the Ability of Marketing and Controlling" with the coefficient value of 0.965, it's the most important ability among the four; and the coefficient value with "the Ability of Mass Production and Manufacturing" and "the Ability of Research and Development" reaches a high standard of 0.7.

Analysis of production strategy and strategic groups: The Analysis of Production Strategy and Strategic Groups based on Pearson analysis is showed on Table 4. Quality and flexibility are important in the "Strategy of Unique Technique and Specialty". Due date and cost are important in the strategic group of Low Cost and Differentiation. In the strategic group of Strategy of Marketing Oriented Operation, quality is the most

Table 4: Analysis of production strategy and strategic groups

	Production strategies				
Strategic groups	Due date	Quality	Cost	Flexibility	Service
Strategy of unique technique and specialty	0.296	0.341**	-0.301	0.910*	0.118
Strategy of low cost and differentiation	0.513*	-0.049	0.916*	0.144	0.293
Strategy of marketing oriented operation	0.346**	0.385*	0.304	0.141	0.330**
Strategy of marketing leadership	0.186	0.930*	0.330**	0.707*	0.183

*α: 0.05, **α: 0.1

Table 5: Correlation analysis for core competence and production strategy in strategic groups

Strategic group	Factors of production strategy	Factors of core competence
Strategy of unique technique and specialty	Quality flexibility	The ability of strategy and management, the ability of market and controlling, the ability of research and development
Strategy of low cost and differentiation	Due date cost	The ability of mass production and manufacture, the ability of service and logistics
Strategy of marketing oriented operation	Due date quality service	The ability of mass production and manufacture, the ability of service and logistics
Strategy of marketing leadership	Quality cost flexibility	The ability of strategy and management, the ability of market and controlling, the ability of research and development, the ability of mass production and manufacture, the ability of service and logistics

important factor but it only has the coefficient value of 0.385. In the strategic group of Strategy of Marketing Leadership, quality has high coefficient value of 0.93 and flexibility only has 0.707 but both are considered as important factors.

CONCLUSION AND SUGGESTION

With the use of the theories of strategic groups and statistics, company can be categorized into certain group and then analyzed by correlation analysis of strategic group of assembling industry and core competence, the competition behavior in assembling industry therefore is traced. To be more clearly, once the strategic group is categorized, the marketing positioning and strategy used by the companies in the same group can be learned, the same other strategy will be as well used into the competitive market. Couples reasons from abovementioned phenomenal can be explained; first, they face the same potential assumption for industry future. Second, the members in the same strategic group share similar goals, market and the ability to achieve the goals. Any unexpected situation occurs inside or outside industry, the members in the group normally response the same. Even the currently used strategies are not fully satisfied by companies, they hardly change to different group as the concerns of shifting obstacles and uncertainty for imitation. As the result of correlation analysis, the data approves that production strategy and core competence are the factors affecting customer satisfaction and strategic groups are the factors affecting core competence and production strategy is the factor affecting strategic groups.

In terms of management, to anticipate customers' needs is essential and to choose suitable production strategy is based on the customer segmentation and market situation. Among the analysis concerning management, it is found that in semi-conductor assembling industry, quality flexibility and service in production strategy are the factors affecting customer satisfaction, the ability of strategy and management, market and controlling, mass production and manufacturer and research and development in core competence are the factors affecting customer satisfaction. Through a further analysis for the factors affecting production strategy, core competence and strategic groups, Table 5 provides management with suggestion for measuring core competence of company and choosing strategy positioning, apart from meeting customers needs. In aligned with successful finance, production, sales, company can therefore achieve the strategy goals and meet customers' need by enhancing competitiveness.

It's difficult to define companies' strategic groups and to compare their profit difference without accessing to financial status of surveyed manufacturers, since most of manufacturers in assembling industry are not listed companies and financial status are usually confidential. Amid this research, some of manufacturers can't be grouped due to ambiguous strategy positioning and below average score from each evaluation.

Suggestion for future research: Not many practical researches regarding production strategy or strategic groups for assembling industry have been done in Taiwan, it is suggested that an appropriate and careful

questionnaire concerning abovementioned fields is essential to reflect the real situation of high-tech industry in Taiwan.

As for the research result that didn't come out as original hypothesis, including the correlation of production and core competence, strategic groups and customer satisfaction, further research is required.

It is found that managers in different departments such as merchandise, quality, engineering, production and market/sales have different choices for production strategy in questionnaire. Except to the service factor of production strategy, the results reach a significant standard for the factors of quality, due date, flexibility and price difference. Consequently, a future research about this issue is suggested.

REFERENCES

Boyer, K.K., 1998. Longitudinal linkages between intended and realized operations strategies. Int. J. Operat. Prod. Manage., 18: 356-373.

Bozarth, C. and C. McDermott, 1998. Configurations in manufacturing strategy: A review and directions for future research. J. Oper. Manage., 16: 427-439.

Cooper, D.R. and P.S. Schindler, 1998. Business Research Methods. Irwin McGraw-Hill Co., New York.

Dangayach, G.S. and S.G. Deshmukh, 2001. Manufacturing strategy: Literature review and some issues. Int. J. Operat. Prod. Manage., 21: 884-932.

Flegenbaum, A., J. McGee and H. Thomas, 1987. Exploring the linkage between strategic groups and competitive strategy. Int. Stud. Manage. Org., 18: 6-25.

Hayes, R.H. and S.C. Wheelwright, 1984. Restoring Our Competitive Edge: Competing Through Manufacturing. Wiley, New York.

Hill, T., 1994. Manufacturing Strategy: Text and Cases. Macmillan Press, London.

Kathuria, R., 2000. Competitive priorities and managerial performance: A taxonomy of small manufacturers. J. Operat. Manage., 18: 627-641.

McCarthy, I.P., 2004. Manufacturing strategy: Understanding the fitness landscape. Int. J. Operat. Prod. Manage., 24: 124-150.

Miller, J.G. and A.V. Roth, 1994. A taxonomy of manufacturing strategy. Manage. Sci., 40: 285-304.

Porter, M.E., 1990. The Competitive Advance of Nation. Free Press, New York.

Roth, A.V. and J.G. Miller, 1992. Success factors in manufacturing. Bus. Horizons, 35: 73-81.

Sharma, S., 1996. Applied Multivariate Techniques. 1st Edn., John Wiley and Sons, Inc., New York.

Skinner, W., 1969. Manufacturing-missing link in corporate strategy. Harvard Bus. Rev., 47: 136-145.