

Applying SWOT Analysis to Explore Taiwan Foundry Industry Management Strategy

Che-Wei Chang and Chia Chun Liao

Abstract—The global semiconductor industry is facing slow growth and environmental and technological developments are constantly changing. The foundry industry is facing important changes in strategy and unprecedented management and cost limits. This study uses advantages Strengths, Weaknesses, Opportunities and Threats analysis (SWOT) theory to discuss the future of foundry industry trends and strategic direction. The environmental resources and management capabilities of Taiwan foundry industry are used to maintain the company's strategic advantages to find the best management strategy to provide a reference for the industry. The foundry industry should be based on core products and management advantages, reshaping the company business internal organization in a favorable strategic position to establish product differentiation and management strategies to avoid the cost price trap of cheap competition.

Index Terms—Semiconductor industry, foundry industry, SWOT analysis, management strategy.

I. INTRODUCTION

The global semiconductor industry is facing difficult challenges of growth slowdown and Moore's Law reaching its limit [1]-[4]. The foundry industry is facing unprecedented challenges of fierce competition and reached a critical moment of Moore's Law reaching its limit [2]-[3]. However, the new trend of IDM outsourcing opens a ray of hope [4].

The semiconductor process technology, semiconductor manufacturing equipment investment cost threshold is getting higher and higher [5]. Technology giants can afford the investment costs [6], the other hand for a few small factories the capital must be fabless manufacturing using competitive outsourcing wafer foundries and assembly and test systems [7].

The foundry market is entering a three-tier competitive landscape—the advanced technology, the mature technology and the specialized niche services [8]-[10]. Electronic technology products have become more sophisticated [11].

There is increased demand for additional functionality in more customized products with energy saving, small, thin volume requirements. IC chip design and manufacturing difficulty have increased, driven by the rise of patented intellectual property. Future trends and management

strategies in the foundry industry must consider the Strengths, Weaknesses, Opportunities and Threats analysis (SWOT) in management strategies.

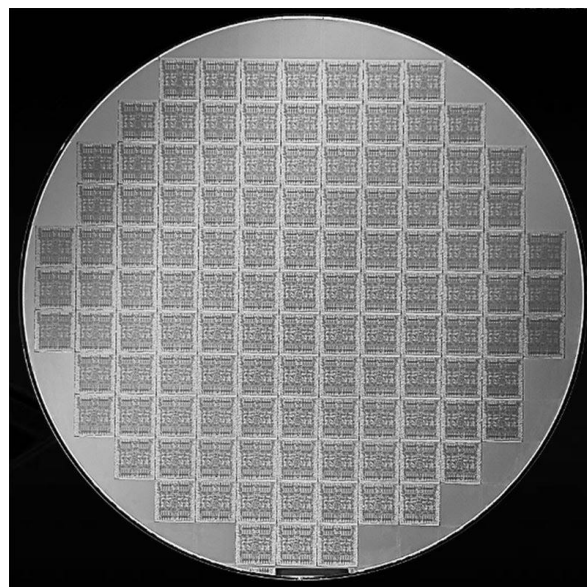


Fig. 1. The Wafer in Semiconductor Industry

In this study, we explore the future trend and competitive strategies of the foundry industry using Albert S Humphrey SWOT analysis theory [12]-[13]. A model company in the global foundry business is selected as a case company. Taiwan-based foundries, with the resources and capability they have, confirmed their competitive advantages, can further combine with the most favorable external opportunities to find out the best competitive strategy as a reference for the industry [14]-[15].

Taiwan foundries have the resources and management capabilities to confirm the advantages of the company's management, combined with the most favorable external opportunities, to further raise the future of the foundry industry management strategy, as directed with government policy.

II. RESEARCH METHODOLOGY

This study used the In-Depth Interview method [16] and SWOT analysis [13] to evaluate Taiwan foundry industry management strategies.

A. In-Depth Interviews method

The in-depth interview is method using unstructured, direct, personal access to during a visit with expert respondents to reveal a problem underlying motivations,

Manuscript received August 10, 2012; revised November 15, 2012.

C. W. Chang is with the Department of Digital Fashion Design, Toko University, No.51, Sec. 2, Syuefu Rd., Puzih City, Chiayi County 61363, Taiwan R.O.C.

C. C. Liao is with the Department of Business Administration, National Central University, No.300, Jhongda Rd., Jhongli City, Taoyuan County 32001, Taiwan R.O.C. (e-mail: jonathan.liao.mis@gmail.com).

beliefs, attitudes and feelings [16]. Group discussions and in-depth interviews are used to obtain an understanding of the issues in the exploratory study. Deep interviews as group discussions use are less common [17]. For example, exploring the deep motivation of target customers for a product can use interviews. In some processes, the researchers eliminate respondents who were self-defensive, using a variety of word association methods, statement completion methods and role-playing skills.

B. SWOT Analysis

Strengths, Weaknesses, Opportunities and Threats analysis (SWOT) are more commonly used in organization or individual analyses in which the status quo of the advantages and disadvantages provide the current situation for the managers as strategic direction for future corporate decision-making basis [12]-[13]. This process can be divided into four areas:

- 1) **Strengths:** organizations and individuals have the expertise.
- 2) **Weakness:** the lack of organizations and individuals.
- 3) **Opportunities:** opportunities and development of the external environment.
- 4) **Threats:** the future of the operating pressure of the external environment.

Considerations mainly from the internal thinking are conducive to the strengths and weaknesses of the industry. Competition, opportunities and threats for the external environment for enterprises to explore the development of management strategies will be used to explore the company's future situation. SWOT analysis from the "Strengths", "Weaknesses," Opportunities "and" Threats "and four for the industry analysis.

This analysis should try to determine the conditions that facilitate analysis. Weihrich proposed the SWOT matrix to develop coping strategies thinking [13]. The advantage in taking into account the company's core competencies will be considered a disadvantage to the company the weakest in that organization or, in the external environment. The opportunity considers what new products to market; while the threat is to consider the market direction of two competitors' strategies.

In summary, the corporate management strategy as stipulated in the enterprise environment is closely related to the impact of good corporate governance allows enterprises to concentrate on the advantages and find the appropriate opportunity to obtain product profitability.

SWOT Analysis Strength and Weakness of the internal environment, the external environment, Opportunity and the Threat, corporate internal environment that is the industry's management of the environment refers to the business organization is influential factors. The management strategy process is a strategic analysis, enterprises in analysis and planning SWOT enterprises better understand the present or future opportunities, threats, strengths and weaknesses, able to grasp and maintain the enterprise management advantages [12]-[13].

III. RESEARCH ANALYSIS RESULTS

This study used the Discussion of the management strategy literature, learned that the internal resources of the "Strength" Weaknesses "and" Opportunities "in the external environment," Threats and management advantages of a considerable degree of relationship, during which the relationship could be further from the SWOT analysis features to assist interpretation [12, 13]. The main theoretical basis for the SWOT analysis is to examine the internal management strategy for facing the internal resources and external environment variables. Quantitative models made from senior executives, business management strategy for the reference direction interviews.

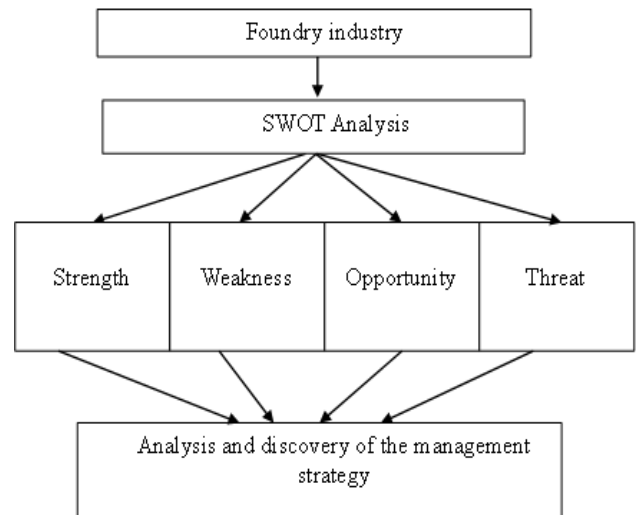


Fig. 2. The Research Framework

The research methods and theoretical framework, supported by the SWOT analysis theory, the four dimensions of the "Strength", "Weaknesses," Opportunities "and" Threats " [12]-[13]. Each dimension takes a number of operating variables for research and analysis to identify the internal and external SWOT environment and external environmental management strategies advantage.

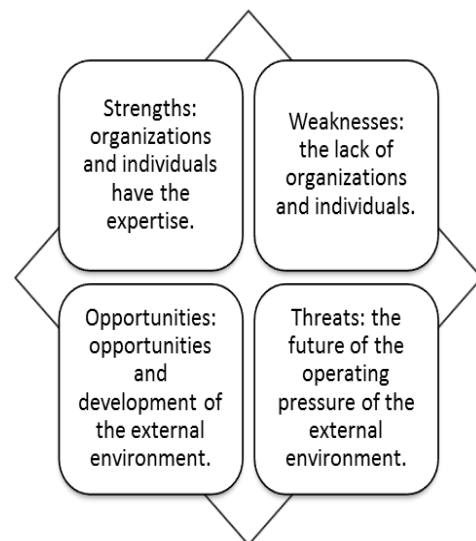


Fig. 3. The SWOT analysis in this study

IV. CONCLUSION

Foundry services to the company's current environmental and resource capacity management strategic advantage select the most effective use of strategic goals, inside and outside the enterprise environment, the opportunities arising from the management strategy has three goals:

A. Technology Leadership

That should step up investment capital, to provide customers and to maintain its advanced process capacity and foundry manufacturing technology capacity, actively working with customers to form a strategic partnership.

B. Manufacturing Excellence

Should be taken to competitive strategy in the three management strategies: cost leadership strategy, differentiation strategy and the strategy of specialization, and the enterprise value chain analysis, and continue to strengthen its core business value and provide an optimal combination of technology, cost low, the value-added services for customers to avoid the cheap cost competitiveness and new profits for themselves and their customers.

C. The Customer Partnership

The proposal should provide IC design eco-system services in order to strengthen long-term partnerships with clients to establish and form a strategic alliance with customers.

The importance of the Taiwan foundry services company principal Strength outstanding senior management talents of the international culture, and advanced technology and customer relationship between the competitive advantage, and a sound financial basis; Weaknesses mainly for research and development costs continue to increase in price competition with each other, and slow down the growth of the semiconductor industry has reached maturity; main opportunities for the new trend of outsourcing, have the ability to continue to invest in manufacturers to develop advanced process technology. Constantly adding new competitors or new competitors, enterprises compete to get into competition in the high-end products.

REFERENCES

- [1] K. R. Andrews, *Concept of Corporate Strategy*, Dow Jones-Irwin, III., 1971.
- [2] P. L. Chang and C. W. Hsu, "The development strategies for Taiwan's semiconductor industry", *IEEE Transaction on Engineering and Management*, vol. 45, no. 4, pp. 349-356, 1998.
- [3] C. A. Aldering, M. L. Sylla, and J. A. Eisenach, "Is there a Moore's Law for Bandwidth?" *IEEE communications magazine*, pp.117-121, 1999.

- [4] B. Jovanovic and P. L. Rousseau, "Moore's law and learning by doing", *Review of Economic Dynamics*, vol. 5, no. 2, pp. 346-375, 2002.
- [5] H. I. Ansoff, *Corporate Strategy*, New York: McGraw Hill, 1965.
- [6] J. B. Barney, "Organizational Culture: Can It be a Source of Sustained Competitive Advantage?" *Academy of Management Review*, vol.11, no.3, pp.656-665, 1986.
- [7] J. B. Barney, "Firm Resources and Sustained Competitive Advantage", *Journal of Management*, vol.17, no.1, pp.99-120, 1991.
- [8] J. B. Barney, *Gaining and Sustaining Competitive Advantage*, Prentice Hall, 3rd edition, 2006.
- [9] A. D. Jr. Chandler, *Strategy and Structure*, Cambridge: Harvard University Press, 1962.
- [10] G. Hamel and C. K. Prahalad, "The core Competence of the Corporation", *Harvard Business Review*, May-June, pp. 117-153, 1990.
- [11] D. A. Aaker, "Managing assets and skills: The key to a sustainable competitive advantage", *California Management Review*, vol.31, pp. 91-106, 1989.
- [12] E. Susan, A. J. Jackson, and L. E. Niclas, "Recent Research on Team and Organizational Diversity: SWOT Analysis and Implications," *Journal of Management*, vol. 29, no. 6, pp. 801-830, 2003.
- [13] H. Weihrich, "The SWOT Matrix-A Tool for Situational Analysis," *Long Range Planning*, vol. 15, no. 2, pp. 54-66, 1982.
- [14] L. P. Mark, "Intel, Samsung to Represent Half of Semi Capex", *SemiMD*, 2012.
- [15] O. John, "IBM, Global Foundries Moving to Gate-Last Technology for 20nm", *bsn*, 2011.
- [16] C. Fryer, S. Mackintosh, M. Stanley, and J. Crichton, "Qualitative studies using in-depth interviews with older people from multiple language groups: methodological systematic review," *Journal of Advanced Nursing*, vol. 68, no. 1, pp. 22-35, 2012.
- [17] S. Marry and J. Defrance, "Analysis of the perception and representation of sonic public spaces through on site survey, acoustic indicators and in-depth interviews," *Applied Acoustics*, February 2012.



Che-Wei Chang is an associate professor of Department of Digital Fashion Design, Toko University. He holds Ph.D. in the management from Ming Chuan University. He is the member of the Operations Research Society of Taiwan and Taiwan Project Management Association.

His major interests are in the area of Semiconductor Quality Engineering, Robust Systems Designs, Software Quality Engineering, System Evaluation, and Grey System and Optimization Theory and Applications.



Chia-Chun Liao received a B. S. degree from Hungkuang University, Taiwan, in 2003, and an M.S. degree from Yuanpei University, Taiwan, in 2010, all in information Management. He is currently working toward the Ph.D. degree with the Department of Business Administration, National Central University, Taoyuan, Taiwan.

He has published over 20 journal and conference papers. Currently, he is the Ph.D Candidate with the Department of Business Administration, National Central University, Taoyuan, Taiwan. His recent research interests are in Cloud Computing, Technology Management, and Service Science