

## **Introduction**

The literature on network learning has advanced toward the stage of differentiating between network's enabling and constraining effects on firms' ability to learn from others. Thus, while Uzzi (1997) speculates on the differences between a homogeneous network and a heterogeneous network, Danneels (2003) and Afuah (2000) address the possibility of getting trapped by one's own current buyers. Here I report a case study based on archival data to trace the development of the LCD business by two firms in Taiwan: Chi Mei (CM) and China Tube (CT). In addition to network theory, I draw on the inertia literature (Burgelman, 2002) and organizational momentum (Miller and Friesen, 1984) to explain the puzzle of why CT is lagging behind CM. Despite coming from a related field (i.e., CRT), with over 30 years of operation, and being the first to mass produce large size LCD panels in Taiwan in 1999, CT not only lags behind CM who entered from the petrochemical field nine years ago, CT is also currently reported to be a likely merger target.

### **China Tube (CT)**

China Tube (CT) was established by Tatung 30 years ago to produce CRT, which at that time was a key part of TV and needed to be imported from Japan. Tatung's founder, Tin-sen Lin, decided to set up CT to wean this overreliance on Japan. Later on, as Taiwan moved up from producing home appliances to IT products, CT became one of the largest CRT monitor producers in Taiwan, neck to neck with Philips Taiwan. This three-decade history in CRT may have cast a long shadow on CT's later development in LCD. Further complicated the picture is the fact that in addition to CRT and LCD, CT has a third display business in PDP. While CRT can be used as the display of TV and then monitor, LCD is used in TV, monitor and notebook (NB). On the contrary, PDP is only good for TV. In essence, CT's PDP and CRT (for TV) may have prevented it from taking a more aggressive approach in using LCD as TV display. In 2004, CT's sales from LCD TV is only 4.15% of its total sales from LCD.

In addition to the long shadow of CRT and the concurrent rivalry of PDP, CT's network in China may further explain why it has not been more proactive in pursuing the most promising segment of LCD, LCD TV. CT has been operating in mainland China for 12 years. All its CRT operation has been moved to China, and rumor has it that CT is involved in setting up a big LCD factory in China. More important, CT's customers for LCD include many large Chinese firms. Since China is not yet a major LCD TV market, it's only natural that CT's LCD business focuses on monitor and NB, not TV.

### **Chi Mei (CM)**

In stark contrast to CT's 4% of total LCD sales from LCD TV, CM derives

more than 20% of total LCD sales from LCD TV. CM has no baggage from either CRT or the IT segment, and its free will to bet on LCD TV is bolstered by at least two factors. First, CM's original core business in the petrochemical industry may appear to be a far cry from LCD, but it actually provides a related foothold in electronic chemical that is heavily used in LCD, particularly the key part of color filter. Second, while CT's major customers are Chinese, CM has long-term relationships with many Japanese dating back to its core petrochemical business. Since Japan was the number one LCD TV market in the world until only a couple of years ago, this Japanese network may further solidify CM's position in LCD TV as opposed to monitor or NB.

Similar to the birth of CT by Tatung's founder, CM's diversification into LCD is orchestrated by its legendary founder, Wen-long Shiu. Before entering LCD, CM was already number one in ABS. The amazing contrast is that while CRT appears to hinder CT's ability or willingness to speed up its involvement in LCD TV, ABS seems to enable CM's bet on it. Many tactics used by CM in its ABS show up again in its LCD TV venture. Building up volume with speed at low cost and with in-house technology is the common theme linking the two seemingly unrelated businesses of petrochemical and LCD.

### The Evidence

While the above two sections sketch out the contrast between CT and CM in their approach to LCD TV, I present some preliminary evidence to support the sketch. I rely on archival data at this stage. Specifically, I collected 21 months of daily news coverage relating to the LCD industry by *Commercial Times*. During the past 21 months, I read *Commercial Times* daily and clipped out stories about LCD. Near the end of the 21 months (October, 2005), I read the pile of news clip again, and sorted them into ten files: (1) the overall industry, (2) stock price, profit and sales, (3) funding, (4) equipment, (5) supplies and parts, (6) mainland China, (7) product lines, (8) China Tube, (9) Chi Mei, and (10) others. After the sorting, I went back to read (7), (8) and (9) again and condensed each of the three files into a list of events description. As a result, the product lines list contains 45 entries, China Tube 57 entries, and Chi Mei 83 entries.

### China Tube (CT)

#### *The Constraining Effect of the Chinese Network on LCD TV*

- 93.9.4 CT will issue one billion issues of new stock in China
- 93.12.23 G.J. (a leading Chinese firm) is currently the largest customer of CT, both in CRT and LCD.
- 94.1.19 CT is looking for alliance with two Chinese LCD firms to address its own lack of the 5<sup>th</sup> generation LCD plant.

- 94.8.5 CT is reported to set up a PDP plant jointly with TCL; CT has been in mainland China for 12 years.
  - 94.9.28 CT received LCD TV order from TCL and Haier.
- The Long Shadow of CRT*
- 93.3.6 CT's CRT sales this year will be NT\$ 36.7 billions, and LCD 78.9 billions.
  - 93.4.10. In March, CT's CRT output is 2.66 million units, a 5.1% increase over last month, and a 22.2% increase over the same period last year.
  - 93.4.16 CT first quarter gross profit margin in LCD is 28% to 30%, while the margin for the whole (LCD, PDP and CRT) is 25%.
  - 93.5.1 CT earnings before tax this year will be NT\$ 17.6 billions, and 90% of that will come from LCD.
  - 93.7.27 CT's CRT currently can't meet its demand.
  - 93.9.11 CT's profit from CRT is estimated be around NT\$ 4 billions, but CRT's profit is much stable than LCD's.
  - 93.9.14 In August, LCD's profit is minimal, while CRT's profit is more significant.
  - 93.11.3 In September, LCD showed several tens of millions dollars loss, while CRT had around 500 million dollars profit.
  - 93.11.8 In October, sales from LCD decreased 12.2%, while CRT increased 7.1%.
  - 94.2.4 Last year, CT's CRT sales is NT\$ 40.5 billions, and CRT profit is 5.5 billions.

### **Chi Mei (CM)**

#### *The enabling Effect of the Japanese Network on LCD TV*

- 93.3.21 CM sales to Japanese buyers is 60% of its total sales.
- 93.3.31 Except for Sharp, the rest of the Big Eight Japanese LCD TV firms have all become CM's buyers.
- 93.4.17 After receiving a big order from Sony, CM's stock price has overtaken that of its largest competitor in Taiwan.
- 93.11.17 A Japanese firm C.J. has invested 2% in CM before, and is looking to increase its holding even more now to secure LCD panel supply.
- 94.1.3 Last year rumor has it that CM is planning to divest IDT which it bought from IBM Japan in August, 2001.
- 94.1.5 CM will sell IDT to Sony for around NT\$ six billions.
- 94.4.2 Three years ago, CM asked seven or eight Japanese suppliers to set up factories in Taiwan. Now CM is doing it again with the LCD TV Special Park in Tainan.
- 94.7.9 CM's mid-level managers training uses Japan as a model.
- 94.10.20 CM is the first LCD firm in Taiwan to attend the Yokohama Exhibition in 1999.

### *The Synergy from the Petrochemical Core Business*

- 93.3.29 CM has never given up on petrochemical; it even uses it to become its LCD's best partner. For instance, the chemical can be used to produce color filter.
- 93.4.23. Wen-long Shiu considers LCD as the combination of machinery, chemistry and electronics. Furthermore, chemistry is the most important part and is exactly what CM is good at.
- 94.4.8 CM's subsidiary, CL, has its roots in plastic coloring. CL is now in charge of CM's LCD supplies and parts.
- 94.5.23 CM decides to produce stray light film in-house with its expertise from the petrochemical core. This venture will give CM 85% of control over its total supplies for LCD TV.

### **Conclusion**

The evidence presented above is only a rough cut of my archival data collected over the past 21 months. Many key themes are yet to be reported in the future. For instance, the family feud among the second generation members of Tatung apparently works against CT. One competing explanation of CT's relatively poor performance may be exactly this family feud. On the other hand, CM's founder, Wen-long Shiu, still exerts a strong, unified influence on CM's LCD business. It is therefore important to trace back in depth his roots in the petrochemical business to discover why this experience enables a seemingly unrelated venture in LCD TV.

While I reported only archival data in the above evidence section, I have also conducted a simple survey on 97 firms in the LCD industry in Taiwan. More refined comparison with the archival data will be the goal of this research for the coming year.

### **References**

- Afuah, A. 2000. How much do your do-opetitors' capabilities matter in the face of technological change? *Strategic Managemen Journal*, 21: 387-404.
- Argote, L. 1999. *Organizational Learning: Creating, Retaining and Transferring Knowledge*. Norwell, MA: Kluwer Academic Publishers.
- Beckman, C.M. & Haunschild, P.R. 2002. Network learning: the effects of heterogeneity of Partners' experience on corporate acquisitions. *Administrative Science Quarterly*, 47: 92-124.
- Burgelman, R.A. 1994. Fading memories: A process theory of strategic business exit in dynamic environments. *Administrative Science Quarterly*, 39: 24-56.
- Burgelman, R.A. 2002. Strategy as vector and the inertia of coevolutionary lock-in. *Administrative Science Quarterly*, 47: 325-357.

- Burt, R.S. 1992. *Structural Holes*. Cambridge, MA: Harvard University Press.
- Chandler, A.D. Jr. 2001. *Inventing the Electronic Century*. New York: The Free Press.
- Danneels, E. 2003. Tight-loose coupling with customers: the enactment of customer orientation. *Strategic Management Journal*, 24: 559-576.
- Dyer, J.H. 1997. Effective interfirm collaboration: how firms minimize transaction costs and maximize transaction value. *Strategic Management Journal*, 18: 535-556.
- Glaser, B.G. & St4rauss, A.L. 1967. *The Discovery of Grounded Theory*. Chicago: Aldine.
- Gulati, R. 1995. Social structure and alliance formation patterns: a longitudinal analysis. *Administrative Science Quarterly*, 40: 619-652.
- Granovetter, M. 1985. Economic action and social structure: the problem of embeddedness. *American Journal of Sociology*, 91: 481-510.
- Hannan, H.T. & Freeman, J. 1984. Structural inertia and organizational change. *American Sociological Review*, 49: 149-164.
- Horng, C. & Huarng, F. 2002. TQM adoption by hospitals in Taiwan. *Total Quality Management*, 13: 441-463.
- Miller, D. 1994. What happens after success: the perils of excellence. *Journal of Management Studies*, 31: 85-102.
- Miller, D. & Fresen, P.H. 1984. *Organizations: A Quantum View*. Englewoods Cliffs, NJ: Prentice-Hall.
- Murtha, T.P. Lenway, S.A. & Hart, J.A. 2001. *Managing New Industry Creation*. Stanford, CA: Stanford University Press.
- Porter, M.E. 1990. *The Competitive Advantage of Nations*. NY: The Free Press.
- Spencer, J.W. 2003a. Firms' knowledge-sharing strategies in the global innovation system: empirical evidence from the flat panel display industry. *Strategic Management Journal*, 24: 217-233.
- Spencer, J.W. 2003b. Global gatekeeping, representation, and network structure: a longitudinal analysis of regional and global knowledge-diffusion networks. *Journal of International Business Studies*, 34: 428-442.
- Uzzi, B. 1997. Social structure and competition in interfirm networks: the paradox of embeddedness. *Administrative Science Quarterly*, 42: 35-67.