



Research Paper

How Does Small-Sized Firm Utilize Its Limited Resource to Develop Priority Competence

Peng-Jung Lin¹, Ching-Kuei Kao²

(1. Department of Business Administration, Fujian University of Technology, Fujian 350014, linpengjung@qq.com; 2. Key Laboratory of LNG Industry Chain, Fujian University of Technology, Fujian 350014)

ABSTRACT: *There are two viable paths for a firm to build competence. On the one side, firms utilize existing technology-oriented resource through inside-out route to develop new competence, on the other side firms utilize existing market-oriented resource through outside-in route to develop new competence. Traditionally, scholars suggests small-sized firm, who usually constrained by limited resource prioritize to develop technology-oriented competence to enter other markets sequentially. However, in practice, we observe contradiction that the TFT-LCD manufacturing suppliers adopt the market-oriented perspective so as to first respond to market demand for order income, and then learn advantage technology from foreign contractors. It is an interesting phenomenon that motive to resolve the gap between the theoretical argument and practice. Thus, we explore the sequential differences between inside-out route and outside-in route, and to differentiate technology competence and market competence. This research was using the extended case method compared two international enterprises that produce TFT-LCD manufacturing equipment. This article found that technology-orientation tends to emphasis more on research and development, organizational learning, innovation and design. On the other hand, market-orientation emphasizes much on the linking relations with other manufacturer, reputation, communication and service innovation.*

KEYWORDS: *technology competence; market competence; resource-based theory; organizational learning theory*

Received 05 December, 2020; Accepted 20 December, 2020 © The author(s) 2020.

Published with open access at www.questjournals.org

I. INTRODUCTION

Adding new competences to the firm's repertoire is important for its continued prosperity in a changing environment has recently become important research focus (Dierickx and Cool, 1989; Floyd and Lane, 2000; Helfat, 2000; Leonard-Barton, 1992; McGrath, 2001; Penrose, 1959). Especially for small-sized firm which are usually characterized by limited resources and scale (Temponi and Pandya, 1995), relative to large and resource-sufficient enterprise, they have difficulties for developing several firm competences simultaneously and due to be constrained by its rarely resources make them usually develop one competence. Thus, small-sized firm shall prioritize to develop one competence, a significant impact on developing enterprise's another competence, and can sequential to promote another competence developing. This is important strategy to small-sized firm for developing competitive competence.

Past research explored the development of firm competence mostly stressed on the process of competence development, for example, Wernerfelt (1984) argued that the key to diversified firms is resources rather than products. This is to say, the dynamic critical for firm entering market is sequential to develop of competences and resources; Danneels (2007) noted that firm's technological competence is crucial key to support customer competence and apply to serve markets. These researches emphasis that it is important to firm for developing firm's competence by sequential. However, they do not give enough attention to reflect on the situation of limited resources and think how small-sized firms use previously competence to build another follow-up competence. Which competence shall prioritize to develop for small-sized firm? Particularly, few empirical studies have focused on small-sized firms sequential to develop competence and consider the strategic thinking over the firm's priority sequence to develop competence.

The purpose of this study was to explore how small-sized firms utilize limited resources sequential to

develop necessary competence for firm's survival and development. In the paper we extend Danneels (2002, 2007) opinions to build a prioritize sequent for small-sized firm to construct competence. On the one hand, we think small-sized firm due to limited resources shall prioritize to develop technology competence and then utilize it to build market competence. On the other hand, we think small-sized firm due to lack of technology resources shall prioritize to develop market competence to survive and then utilize it to build technology competence. Firms are facing two different strategy of competence development, what criteria should be used for firms to select the best development plan is the focus of this study.

Past literature explored about the process of competence development emphasizes on resource-based theory and dynamic competence view noting the dynamic basis of competence development. This studies make up for the loss of past research on competence priority adopting resource based theory and organization learning theory. This studies use resource based theory to analysis dynamic sequence of developing competence (Wenerfelt, 1984; Barney, 1993; Teece, Pisano and Shuen, 1997) using organization learning theory to engage organizations in utilizing existing competences and developing new competences (March, 1991; Levinthal and March, 1993) achieving sequential to build firm's different competence.

This method to carry out this study was using the extended case method (Burawoy, 1991), which analysis small-sized firms sequential to develop different competences by using limited resources and execute what kind strategy of competence development. We interview two international enterprises, manufacturing suppliers of Thin-Film Transistor Liquid Crystal Display (TFT-LCD), use long-term depth interviews. Findings of this study showed that small-sized firms shall prioritize to develop technology competence under the condition of limited resource, scale and rapid changing in technology and then firms leverage technology competence to promote market-competence development by organization learning. On the contrary, small-sized firms shall prioritize to develop market competence under the condition of resource starvation and rapid changing in market and then firms leverage market competence to promote technology-competence development by linking with subcontractor.

II. THEORETICAL BACKGROUND

The research purpose is concerned that small-sized international enterprises utilize its limited resource to develop firm competence in international subcontracting partnerships. A subcontracting partnership is defined in this study as a "cooperative, continued exchange relationship between buyer and manufacturing supplier". More simply, it refers to a vertical and horizontal collaborative relationship established on an international basis for transferring competence. Depending upon the tightness of the contractor and subcontractor relationship, such a bilateral relationship could acquire advance resources and competence and upgrade existing firm competence (Hemmert, 1999).

Chaston and Badger (1999) have noted, organizational learning functions as an antecedent of organizational competences. It will help firm build new competences and enhance existing competences. Particularly, the buyer-supplier relationship in international subcontractor is kind of inter-partner learning has been highlighted in both RBV (e.g., Grant, 1996) and organizational capability literature (e.g., Kogut and Zander, 1992; Nelson and Winter, 1982). By joining in these joint activities, suppliers could combine the buyer's capabilities and resources (Vonderembse and Tracey, 1999). In other words, more chances of working together enable suppliers to acquire more resource associated with buyer's competence. Such resource and competence can then be incorporated into the suppliers own corporate system and become "internalized". Consequently, through inter-organizational learning over time may help firms to build and upgrade their competence (Lee and Chen, 2000).

Therefore, organizational learning is a key building block for firm new competence developing. In other words, firm's competence developing and upgrading can be achieved by organizational learning. By learning we may acquisition, integration and application of new and unique knowledge through experimentation, improvement and innovation by ways of internal activities, such as learning by doing, using, failing and reflecting, and by learning outside in markets from customers, competitors, technological sources and other key stakeholders (Wang and Lo, 2002). In addition, learning refers to dynamic interact with the changing business environment and the sustaining competitive markets (Teece et al., 1997).

Much of the focus of RBT research has been on larger firms, yet smaller firms also face the need to acquire critical resources and competences (Barney, Wright, Ketchen, David, 2001). Penrose (1959: 24) has recognized the importance of resources to a firm's competitive position. She argued that a firm's development is due to the manner in which its resources are utilized. Rubin (1973) argued that firms as resource bundles must process resources to make them useful. Mahoney and Pandain (1992: 365) noted that a firm may achieve rents not because it has better resources, but rather the firm's distinctive competence involves making better use of its resources. In short, those scholars deem that resources must be properly leveraged (Peteraf, 1993) or managed (Henderson and Cockburn, 1994). Especially, small firm's business strategies depend significantly on its organizational resources and capabilities (Barney, 1991; Dierickx and Cool, 1989; Grant, 1991; Rumelt, 1991).

In the case of small firms, limited resource has tended to overlook the importance of external sources of resources and capabilities to firm strategy. This is despite the fact that it has long been recognized that a firm's competitiveness often depends not merely on the capabilities that it can create and exploit internally, but the effectiveness with which it can gain access to sources of resources and capabilities beyond its own boundaries (Howells & James, 2001). RBT basically suggests that firms collaborate for the purpose of combining two sets of resources in a synergistic manner (Penrose, 1959; Wernerfelt, 1984; Conner, 1991; Grant, 1996; Madhok and Tallman, 1998). In other words, a firm forms partnerships with others in order to either gain access to the partner's complementary resources to build its own resources and competences (Dussauge, Garrette, and Mitchell, 2000).

RBT must rely heavily on the concept of dynamic capabilities to analyze change in organizational capabilities. Teece, Pisano, and Shuen (1997: 510) proposed the dynamic capabilities framework 'to explain how combinations of competences and resources can be developed, deployed, and protected'. To do so, firm must alter the resource base by creating, integrating, recombining and releasing resources (Eisenhardt and Martin, 2000).

A resource is a tangible or intangible asset that the firm owns, controls, or has access to and from which it potentially derives rents (Helfat and Peteraf, 2003). By using firm resources to create superior performance (Prahalad & Hamel, 1990) and to combine core resources with complementary resources, firms can generate competitiveness than the competitor (Collis and Montgomery, 1995; 2005). A related point is that the complementary resources that enable value creation from core resources may vary across markets. Thus, investing core resources into a new market or an existing market may create new complementary resources (Bingham and Eisenhardt, 2008: 245) to enhance firm competence.

Competence had commonly been defined as the combination of the knowledge, skills and technology of the enterprise itself (Prahalad and Hamel, 1990; Hall, 1992; Leonard-Barton, 1992; Hamel, 1994), which played a pivotal role in developing firm competence and in configuring of resources that enables the firm to accomplish a particular task (Grant 1991; Helfat and Peteraf, 2003; McGrath, MacMillan, and Venkataraman, 1995). Grant defined a capability as the capacity for a set of individual resources (e.g., patents, know-how, brand names, equipment) to perform some task or activity: '... .. the capabilities of a firm are what it can do as a result of teams of resources working together' (Grant, 1991: 120). He uses the term "capability" interchangeably with "competence". I follow the definition of competence formulated by Grant (1991). Through the acquisition and utilization of suitable resources, competences and knowledge, enterprises can operate more effectively to improve performance and, furthermore, to create competitive advantages (Klemp, 1979; Verdin and Williamson, 1994; Bonger and Thomas, 1994).

A technological competence is the ability of a firm to make certain physical products; a customer competence enables the firm to serve a particular customer group (Benner and Tushman, 2002; Danneels and Kleinschmidt, 2001; Danneels, 2002; Day, 1994; Mitchell, 1992; Moorman and Slotegraaf, 1999; Song, Droge, Hanvanich and Calantone, 2005). Customer competence consists of such resources as knowledge of customer needs, customer purchasing procedures, competitors, distribution and sales access to customers, customer goodwill or franchise reflected in the reputation of the firm and its brands, and communication channels for exchange of information between the firm and customers. Technological competence consists of such resources as engineering know-how, manufacturing facilities and know-how, and patents. (Danneels, 2008)

The paper is organized as follows: First, it describes the methodological procedure. The next section develops a framework "Competence leveraging model (FIGURE 1.)" that depicts competence developing as a vehicle of allocation and transformation among firm resources and upgrading firm competences. Third, the article refers to the path and condition of competence developing on small-sized firm. Fourth, the study depicts the difference from components of both technology and market competence. Fifth, it analyses the strategic thinking of competence development on small-sized firm. Finally, the article concludes with noting the limitations of the present research, and makes suggestions for further research.



FIGURE 1. Competence leveraging model as linking of technology competence and market competence

III. METHOD

My conceptual framework is based on field research and an integration of the scholarly literature regarding small business, organizational resources and competences, organization learning theory, and resources-based theory. I conducted a field study using interviews, observations, and documents (Danneels, 2002, 2007) as data sources from two high-tech firms that produce TFT-LCD manufacturing equipment. The research sites are briefly described in Table 1. Research sites were selected to achieve a diverse sample that provides many possibilities for comparison, which enables richer theory development (Glaser and Strauss, 1967; Strauss and Corbin, 1990). I intended to contrast firms that were different in terms of their variety of resources and products, competence developing and strategy thinking. Rouse and Daellenbach (1999) called for a rich, detailed investigation of the nature of firm resources through comparative case studies. A multi-site study allows for cross-site comparison and allows the researcher to see idiosyncratic aspects of any one site in perspective (Miles, 1979).

Table 1 Research sites

Firm pseudonym	Areas of activity	Age	employees/annual sales in \$ billion	Number of interviews/ observations conducted	Research period
ARET	Automation equipment, micro-drill the entire factory equipment, micro-drill	Since 1982 27years	489/4.25	5 interviews 5 interviewee	
NEDA	Robot design, Robot application, Automation skill, Moving system, Processing machinery, Clean room equipment design, Pack/unpack system, Control system application	Since 1978 31years	577/5.4	5interviews 3 interviewee	3th, Mar, 2006 to 28th, Feb, 2014

Triangulation of various types of data collected through different methods can overcome the limitations of one method by counter-balancing the weaknesses of one method with the strengths of another (Jick, 1979). I used various types and sources of data to provide a rich and solid foundation for the theory development. I conducted 12 interviews with organizational members involved in existing resources and competence development to assess their perspectives on experiences with new resources and competence development. Interviewees were drawn from multiple functional areas (e.g., R&D, marketing, manufacturing), and from various organizational levels. Data about development processes and projects were compared and integrated across informants. Interviews commonly lasted from 45 minutes to two hours, and were tape-recorded (Table 2). The tapes were transcribed verbatim, which generated transcripts.

Table 2. Formal research interview

Type of institution	Name of institution	Interviewee's title	Date of interview
Optoelectronic equipment suppliers	NEDA	Vice President	12 th Jan, 2006 9:00-12:30
		Former General Manager	6 th Aug, 2007 13:30-15:30
		Vice President, Deputy Director	17 th Jun, 2008 09:00-13:00
		Director, Deputy Director	24 th Jun, 2009 10:00-12:00
		Deputy Director	14 th Sep, 2010 13:00-15:00
		Director of Equipment Production	31 th Oct, 2009 10:00-12:00
Optoelectronic equipment suppliers	ARET	President, Director of Equipment Production	19 th Dec, 2010 10:00-12:00
		Assistant Manager of Production Insurance	28 th Apr, 2011 10:00-12:00
		Director of Equipment Production	30 th Jul, 2012 10:00-12:00
		Deputy Section Chief	27 th Aug, 2013 10:00-12:00

I used the extended case method (Burawoy, 1991) as a guide to data analysis. This methodological approach uses empirical data gathered through case study to reconceptualize and extend theory. This study helps to the integration of practical perspectives, concepts and theories by using the extended case method, which aims to integrate, synthesize and stretch existing practical perspectives, concepts and theories. The process involves the interplay of existing concepts/theories and analysis of empirical data. Data analysis points to relevant practical perspectives, concepts and theories in the literature, while simultaneously the literature provides conceptual frameworks to aid in the interpretation of the data. This approach to data analysis is highly similar to that of Rafaeli and Sutton (1991: 757), who developed their insights by ‘an iterative process of traveling back and forth between the data, pertinent literature, and emerging theory.’

To test the credibility of my interpretations of the data, I subjected my analysis to member checks

(Hirschman, 1986; Lincoln and Guba, 1985). I checked my emerging insights on an ongoing basis with my informants, asking for their feedback, sometimes in a second interview. In addition, I made presentations of my findings to the participating firms.

It is worth for two cases to exploring the path and condition of competence developing, and the strategic thinking on business policy because of ARET from lighter transition to automation equipment. So do NEDA, due to sustain innovative and R&D competence, the company has been undergoing constant restructuring to competence upgrading.

SMALL-SIZED FIRM AND COMPETENCE DEVELOPMENT

Firm competence developing bases on firm existing resources and competences, or requires resources and competences the firm does not yet have. These options are conceptualized as resource allocation and resource transformation. It requires current competences may be used as leverage points to exploit new competences.

In terms of their needs, firm executes available resources, activities, and competences and allocation and transformation of firm resource to apply in technology and market competence developing. In addition, firm carries out the allocation and transformation of competence through the coordination / integration, learning / upgrading and reconfiguration (Teece et al., 1997) and applies in the technology and market competence upgrading.

The allocation of resources means that the company's generic resources easy to transform into specific resources (Maritan, 2001; Noda and Bower, 1996; Noda and Collis, 2001), generic resources for the general purpose have a highly fungible (Teece, 1986a), for example: financial resources have a highly fungible can be applied to any level; specific resources have a limited fungible can be used only for special tasks.

The transformation of resources means that transform the general resources into specific resources, for example: combination of existing and new technology to upgrade the technology level, and then apply for a patent.

Managers coordinate or integrate resources, activities and competences inside the firm. How efficiently and effectively internal coordination or integration is achieved is very important (Aoki, 1990). So do external coordination or integration. Specially, firm requires the integration of external activities, technologies and markets (Teece, Pisano, and Shuen, 1997: 518-519). The growing evidences the importance of internal and external coordination and integration. For example: TFT-LCD manufacturers link other companies with market-level for technology cooperation, distribution, customers, and firms.

TFT-LCD manufacturing equipment industry is in a rapidly changing environment, firms' resources allocation must carry out reconstruction and transformation and respond in changing environmental, which is necessary for organization.

THE PATH AND CONDITION OF COMPETENCE DEVELOPMENT

To describe the evolutionary trajectories and paths of competences (Helfat, 1994)

Consequently, a firm's choice of strategy is constrained by its current stock of resources and capabilities and the speed at which it can acquire or accumulate new ones (Collis & Montgomery, 1997). Thus, the RBV emphasizes that successful strategy is based on a firm's ability to identify, accumulate and deploy resources and capabilities that match particular market opportunities and are difficult for competitors to obtain or imitate (Teece & Pisano, 1994).

The technical innovation enhances the value of the firm's market-related competence (Tushman and Anderson, 1986). Such cases stand in sharp contrast to those in which major product innovation leads to major changes in market segmentation.

Small-sized firms prioritize to develop market competence based on the existing competence of communication and reputation for customer service, and resolve customer problems by exploiting new technology, and then expand other new markets with different field of customer interaction, promote the development of technology competences.

TECHNOLOGY COMPETENCE

Technology competence is constituted by tangible and intangible resources (Mitchell, 1992), and with the existing technology to exploit new applications and extend to the market or combine of existing technology and new technology to explore the market. It is known as the technology competence. Manufacturers should construct what kind of technology-oriented competence to enter other market, citing interviews with the following data analysis:

According to interviews, technology competence is constituted by such technology-related resources and competence as: manufacturing and design competences, quality control competences, R & D and innovation competences, and integration and learning competences (Table 3), cited as follows:

(Technology competence) To produce new products, prompt to the market and to do authentication, and then continuing to improve its operation more stable, so that greater output (NEDA Director).

Table 3. Technology competence and market competence

Categories Component	technology competence	market competence
basic competence	♦Manufacturing and design ♦Quality control	♦Reputation ♦Communication
composite competence	♦Integration knowledge ♦Learning knowledge ♦R & D	♦Linking ♦Competitor knowledge ♦Customer knowledge
architectural competence	♦Innovation and creativity	♦Service innovation

Technology competence gives the firm the competence to design and manufacture physical products (Danneels, 2002:1103). TFT-LCD manufacturing industry is highly customized, manufacturers need to consider customer requirements, and then design, manufacture related manufacturing facilities that firms must have manufacturing and design competence, citing interviews with the following information:

(Manufacture competence) It takes 50 seconds to produce a drill, trying to upgrade technology to 12 seconds, so that firm construction manufacturing competence (ARET Director).

Technology competence is constituted by such technology-related resources and competence as: know-how of manufacturing facilities and procedures for quality control (Danneels, 2002). In the TFT-LCD industry, it is very important for firm to have quality control. Because the manufacturing equipment is completed, the actual operation needs to see the status of the operation, if a circle is wrong, the loss will be very serious, and then requires continuous detection. It is also very important to avoid the breakdown of the glass panels resulting in loss of manufacturers, needs to test end product. Interview quoted as follows:

(Competence for quality control) When there are any problems in manufacturing process, customers will ask you to make some response in crucial analysis, to prevent these problems again, and then firms gradually entered the field of manufacturing equipment detection (ARET Director).

Integrative competences enable firms to combine the wide-ranging capabilities, information, perspectives and knowledge necessary to develop products or services in the market-space (Grant, 1996), to generate new applications of existing knowledge (Kogut and Zander, 1992) and guide the problem-solving strategies that shape the development of new competence (Henderson and Cockburn, 1994). It relates to the ‘ways in which the components are integrated and linked together into a coherent whole’ (Henderson and Clark, 1990). Integration can also be about integrating resources from external sources such as suppliers or customers, they are routines allowing the linking of customers’ experience with engineering design or suppliers with production processes (Bowman, Ambrosini, 2003).

It is important for manufacturers to train and cultivation of learning competence, and help to enhance technology competence. It is no wonder that many researchers have drawn the same conclusion that, in today’s knowledge intensive society, the only ultimate source of competitive advantages for a firm is to learn faster than its competitor (Wang and Lo, 2003). Learning is ‘a process by which repetition and experimentation enable tasks to be performed better and quicker’ (Teece et al., 1997). This key factor is learning, different levels of learning, from individuals, to groups and to organizations.

In the long run, enterprises must be able to learn at a rate at least equal to environment change if they are to develop and maintain competitive advantages that have value in the market. In addition, the rate of learning within an organization must be at least equal to that of competitors if changes in market performance are to be expected. Furthermore, the success of the learning activities should be addressed by performance measures (Prahalad and Hamel, 1990), which means that learning activities have influential impacts on business competitiveness. Only in this way, can businesses that possess the ability to learn rapidly about changing environments and act timely on them, be best positioned to achieve competitive advantage. Interview quoted as follows:

(Competence for learning) The company needs more people to help in transition, and uses continuous learning to exploit more products that makes company a power in transition (ARET Director).

TFT-LCD manufacturing suppliers need to persist R & D, NEDA and ARET attaches great importance to R & D talent. For examples: ARET continuous R & D of micro-drill to significantly reduce manufacturing time and cost savings, but also increase revenue. Interview quoted as follows:

(Competence for R & D) NEDA betting the cost of innovation, with the turnover will not decrease. The company's R & D manpower have half of total staff number (NEDA Director).

Innovation is associated with creativity, with the generation of new ideas, but also with initiative and risk taking. Innovation entails bringing new ideas to fruition in the marketplace, satisfying demands, or creating

new needs, in a process that improves overall welfare (Conceicao and Heitor, 2002). Innovation competences can be considered as a subset of dynamic organizational capabilities. They are defined by Burgelman, Maidique and Wheelwright as 'the comprehensive set of characteristics of an organization that facilitate and support innovation strategies'. By way of example some innovation capabilities are mentioned here, such as the capacity to understand competitors' strategies, industry evolution and the firm's technological environment (Burgelman, Maidique and Wheelwright, 1996).

TFT-LCD industry needs to continue innovation, both NEDA and ARET attaches great importance to R & D talent. For examples: ARET tries continuous innovation of micro-drill to significantly reduce manufacturing time and cost, but also increase revenue. Interview quoted as follows:

(Competence for research and innovation) NEDA will not decrease the investment cost of innovation that with the firm's income decline. The R & D manpower of the company exceeds 1 / 2 total staff number (NEDA Director).

IV. MARKET COMPETENCE

Market competences are defined as the processes designed to apply the collective knowledge, skills and resources of the firm to the market related needs of the business, which add value to its goods and services so as to meet the competitive demands of customers. Therefore, they are based on a profound understanding of customers' current and future needs, preferences, factors affecting them and knowledge of competitors' possible action (Kohli and Jaworski, 1990). So there are two important elements of market competences in nature: competitor knowledge and customer knowledge and access, which are usually supported mainly by input assets, channel assets, customer assets and market knowledge assets (Paul and Peter, 1994).

It can anticipate more accurately the response to actions designed to retain or attract customers, improve channel relations or thwart competitors, and act on market information in a timely, coherent manner, which has significant implications for attainment and sustainability of competitive advantage. To help organizations deal with market events and trends, specific internal supporting processes can be developed to harness valuable data from customer surveys and other market research, to learn what buyers want, and to deliver the value they desire (Moller and Anttila, 1987; Slater and Narver, 1994).

Market competence gives the firm the competence to serve certain market and to executive certain customer demand that posed by the tangible and intangible resources, and then by the existing orders incomes to exploit new technology applications or combine with the existing and new orders to explore new technology competence. 'Market' denotes a broader concept, namely the exchanges of goods and services between customers and suppliers, and the effects on these exchanges of environmental factors such as technology, laws, culture, and competition.

Market is constituted by such market-related resources and competences as: linking with other organizations, customers, supply chain and distribution, communication with intra-firm and external-firm, reputation of the firm and brand and service innovation etc.

TFT-LCD manufacturers respond to large-size panels demand, to build 8.5-generation manufacturing plants take 60 billion NT dollars (8.5-generation sputtering machine as an example), it is difficult for manufacturers to input huge costs in production, due to the costs and risks too high. They can only first respond to market demand orders, learning by doing and then build the technology competence, which is from market to technology, firms must priority develop market competence; Danneels (2002:1102) "Customers competence" means the competence serve to customers, the "market factors" did not into consideration, especially TFT-LCD manufacturing firms are large size, heavy weight, and high cost of delivery must be closer to market, as well as attention to customer service. In this study, we extend "Customers competence" (Danneels, 2002) to construct market competence, which is a larger scope, wider application, and infer to the perspective "from market to technology".

Customer first identifies manufacturer reputation and competence, execute orders by the firms. Moreover, manufacturers choose to first respond to market orders (customer), and then build technology competence. Thus, market competence is constituted by such market-related resources and competence as: linking, reputation, communication and service innovation, analysis as follows:

Customers select manufacturers that focus great importance intangible knowledge assets on the company's organizational culture, business ethics, and its evaluation. As long as there is no problem with the company's reputation, they provide design drawings, engineers and together produce with manufacturers, which will be able to learn professional skills among which, with the company's existing professional technology competence, explore new skills (Interview data from ARET).

What is more, reputation also can be beneficial in establishing and maintaining relationships with key suppliers, distributors, and potential allies (Wang and Lo, 2002).

Reputation) Foreign manufacturer's technology has patent right protection, customers select your company basically look at the company's culture, business ethics and its evaluation on your company. As long

as business ethics is well, foreign manufacturer would help company technology upgrading (ARET Director) .

It is very important for firms to communication with internal and external the firms, especially internal between technology personnel and employees need to still discussion and communication with the technology level and problem solving, and also need to maintain good interactions with external customers, which involves intra-organizational and inter-organizational coordination and communication, that has far-reaching and direct impact on the follow-up cooperation.

(Communication) NEDA develops a knowledge management platform to provide professional engineers and staff sharing, communication and problem-solving (NEDA Director).

However, in recent years, evidence has accumulated suggesting that resources of alliance partners transferred via direct interfirm interactions have a considerable impact on firm performance. These resources can be referred to as *network resources* that extend the opportunity set of the firm (Gulati, 1999). By linking with external is very important, because TFT-LCD manufacturing firm needs to combine with organizations, customers, manufacturers and distribution systems and then completely finished. For example: some of the higher technology levels to A Company, relatively simple to B Company. In sum, that is division of labor. In addition, it is larger size, heavy weight, high input costs for flat panel display manufacturing equipment that we will link the customer side with distribution systems to save costs.

(Linking manufacturer) It is a high capital-intensive, high tech-intensive industry for the flat panel display, in particular, that must now still largest to cross the threshold and have to link with other manufacturers (ARET Director).

Day's (1994) characterization of marketing capability as consisting of market sensing and customer linking, and to Moorman and Slotegraaf's (1999) characterization of marketing capability as the firm's ability to develop and maintain customer relationships (Danneels, 2008; 521).

Services will no longer be by telephone, internet to carry out customer service or advice, this kind of "oral to customers" services are no longer appropriate, should be paid "foot to customers" and "hand to customers " services, that is, direct visit to assist customers to solve the problem, and practical exercises operational processes, such as service quality (Gronroos, 1988; Parasuraman, Berry and Zeithaml, 1991; Zeithaml, Berry and Parasuraman, 1990; Anderson, Fornell and Lehmann, 1994) and interactive way to solve customer problems, satisfy customer demands.

(Service) Technology staff and operational staff need together to serve customers to solve the problem that manufacturers first inquiry technology staff, which is Customer Service (ARET Director)

Meyer and Utterback noted that ' . . . for technology-based firms, it is more difficult to learn about new markets than it is to learn about new technologies' (Meyer and Utterback, 1995: 302). In other words, the lack of market competence in a technology-focused firm may inhibit access to new customer bases. Thus, by developing technology competence learns new markets knowledge and experience and then facilitates the development of firm's market competence.

V. CONCLUSIONS AND IMPLICATIONS

The goal of the paper is to integrate and extend existing theory by employing the empirical and practical data to fill in its gaps, reveal its flaws, elaborate its meaning, and extend its coverage. This suggests that competence developing in a developing country would continue to depend on considerable foreign technological inputs and local effort and knowledge. The evidence in this paper has shown that both internal and external knowledge played important roles in competence developing.

Furthermore, as there is no value for customers if marketing competences or technology competences are isolated, it is vital for the firm to integrate both competences to reflect both customer demands and technological trends, and to use new technology to realize innovative services and products.

The purpose of this paper is to disentangle the differences of technology-oriented market and market-oriented technology, the linking role of competence leveraging, and the priority decision factors of technology or market competence building.

The crucial priority factors in technology or market competence lies in costs and risks. The reason for manufacturer responds to demand for large-size panels is that TFT-LCD manufacturing equipment is expensive, large, heavy weight. For example: 8.5-generation Sputtering, it is posed by six billion NT dollars, 40 meters length, 10 meters wide, weighs 200 tons, the cost has not yet been included in hidden costs such as the trial, acceptance, distribution and services, sometimes takes one year to test, during which the costs and risks can not bear for company.

In short, it is a high capital, high-tech, high customization, and high-risk industries for TFT-LCD that firms must also make any changes to match the requirements of customers tailor-made, and different generations panel have different specifications, size, and the process. Based on this phenomenon, manufacturers did not obtain orders premise and bears high risk on investing rashly the huge capital, technology, is extremely unlikely. Therefore, firms priority response to market demand orders, and then construct technology. It is worth

follow-up tracking that this opinion is the contribution of the study and different from resource-based theory.

Compared with lower-cost equipments such as washing machine, manufacturers produce physical equipment by their own professional technology advantages, and extend to the market of strength, then testing by the market and customers. Manufacturers select technology priority, and then extended to the market, consistent with the resource-based theory.

The key role of competence leveraging is in response to environmental changes, then coordination / integration, learning / upgrading and reconstruction of the firm internal and external resources, activities and competences, and to apply in technology and market competence building. This linking role is to help organizations decision-making of technology or market priority.

Technology competence and market competence is component of three parts such as the basis competence, combination competence (Kogut and Zander, 1992) and architectural competence. Basic competence refers to enterprise bases on its existing general resources and develops the basic skills; combination competence is an enterprise with its existing resources and skills to develop new skills by learning and linking with network and combine both; architectural competence refers to enterprise in response to environmental change and organizational needs, to construct competence through innovative thinking.

It is particularly effective when intangible core competence is knowledge based. The reason is that knowledge-based competence may typically fungible across different markets and within the same market at different times. In contrast, tangible physical competence often has specific and limited use. Thus, intangible competence have high fungible are likely to be valuable in multiple markets and tangible competence have limit fungible are likely to be limited in one market.

Theoretical Implications

TFT-LCD manufacturing suppliers face of much challenges such as the competition of major foreign manufacturers, technology-intensive, capital-intensive, by building technology competence and market competence will strengthen the localization manufacturing and increase the rate of self-made, to help manufacturers enter international markets and face rapidly changing environment. More importantly, manufacturing suppliers will have industrial competitiveness and competitive advantage.

Resource-based scholars have started to focus much more on the dynamic nature of competence, asking how competences and resources evolve over time (Helfat, 2000). Resource-based view is from the angle of the intra firm (inside-out) that lacks the thinking of market, this paper is from the angle of external firm (outside-in) tries building market competence to make up, and to increase the concepts of dynamic learning competence and dynamic interactive competence will help firm respond to environmental changes.

Managerial Implications

TFT-LCD manufacturing suppliers spend huge manufacturing costs that manufacturers first invests on technology research will have concerns of orders and profitability. Even if the manufacturing technology can support, the lack of orders for commitment will greater burden on manufacturers, to choose first in response to market demand orders, and then to build technology competence is priority considered for enterprise survival.

Manufacturers execute the thinking of market-oriented technology should strengthen dynamic interaction competence to face the changing market, must have the competence of rapid response and communicate with customers, other manufacturers, competitors and distribution mechanisms, and then have competitive advantages of market that can attract customer orders and build new technologies.

Manufacturers execute the thinking of technology-oriented market should strengthen dynamic learning competence to face the changing technology, must have the competence of rapid absorption and learning on manufacturing power, design power, research and development power, and integration power, and then have competitive advantages of technology that can attract customer orders and explore new markets.

Future Research

In this study, there are two questions for future research. At first, competence leveraging acts as the linking role of technology and market competence, the connotation of this process, should be more detailed analysis and discussion, including the past experience of organization, environmental changes and organizational requirements etc.

Wernerfelt modeled a resource-product matrix as a useful strategic tool for developing the fit between the firm's resources and product (market). The dynamic entry new markets relies on the development of new technology competence and then sequential entry other markets, from a position of strength (Wernerfelt, 1984:176). This is the priority of technology-orientation competence.

Second, TFT-LCD manufacturing suppliers due to the considerations of cost and risk, manufacturers first choose to respond to market orders, and then construct technology competence. This is the priority of market-oriented competence, and that is obviously different with resource-based theory. It is a worthy deeper

research that the cost factors how do interfere with resource-based theory?

REFERENCES

- [1]. Amit R, Schoemaker PJH. 1993. Strategic assets and organizational rents. *Strategic Management Journal* 14: 33–46.
- [2]. Andrews, K.R. 1971, *The Concept of Corporate Strategy*, Dow-Jones Irwin, Homewood, Ill.
- [3]. Aoki, M. 1990, The participatory generation of information rents and the theory of the firm. In M. Aoki, B. Gustafsson and O. E. Williamson (eds.), *The Firm as a Nexus of Treaties*. Sage, London, pp. 26–52.
- [4]. Barney JB. 1986. Organizational culture: can it be a source of sustained competitive advantage? *Academy of Management Review* 11: 656–665.
- [5]. Barney, J.B. 1991. Firm resources and sustained competitive advantage. *Journal of Management* 17: pp.99–120.
- [6]. Bingham CB, Eisenhardt KM. 2008. Position, leverage and opportunity: a typology of strategic logics linking resources with competitive advantage. *Managerial and Decision Economics*, 29:243-245.
- [7]. Burawoy M. 1991. Ethnography Unbound. University of California Press: Berkeley, CA.
- [8]. Caves, R. E. 1980. Industrial organization, corporate strategy and structure, *Journal of Economic Literature*, Vol:58 pp.64-92.
- [9]. Chatterjee, S., & Wernerfelt, B. 1991. The link between resources and type of diversification: Theory and evidence. *Strategic Management Journal*, 12: 33-48.
- [10]. Collis DJ, Montgomery CA. 1995. Competing on resources. *Harvard Business Review* 73(4): 118–128.
- [11]. Collis DJ, Montgomery CA. 2005. *Corporate Strategy: A Resource-Based Approach*. McGraw-Hill: Boston.
- [12]. Danneels E, Kleinschmidt EJ. 2001. Product innovativeness from the firm's perspective: its dimensions and their relation with project selection and performance. *Journal of Product Innovation Management* 18(6): 357–373.
- [13]. Danneels, E. 2002. The dynamics of product innovation and firm competences. *Strategic Management Journal*, 23: 1095-1121.
- [14]. Danneels, E. 2007. The process of technological competence leveraging. *Strategic Management Journal*, 28: 511-533.
- [15]. Glaser B, Strauss A. 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine: Chicago, IL.
- [16]. Grant RM. 1991. The resource-based theory of competitive advantage: implications for strategy formulation. *California Management Review* 33(3): 114–135.
- [17]. Helfat CE. 2000. Guest editor's introduction to the special issue: the evolution of firm capabilities. *Strategic Management Journal*, Special Issue 21(10/11): 955–959.
- [18]. Hoopes DG, Madsen TL, Walker G. 2003. Why in there a resourced-based view? Toward a theory of competitive heterogeneity. *Strategic Management Journal* 24: 889–902.
- [19]. Jick TD. 1979. Mixing qualitative and quantitative methods: triangulation in action. *Administrative Science Quarterly* 24(4): 602–611.
- [20]. Knudsen T., Madsen T.K. 2002. Export strategy: dynamic capabilities perspective. *Scandinavian Journal of Management* Vol.18, P.P.475–502.
- [21]. Makadok R. 2001. Toward a synthesis of the resourcebased and dynamic-capability views of rent creation. *Strategic Management Journal* 22: 387–401.
- [22]. Maritan CA. 2001. Capital investment as investing in organizational capabilities: an empirically grounded process model. *Academy of Management Journal* 44(3): 513–531.
- [23]. McGrath RG, MacMillan IC, Venkataraman S. 1995. Defining and developing competence: a strategic process paradigm. *Strategic Management Journal* 16(4): 251–275.
- [24]. Mitchell W. 1992. Are more good things better, or will technical and market capabilities conflict when a firm expands? *Industrial and Corporate Change* 1(2): 327–346.
- [25]. Moorman C, Slotegraaf RJ. 1999. The contingency value of complementary capabilities in product development. *Journal of Marketing Research* 36(2): 239–257.
- [26]. Noda T, Bower JL. 1996. Strategy making as iterated processes of resource allocation. *Strategic Management Journal* 17(7): 159–192.
- [27]. Noda T, Collis DJ. 2001. The evolution of intraindustry firm heterogeneity: insights from a process study. *Academy of Management Journal* 44(4): 897–925.
- [28]. Penrose E. 1959. The Theory of the Growth of the Firm. *Basil Blackwell: Oxford*.
- [29]. Peteraf MA. 1993. The cornerstones of competitive advantage: a resource-based view. *Strategic Management Journal* 14: 179–191.
- [30]. Prahalad CK, Hamel G. 1990. The core competence of the corporation. *Harvard Business Review* (May–June): 79–90.
- [31]. Priem RL, Butler JE. 2001a. Is the resource-based 'view' a useful perspective for strategic management research? *Academy of Management Review* 26(1): 22–40.
- [32]. Rafaeli A, Sutton RI. 1991. Emotional contrast strategies as means of social influence: lessons from criminal interrogators and bill collectors. *Academy of Management Journal* 34(4): 749–775.
- [33]. Rouse MJ, Daellenbach US. 1999. Rethinking research methods for the resource-based perspective: isolating the sources of sustainable competitive advantage. *Strategic Management Journal* 20(5): 487–494.
- [34]. Strauss A, Corbin J. 1990. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Sage: Newbury Park, CA.
- [35]. Teece DJ. 1986a. Profiting from technological innovation: implications for integration, collaboration, licensing and public policy. *Research Policy* 15(6): 285–305.
- [36]. Teece, D. J. Pisano, G. and Shuen, A. 1997. Dynamic capabilities and strategic management. *Strategic Management Journal*, Vol. 18:7, 509–533.
- [37]. Wernerfelt, B. 1984. A resource-based view of the firm. *Strategic Management Journal*, 5: 171–180.

Peng-Jung Lin. "How Does Small-Sized Firm Utilize Its Limited Resource to Develop Priority Competence." *Quest Journals Journal of Research in Humanities and Social Science*, vol. 08(12), 2020, pp. 18-27.