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Success and Challenges of a Korean Hidden Champion: Dynamic Capabilities Perspective

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Abstract
This study analyzed the relationship between dynamic capabilities and continuous competitive advantage of JVM, a small and medium-sized enterprise (SME) in the Korean ATDPS industry. The major findings are as follows: first is the capability to detect new opportunities. Second, aggressive investments could develop the capability to capture opportunities, which contributes to securing competitive advantage. Third, restructuring capabilities contribute to retain ability of firms.

Keywords: *Dynamic capability, competitive advantage, hidden champion, dynamic environment, sustainable competitive advantage*

1. Introduction

As technological changes accelerate with globalization, the business environment becomes subject to extreme uncertainty (Teece, 2007). As this uncertainty is exacerbated, firms face new strategic problems, which require new strategic thinking and action. On the other hand, firms continuing with old strategies in new business environments are unable to adjust to environmental changes, losing their competitive advantage, and collapsing (Lee, Kim, and Kim, 2015).

The fundamental task in strategic business research is to explain how firms achieve and maintain competitive advantage. However, existing theories of strategy (e.g., positioning approach, resource-based view) are insufficient for explaining the competitive advantage of firms in a rapidly changing and volatile environment. However, the dynamic capabilities perspective explains competitive advantages of firms in dynamic environments. Therefore, the dynamic capabilities perspective discusses the concept from various perspectives of strategy, innovation, deduction, and maintaining competitive advantage.

The most general definition of dynamic capability is the "capabilities of firms of being able to integrate, build and reconfigure internal and external resources of firms to cope against dynamic environments" (Teece, Pisano, and Shuen, 1997), although research has considered various perspectives. However, there are fewer case studies and empirical studies than theoretical discussions of the concept and importance of dynamic capability (e.g. Eisenhardt and Martin, 2000; Teece et al., 1997; Teece, 2007, 2014; Winter, 2003). This is because the abstract and multi-dimensional characteristic of dynamic capability makes it difficult to utilize objective material. Some researchers admit that empirical studies do not properly reflect the characteristics of dynamic capability. However, the framework of dynamic capability has significance in explaining the source of sustainable competitive advantage of firms and their success or failure in dynamic environments. Therefore, this study aims to analyze JVM's case to understand the dynamic capabilities of a dynamic business environment.

The purpose of this study is to explain the process of acquiring and maintaining competitive advantage in dynamic environments, based on a case study of JVM. The research contributions anticipated are as follows. First, this study provides insight into how firms create and maintain competitive advantage in rapidly changing environments through an intensive case study. Prior studies on dynamic capabilities focus on operationalization and measuring dynamic capabilities through theoretical discussions; however, this has empirical limitations due to the comprehensiveness and abstractness of dynamic capabilities (Kim and Huh, 2016). Therefore, this study attempts to understand dynamic capabilities based on the three lower capabilities of dynamic capability and microfoundations, suggested by Teece (2007). Research from practical perspectives provides implications on acquiring and retaining competitive advantages for SMEs in a rapidly changing environment.

This study has the following structure. First, it summarizes the pharmacy automation industry and the success of JVM. Second, it examines the theoretical background of the dynamic capability perspective and uses the case analysis frame to analyze JVM's case, deducting implications on the creation and maintenance of competitive advantage. This study asks the

following research question. How do the dynamic capabilities of a firm contribute to creation and maintenance of sustained competitive advantage?

1.1. Theoretical Background

Porter (1980) insisted that competitive advantage could be achieved through unique positioning and defense in the market, suggesting the positioning approach. In this strategic paradigm, competitive advantage is produced by unique and valuable strategic positions with a close integrated system (Eisenhardt and Sull, 2001). On the other hand, the resource based-view notes that securing a sustainable position is difficult, as the positioning perspective is based on the activities of firms, and competing firms copy positions. Furthermore, the resource based-view insists that competitive advantage could be achieved through resources and competences owned by the corporation, which are unique, valuable, difficult to imitate, and difficult to replace (Barney, 1991). However, the traditionally recognized strategic paradigms, including the positioning and resource based-perspectives are showing their limitations in a rapidly changing environment. In the modern business environment, in which customers have various desires and where change occurs frequently, it is difficult to change strategic positioning. The resources of firms that serve as the source of competitive advantage are susceptible to inertia rather than competitive advantage in a changing environment (Lee, Kim, and Kim, 2015). Therefore, new strategic paradigms are necessary in a rapidly changing business environment, which gave rise to the paradigm of dynamic capabilities.

Capability	Definition	Microfoundations
Sensing	Firm's ability to sense and shape opportunities and threats	Entrepreneurship, organizational process, decentralization of organizational structure
Seizing	Firm's ability to capture opportunities	Selecting product architectures and business models, enterprise boundaries, managing complements and platform
Reconfiguration	Firm's ability to reconfigure and re-combine assets (intangible and tangible)	Achieving decentralization, near decomposability, managing cospecialization, learning, knowledge management, and corporate governance

Table 1: Dynamic Capabilities and Microfoundations
** Adapted from Teece, D. J. (2007), Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance, Strategic Management Journal, 28(13), 1319-1350*

Teece et al. (1997) emphasize the importance of dynamic capabilities in a rapidly changing environment and define dynamic capabilities as the ability of firms to integrate, build, and reconfigure external and internal resources and competencies to cope against the changing environment. Helfat (1997) defined dynamic capability as "changing the resources or knowledge of the corporation to cope against rapid environmental changes," and Duet et al. (1999) viewed dynamic capabilities as not only organizational resources but also organizational capabilities, as a compound asset structure based on path dependence. On the other hand, Eisenhardt and Martin (2000) defined dynamic capability as the process of resource integration, positioning, acquisition, and distribution to cope with environmental changes or to lead environmental changes. Zahra et al. (2006) noted that there are redundancies in the definitions of dynamic capabilities, which creates ambiguity because it lacks integrity. To this, Teece (2007, 2014) suggested a new theoretical framework of dynamic capabilities. Specifically, Teece (2007) categorized and suggested microfoundations of dynamic capabilities, as those able to detect and form opportunities and threats, seizing opportunities to combine, protect, and restructure tangible and intangible assets. In addition, the framework of dynamic capabilities was limited to explaining the competitive advantage at the firm level. The definition of dynamic capabilities suggested by Teece (2007) is the most advanced definition, which is the definition adopted in this study.

2. Research Method

This study was based on a qualitative, single case study. Case study methods are categorized into single case studies and multiple case studies, and in a longitudinal case study, a single case study is the more appropriate choice (Yin, 2014). Because this study investigates how a corporation was able to create and maintain continuous competitive advantage and not just in one instance, it chooses the single case study method. However, Yin (2014) stated that the most important aspect of a case study is securing various analysis materials.

2.1. Case Selection and Data Collection

The research subject is JVM, a company in the pharmacy automation industry. JVM is a Korean SME established in 1978 and started as a company producing manual drug packaging machinery. In 1996, converting to a legal corporate, it began producing Automatic Tablet Distributing and Packing System (ATDPS), and venturing into the global market, as it acquired an ATDPS patent in the United States in 2002.

In 2013, JVM achieved a market share of 75% in Europe and 71% in the United States (JVM annual report, 2016), and became number one in the primary Korean market, US market, and European market, except the Japanese market. This is significant as JVM achieved success as a second mover, competing with existing dominant firms. To be successful as a second mover, a company must utilize both implicit and technical knowledge (Mathews, 2002). JVM underwent high degrees of R&D investment to develop proprietary technology and successfully managed to breach the patent barrier. Furthermore, JVM is continuously improving core factors and parts of existing products as per market demands; however, it attempted changes for differentiated product production. These efforts enabled JVM to establish its position in the global market and it is now considered a hidden champion from Korea.

JVM is a KOSDAQ listed corporation; therefore, access to public announcement materials is easy, and with increasing interest in global SMEs, there are many related news articles and literature. We collected data from three sources. First, we acquired annual reports. Second, we collected information from the firm's website and Internet search. Third, we conducted themed interviews on dynamic capabilities with managers in JVM.

2.2. Outline of the ATDPS Industry

The main customer of the pharmacy automation system is the pharmacist. Pharmacists work in hospitals and retail pharmacies, directing the overall process of drug dosage and consultation. The main tasks of pharmacists are calculating pills, packaging drugs, measuring and mixing of powdered or liquid drugs, data management of patients, and inventory management. These tasks are rather dull compared to their professional education. Especially, the separation of prescribing and dispensing drugs has simplified the job of a doctor; however, fatigue from simple labor makes it more likely that pharmacists will commit mistakes in dispensing drugs (Bepko, Moore, and Coleman, 2009; James et al., 2013). This is a serious potential risk to hospitals, pharmacies, and patients, and the pharmacy automation industry developed to avoid such latent risks (Silverstein, 2010.

In addition, as interest in health care surged with increasing numbers of the elderly, the medical service market is experiencing steady growth. The pharmacy automation industry is an infrastructure industry forming the basis of the pharmaceutical market and it is anticipated that the industry will grow with the pharmaceutical market. In addition, as demands in multiple dosages increase, the efficiency and effectiveness of prescription dispensing through bottles or blisters decline in European and North American markets, and the growth of pouch dispensing is anticipated to be high.

2.3. Data Analysis

Our data analysis followed the general guideline from Yin (2014). The purpose of data analysis was to explain sustainable competitive advantage by understanding dynamic capabilities. Hence, we began our analysis by finding core categories that could explain the observed phenomenon. First, we studied JVM's strategies, organizational structure, existing products, and R&D processes through the firm's web site and interviews. Then, we analyzed the data using the dynamic capabilities framework (Teece, 2007). We classified each data according to the sub-capability of dynamic capabilities. Finally, we analyzed data according to the microfoundations of each capability.

3. Results

Through a single case study, this study analyzes how firms achieve sustained competitive advantage in a dynamic environment. Based upon Teece's classification of dynamic capabilities (2007, 2014), we analyzed the dynamic capabilities of JVM in terms of sensing, seizing, and reconfiguring capacities.

3.1. Sensing Opportunities and Threats

Sensing capabilities can be defined as a firm's abilities to sense and shape opportunities and threats (Teece, 2007). With the enforcement of Good Manufacturing Practice (GMP) and the KFDA joining the Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme, the demand for the development of drug management increased (Kim and Kwon 2013). This influenced not only pharmaceutical companies but also pharmacies and hospitals. Responding to these demands, JVM launched INTIPharm, an electronic drug management system. The launch enabled JVM to achieve sales of 90 billion won in 2016 and record higher profits than average in the medical machinery industry (JVM Business Report, 2016). The launch of INTIPharm is significant because it integrates the top management team from the perspective of dynamic capabilities, pioneering the drug management system market.

JVM prioritizes customer satisfaction with the system and service and reflects the customer's voice in product development based on its philosophy of customer-oriented management (Kim and Kim, 2015). The core of such an operating system is coping with customer demands as quickly as possible, which is achieved through market research, monitoring and identifying customer demand, and commercializing. From the technological perspective, JVM performed continuous R&D for fast commercialization and meeting demand. JVM's research institute manages its R&D, which is a functional research and development organization. The research planning room within the research institute plans new products through market research (hardware and software). Although the R&D headquarters participates in the development of new products as per its requirements, its general tasks focus on enhancing existing products and technological management (JVM Business Report 2016).

The market and technological information produced from these activities enable deducting significant conclusions by filtering and integrating TMT (Teece, 2007). Lee (2009) deducted the success types of Korean SMEs. In his research, JVM is a type of corporation that starts a business based on technological abilities and ideas and develops learning abilities based on enterprising decision making. In other words, JVM's final decision-making lies in the hands of its CEO.

In summary, JVM identifies market demand based on continuous consumer demand research and market research with an internal research and development process to cope with market demand. The CEO integrates the knowledge created through this process into a new project. We may include INTIPharm here, where the firm sensed new opportunities in the dynamic environment to grow further.

3.2. Seizing Opportunities

Seizing capabilities can be defined as the firm's abilities to seize and exploit opportunities (Teece, 2007). In 1996, JVM discovered the possibility of a new ATDPS project. At that time, the ATDPS market was dominated by Japanese firms. Korean hospitals and pharmacy consumers were unable to customize the system according to their work environment because they used a standard product, regardless of scope or environment and faced difficulties in receiving repair services and other advanced services. However, the ATDPS market was a high technology-intensive one, with a high patent barrier, which made it difficult for new firms to enter the market. JVM, which only produced half-automated packaging machinery, was not an exception either. However, JVM was able to seize the opportunity in the domestic market, securing exclusive technology to produce drug dispensing automation machinery through aggressive investments, and achieving a unique position in the domestic market.

Entering the global market in 1999, JVM had to decide how it was going to compete against existing firms and create profit. From the perspective of corporate and product awareness, it was impossible to win against Japanese firms without differentiated products and profit structure. JVM entered the maintenance repair and operating (MRO) business to provide services differentiated from its competitors and developed an aftermarket. Consequently, JVM was able to become a global SME securing the highest market share in the US market, European market, and Korean market, but not in the Japanese market.

In sum, JVM was able to secure technology through aggressive investments, enter the market, and compete with companies dominating the market. It created an after-market to develop a profit structure and provided differentiated value for success.

3.3. Managing Threats and Reconfiguration

Reconfiguration can be defined as a firm's abilities to recombine and reconfigure assets and organizational structures. Despite its JVM outstanding achievements, the market demand and related laws in the drug dispense automation system market were continuously changing. JVM had to enhance the stability and efficiency of its core products continuously (Kim and Shin, 2015). This included linking existing components in new methods through architecture innovation, requiring the restructuring of the system (Henderson and Clark, 1990).

JVM launched products that could be linked with drug dispense automation machinery to secure a sustainable competitive advantage. A known example is VIZEN. VIZEN is a machine that enables the complete automation of prescription and inspection by synchronizing with the drug dispense automation machinery. This machinery enhances stability by filtering errors that may occur due to drug dispense automation machinery. In addition, WIZER is a system for providing drugs that have been inspected to patients at appropriate times to provide more value, maintaining a competitive position in the market.

JVM shows high dependence on technological competencies, which requires enhancing the research environment for maintenance and development. Therefore, JVM transferred the lagging sales sector to a company specializing in pharmaceutical sales in 2016, and increased investments in technological development. Furthermore, to secure a free research environment, the research institute promotes autonomous research projects through separation of power.

In sum, JVM is making substantial efforts to reconfigure its existing capabilities. Specifically, JVM is creating co-specialized assets that will grow with core products in the linkage and attempting to separate power and aggressive support to enforce its technological capabilities.

Capability	Characteristics	Capabilities of JVM
Sensing	Quick response to demand change, role of managers	Create a new market based on changing demand
Seizing	Large-scale investment, create new profit structure	Large investments in acquiring technology, provide differentiated services, and create follow-up markets
Reconfiguration	Cospecialized asset, decentralize and reinforce R&D.	Building a cospecialized asset and increased support for the R&D sector

Table 2: Dynamic Capabilities of JVM

4. Discussion and Conclusions

This study sought to investigate the characteristics of firms achieving sustained competitive advantages in volatile business environments. Globalization and technological advances have intensified changes in the business environment, making it more difficult for firms to secure sustainable competitive advantages. In this environment, dynamic capabilities become much more important. This is because dynamic capabilities contribute to discovering opportunities and threats through environmental changes, integrate, and adjust them. Therefore, dynamic capabilities contribute to securing and maintaining the competitive advantages of firms (Teece et al., 1997).

Therefore, this study examined the factors enabling continuous competitive advantage of firms as dynamic capabilities of firms, and conducted a case analysis of JVM, which has secured a successful position in the medical machinery industry using the lower concepts of dynamic capabilities, including sensing opportunities, seizing opportunities, and reconfiguration. <Table 2> details how JVM was able to secure a sustainable competitive advantage in a dynamic environment based on the dynamic capabilities framework. The characteristics of JVM viewed through the dynamic capabilities framework are as follows.

First, JVM secured a dominant position in the drug dispensing automation machinery market as a second mover. The pharmacy and hospital automation industry are a promising one because of the separation of drug prescription and dispensing, and because it has reduced the possibility of medical malpractice. Japanese firms created the market by sensing this opportunity; however, there were problems of usability and optimization in the Korean market. JVM spotted this opportunity and was able to expand its domestic market rapidly using high technology and providing differentiated services. Based on the technology and expertise acquired in the process, JVM successfully entered the global market.

Second, JVM attempted reconfiguration and changing resources to survive in a changing environment. The process could be achieved through the creation of a joint specialization asset. Especially, stability and accuracy are very important factors in the drug dispensing automation machinery. Providing products, inspecting, and complementing them increased the value of the drug dispensing automation machinery.

Third, demands for the new system increased due to increase in demand of the overall process from medicine manufacturing to drug dosage. JVM was sensed this opportunity through persistent market research and monitoring and developed a managerial system market of hospitals and pharmacies through aggressive investments. This study concludes that JVM was able to grow through its capability of seizing opportunities and reconfiguration and could secure new growth power by sensing opportunities. <Figure 1> shows that the relationship between JVM's dynamic capabilities and a sustained competitive advantage.

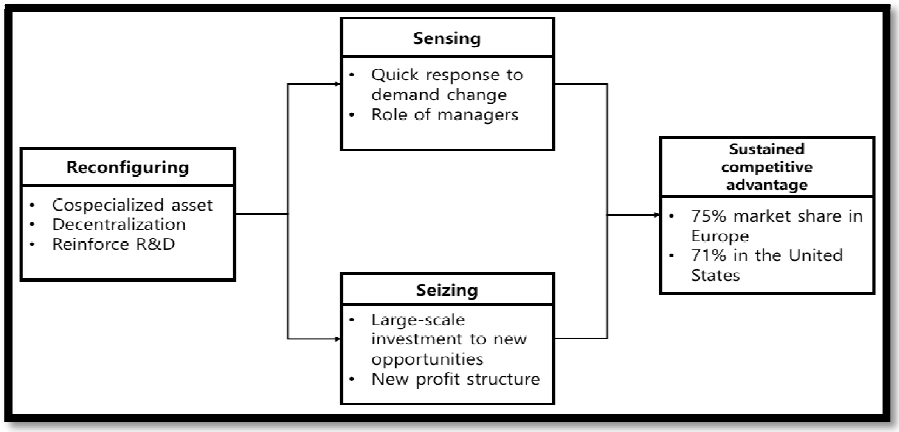

Figure 1: JVM's Dynamic Capabilities and Sustained Competitive Advantage

The results of this study provide the following theoretical and practical implications.

First, this study explained the relationship between dynamic capability and continuous competitive advantage in dynamic environments through a case study. In a rapidly changing environment, dynamic capabilities are admitted their importance through in-depth theoretical discussions (e.g. Eisenhardt and Martin, 2000; Teece et al., 1997; Teece, 2007, 2014; Winter, 2003; Zollo and Winter, 2002). Despite the theoretical discussion, practical research has limitations due to the ambiguousness of dynamic capabilities. This study is significant because it examines the relationship between dynamic capabilities and continuous competitive advantages through a case study.

Second, case studies on dynamic capabilities were before a clear definition of the concept of dynamic capabilities or are unable to explain the lower concepts of dynamic capabilities (e.g. Danneels, 2010; Sawers et al., 2008; Lee and Kwon, 2006). This research utilized the framework of dynamic capabilities suggested by Teece (2007, 2014), which is the most generally accepted framework of dynamic capabilities.

Despite the aforementioned implications, this study has the following limitations. First, this study chose a single case study method. The single case study method could be justified if the case has a longitudinal characteristic and could be appropriate for explaining the theory under scrutiny (Yin, 2014). JVM's case satisfies the above conditions but has clear

generalizability limitation. Therefore, the relationship between dynamic capabilities and continuous competitive advantage must be addressed through multiple case studies. Second, the study findings contribute to the understanding of dynamic capabilities. However, JVM is a Korean hidden champion. Usually, hidden champions have unique elements such as entrepreneurship. Despite in-depth case studies, the characteristics of a hidden champion cannot be ignored.

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