

Knowledge-driven Dynamic Capability and Organizational Alignment: A Revelatory Historical Case

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The current business environment has been characterized as less munificent, highly uncertain and constantly evolving. In this environment, the company with dynamic capability is reported to be more successful than others in building competitive advantage. Dynamic capability focuses on the link between a dynamically changing environment, strategic agility, architectural reconfiguration, and value creation. Being characterized to be flexible and adaptive to market circumstance changes, an organization with dynamic capability is described to have high resource fluidity, which represents business process, resource allocation, human resource management and incentives that make business transformation faster and easier. Successful redeployment of the resources for dynamic adaptation requires organizational forms and reward systems to be well aligned with firm's technological infrastructures and business process. The alignment is considered to be an executive level commitment.

Building dynamic capability is knowledge driven; relying on new knowledge to reconfigure firm's resources. Past studies established the link between the effective execution of a knowledge-focused strategy and relevant setting of architectural elements such as human resources, structure, process and information systems. They do not, however, describe in detail the underlying processes by which architectural elements are adjusted in coordinated manners to build knowledge-driven dynamic capability. In fact, understandings of these processes are one of the top issues in IT management. This study analyzed how a Korean corporation with a knowledge-focused strategy aligned its architectural elements to develop the dynamic capability and thus create value in the dynamically changing markets. When the Korean economy was in crisis, the company implemented a knowledge-focused strategy, restructured the organization's architecture by which human and knowledge resources are identified, structured, integrated and coordinated to identify and seize market opportunity. Specifically, the following architectural elements were reconfigured: human resource, decision rights, reward and evaluation systems, process, and IT infrastructure. As indicated by sales growth, the reconfiguration helped the company create value under an extremely turbulent environment.

According to Ancona *et al.* (2001), depending on the types of lenses the organization uses, different types

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of architecture will emerge. For example, if an organization uses political lenses focusing on power, influence, and conflict, the architecture that leverage power and negotiate across multiple interest groups would emerge. Similarly, if an organization uses economic lenses focusing on the rational behavior of organizational actors making choices based on the costs and benefits of action, organizational architecture should be designed to motivate and provide incentives for the actors (Smith, 2001). Compared to this view, information processing perspectives consider architecture to be designed to maximize the capacity of information processing by the actors. Using knowledge lenses, the company studied in this research established architectural elements in a manner that allows the firm to effectively structure knowledge resources to form dynamic capability. This study is revelatory single case with a historic perspective. As a result of this study, a set of propositions and a framework are derived, which can be used for architectural alignment.

Keywords : Dynamic Capability, Organizational Architecture, Knowledge-focused Strategy

I . Introduction

In the highly dynamic environment where market boundaries are blurred, successful business models are unclear, and market players are ambiguous and shifting, it is essential for firms to develop the dynamic capability-an ability to achieve new forms of competitive advantages to adapt to the changing business environment [Sirmon *et al.*, 2007; Eisenhardt and Martin, 2000; Teece *et al.*, 1997]. Dynamic capability is characterized to be “open to new evidence, always ready to reassess past choices and change direction” [p. 95, Doz and Kosonen, 2008]. Often called as organizational agility [Seo and La Paz, 2008], the dynamic capability is knowledge-driven. Dynamic capability relies on analyzing existing knowledge and identifying new knowledge by which the firm adjusts and reconfigures their resources to address a dynamically changing environment [Wang and Ahmed, 2007; Eisenhardt and Martin, 2000; Sull, 1999a, 1999b].

Over the last decade or so, a solid link has

been documented between the effective implementation of a knowledge-focused strategy and an appropriate setting of architectural elements-organizational forms, reward systems, process and information technology. In relation to organizational forms and reward systems, creating cross-functional teams to facilitate knowledge sharing [Nonaka and Konno, 1998; O'Dell and Grayson, 1998; Goffee and Jones, 1996]; and developing incentives for creative concepts and projects [Sirmon *et al.*, 2007; Davenport. 2000; Pfeffer and Sutton, 2000; Kelloway and Barling, 2000; Stewart, 1998] are reported to be associated with a knowledge-focused strategy. Regarding process and information technology, implementing a coordination process to offer unique and innovative services [El Sawy *et al.*, 1999; Grant, 1996; Spender, 1996; Teece, 1996]; and constructing a new technological infrastructure to facilitate the coordination [Gold *et al.*, 2001; Davenport and Prusak, 2000] are proved to be effective.

Previous studies established the fact that the effective execution of a knowledge-focused stra-

tegy involves relevant setting of architectural elements. They do not, however, describe in detail the underlying processes by which architectural elements are manipulated or adjusted in consistent and coordinated manners to build knowledge-driven dynamic capability. Although understanding of these processes is essential to many researchers and practitioners in the field, the information system research literature contains very few examples of this type.

Traditionally, the design of organizational forms and reward systems are considered to be a domain of strategists, whereas the design of the process and technological infrastructures are that of the technologists. The “mind gap” between strategists and technologists [Pepper and Ward, 1996] has long been an issue in IS research and is considered to be a major factor for misalignments between IT and business. Still, how well IT is aligned with business goals remains one of the top issues in IT management [Luftman *et al.*, 2007; Huang and Hu, 2007]. In the Spring 2002 issue of Sloan Management Review, Sauer and Willcocks [2002] argued that “many companies wrongly assumed that strategists and technologists would talk to one another or that one side, typically IT, would address the alignment of business needs and technology support [p. 42].” Traditionally, the CEO assumes responsibility for ensuring the fit between an organizational architecture and firm’s strategic direction [Nadler and Gerstein, 1992]. As indicated by Sauer and Willcocks [2002], while some CEOs have the knowledge and capability to be the organizational architect, many simply do not. In the latter case, they called for a creation of a separate position (or role) named ‘organizational architect’ to en-

sure the fit, which indicates the importance of the architectural alignment.

This study investigates how a corporation developed knowledge-driven dynamic capability through coordinating the organization’s architectural elements such as organizational forms, reward systems, process and information technology. In particular, this study was designed to address the following questions:

- what architectural elements become important to look into to develop the knowledge-driven dynamic capability?
- what has been performed in relation to the setting and coordinating of the architectural elements?

This is a revelatory, single case with a historical perspective. A revelatory case in a single-case format is appropriate for researching the complexity of these phenomena, where little or no previous research exists [Yin, 1994]. Since organizational architecture is a product of the environment, the agent’s (e.g. CEO) decisions and technological choices made in the past [Fredrickson, 1986, Kieser, 1994], the architectural alignment process can best be understood by taking historical approach. Further, the effects of architectural transformation on the innovative output and value-creation can best be understood from the historical and interpretive analyses of events and actions taken by one or more agents operating within socio-economic environments [Mason *et al.*, 1997; Zahra and George, 2002]. History in general provides high valued knowledge to decision makers, which can be used effectively by decision makers in different times [Neustadt and May, 1986]. Results of this study provide an

organizational architect with guidelines and a framework for designing an organization, particularly to maximize its ability to leverage knowledge.

According to Eisenhardt [1989], a priori specification of constructs based on extant literature assists in designing case research and to link the collected data to the questions of a study [Eisenhardt, 1989]. Based on previous research on organizational theory and strategic alignment, the architectural dimensions that must be aligned with the corporate strategy were identified. Using the architectural dimensions, a case study on the Trading Group of S Corporation is performed. The case was selected from an initial pool of 5 successful knowledge management cases identified through literature reviews. The case is chosen based on theoretical sampling [Glaser and Strauss, 1967; Eisenhardt, 1991; Lipset *et al.*, 1956]. The

case involved major architectural transformation and technological implementation, which matches with the objective of this study. The case data were collected from various sources including interviews, corporation publications, autobiographies of CEO, project documents and various trade publications. In this study, using a single historical case, general propositions will be generated inductively. The following table demonstrates the design for this study, comparing it to the recommendations by Eisenhardt [1989].

Although case research has disadvantage of bringing systematic rigor, this research used several tactics to improve methodological rigor. To improve construct validity, potentially important constructs were identified from organizational theory and strategic alignment; and multiple sources of evidence were used to build construct measures [Yin, 1994; Eisenhardt,

<Table 2> Research Design

Eisenhardt's step [1989]	Study design of this research
1. Definition of research question	Two research questions were defined
2. A priori specification of constructs.	Potentially important constructs were identified from organizational theory and strategic alignment. These constructs were explicitly measured during interviews and review of documents.
3. Selection of cases	Selected a case from an initial pool of 5 cases.
4. Multiple data collection methods.	Interviews, corporation publications, autobiographies of CEO, project documents and various trade publications are used to provide richness of the data and different perspectives.
5. Analyses of Data	Similar to approach taken by Quinn [1980], a teaching case for S Corporation was developed as a prelude to this theoretical study. This gives researcher a familiarity to the case being analyzed.
6. Generating propositions or hypotheses	General propositions are generated from the case.
7. Enfolding literature	Compared our theory with other management and IS literature

1989]. To improve reliability, efforts were made to elicit detailed research steps and to document research process [Yin, 1994].

II. Resource-Based View vs. Dynamic Capability

As process, architecture is defined as the activity of designing and constructing buildings and other physical structures. Physical structures range from landscape at the macro level to furniture at the micro level. The term, architecture is the most commonly used as a product of the activities described above. As documented, architecture is a structure on drawings to guide the construction activities. Thus, the definition of architecture encompasses process, product and documentation.

In organizational theory, the term organizational architecture is often used interchangeably with organizational structure, referring to (1) assignment of decision rights within the organization (2) reward system and (3) evaluation system [Smith, 2001; Hoogervorst, 2004; Hall, 1991; Sah and Stiglitz, 1986]. Proper arrangement of the decision-making authority with a commensurate reward/evaluation system affects the behavior of organizational actors and therefore affects organizational performance. In this regard, Nadler and Gerstein [1992] define organizational architecture as "the art of shaping behavior space to meet the needs and aspirations of a business," compared to the definition of architecture as "the art of shaping physical space to meet human needs and aspirations." This study considers the organizational process to be an architectural element. Process defines the manner in which tasks are

arranged and executed; and represents daily routine that employees follow. Accordingly, the process provides the behavior context for organizational actors and the proper arrangement and execution of the processes determine organizational performance.

On the other hand, resource-based view (RBV) considers the resources and capabilities to be architectural elements. In RBV, an organization is a collection of resources and capabilities. The firm's resources are considered to be building blocks to construct organizational capability¹⁾ and inimitable and non-substitutable resources and capabilities are believed to drive value creation and sustainability. The skills and knowledge of the human resource along with other complementary resources are linked together to form an organizational capability such as Information Services and Research and Development (R&D) [Byrd and Turner, 2000; Broadbent and Weill, 1997]. Firms then can possibly be viewed as a collection of such capabilities [Galunic and Eisenhardt, 2001].

Strategic management literature labels the process of forming capabilities through arrangement of an existing skill sets as 'bundling' [Sirmon *et al.*, 2007]. Capability can also be formed through the reconfiguration of a current resource bundle such as acquiring (recruiting) and developing (training) new resources; and divesting less valued resources [Uhlenbruck *et al.*, 2003; Sanchez, 1995]. New capabilities are

1) Capability is defined as "an ability to perform a coordinated tasks utilizing organizational resources [Helfat and Peteraf, 2003: 999]." The capabilities are ranged from less complicated to highly complicated capabilities [Brown and Eisenhard, 1999; Siggelkow, 2002].

also formed through the coordination of existing capabilities; or acquisition of new capabilities [Hitt *et al.*, 1998]. Thus, skills and capabilities can be viewed as architectural elements linked to form a large-scale architectural structure such as functional groups (e.g. marketing) and technical areas (e.g. printed circuit board assemble) [Galunic and Rodan, 1998]. Bundling, acquiring, developing, divesting and coordinating activities of constructing organizational capability are then considered to be activities for constructing the architectural structure.

While resource-based view (RBV) considers the resources and capabilities as the core of competitive advantages, highly dynamic environment challenged RBV as being static [Eisenhardt and Martin, 2000; Zahra and George, 2002]. Chandler's seminal work on Strategy and Structure [1962] explains well about the relationships between environments, strategy, architecture and business performance. He asserts that the organization's environment shapes strategy; and the firms whose structure matches their strategy become more effective than mismatched firms. Dynamic capability focuses on the link between a dynamically changing environment, strategic agility, architectural re-configuration, and value creation [Doz, and Kosonen, 2008; Zahra *et al.*, 2006]. An organization with dynamic capability is characterized to be flexible and adaptive to market circumstance changes.

Focusing on the ability to reconfigure resources and routines [Zahra *et al.*, 2006], an organization with dynamic capability is described to have high resource fluidity [Doz, and Kosonen, 2008]. High resource fluidity represents business process, resource allocation, hu-

man resource management and incentives that make business transformation faster and easier [Doz, and Kosonen, 2008]. Successful redeployment of the resources for dynamic adaptation requires organizational forms and reward systems to be well aligned with firm's technological infrastructures and business process [Rockart, 2004]. The alignment is considered to be an executive level commitment.

In building dynamic capability, knowledge management initiatives are considered to play an important role [Hung *et al.*, 2009]. The dynamic capability relies on a set of routines - perception, processing, responding, and aligning [Seo and La Paz, 2008]. While perception involves sensing changes in the environment by perceiving incoming information, processing involves filtering and analyzing perceived information. While responding is related to making decisions based on analysis results (i.e. knowledge), aligning is associated with re-configuration of organizational resources. The knowledge-driven dynamic capability involves not only knowledge creation routines but also exit routines that release resource combination that no longer provide competitive advantage [Sull, 1999a, 1999b].

Dynamic capability is also closely related with learning mechanisms: experience accumulation and knowledge articulation [Hung *et al.*, 2009; Zollo and Winter, 2002]. Experience accumulation generates experiential knowledge, which becomes the basis of enhanced recognition of the need for change. Knowledge articulation efforts improve understanding of changing action-performance links, and therefore result in adaptive adjustments to the existing routines [Zollo and Winter, 2002; Gavettia and Levin-

thal, 2000].

III. The Case of Trading Group

3.1 Knowledge-Focused Strategy

When a new CEO of the S Corporation took over in December 1996, the Korean economy was in crisis (note: businesses in Korea were sensing economic downturn, which was prelude of Korea being under IMF financial aid program December, 1997). In his inaugural speech, he said that “the Korean economy is in crisis. If this is a simple temporary recession, then we can hope that the crisis will be over within one or two years. However, this recession is not the case ... We need innovative thinking and tremendous efforts. We need paradigm shift [Hyun 2006: p. 306].” The CEO started management innovation and eliminated unprofitable business areas such as textiles and movies. As a result, the S Corporation was restructured from eight to four major business areas: trading, construction, housing development and retail. This structure continued until today. Among the four areas, the oldest is the Trading Group (66 years old) on which our case is focused. In the past, the Trading Group played an important role as an export intermediary of the S conglomerate, of which the S Corporation is a subsidiary.²⁾ The products manufactured by the member companies of the S conglomerate were exported through the Trading Group. As an intermediary, they provided matching, negotiating and mediating

services between sellers and buyers. However, the Internet, globalization, free trade, the Korean economic situation have threatened the Trading Group’s business model as an export agency for manufacturing firms.

The new CEO set the Trading Group’s vision to be the followings [Company Report-B, 1998]:

- Global organizer with the world class integrating capabilities
- Professional worldwide trading service for business partners

Combining functions of trading and project organizing services, the Trading Group tried to expand their business overseas into building refineries or chemical plants (especially less developed countries) beyond an exclusively trading-based business model [Hyun, 2006]. While successful tradings required knowledge on potential suppliers such as duration and costs of the manufacturing and risk factors associated with the suppliers, successful sales of the plant construction projects required knowledge on client nations such as economic development plan, plant development plan and risk factors associated with the nation. Trading Group needed the knowledge faster than any other competitors do.

CEO defines ‘knowledge’ and ‘speed’ as keys to value creation [Hyun, 2006: p. 313]. He was referring to outstanding global specialists, their knowledge and information infrastructure. The Trading Group needed global specialists who could use their global network for obtaining the necessary knowledge; and information infrastructure that empowers the specialists through knowledge accumulation and sharing.

2) Corporation background was obtained from the corporation reports.

Due to characteristics of the global business, the individual specialist who is the firm's core competency, are scattered around the world. Yet, knowledge sharing and collaboration among specialists in an efficient mode were vital in the environment where time-to-market was a key success factor. When a business opportunity arises, linking opportunities to the success of the business were dependent on (1) empowering the specialists with the knowledge on the country, corporation, personnel and associated risk factors; and (2) coordinating and linking the knowledge across global offices and support services in the headquarter (such as Legal and Contracting service, Financing service, Credit service, Logistic service and Inquiry arrangement service) for rapid, yet effective, decision [Company Report-A, 1998].

During 1996, before The CEO joined in the Trading Group in December, Knowledge Management was considered to be a tool for Innovation. However, it was not pursued because the timing was poor [Company Report-A, 1998]. In 1997, the firm's mid-term strategy formulation, the competitive conditions and economic crisis further demanded innovation through knowledge management (KM).

3.2 Organizational Transformation

3.2.1 Human Resource

The CEO had the view that no asset is as crucial or valuable as human capital. The CEO decided to establish human resource systems to recruit and develop creative, autonomous global specialists [Hyun, 2006]. The corporation has learned that creative employees have high-

er self-efficacy and are better in coping with complex and various task environments. The type of personnel they seek is as follows [Hyun, 2006]:

- adaptability to changing environment
- creativity to move beyond conventions and norms
- capability to think and make decisions autonomously
- accountability to stand on her or his initiative
- In-depth knowledge and constantly seeking professional development.

The CEO also decided to compose various teams with about 100 new managers. They had to acquire the knowledge, skills and spirits of venture companies in advanced countries. This attempt was an effort to increase the firms' tacit knowledge for venturing out new business areas when opportunities arose [Hyun, 2006]. The CEO encouraged employees to continuously learn and take initiatives to create value prior to their competitors.

In December 1997, Korea faced the IMF financial crisis. Due to the government's new economic policy under the IMF aid program, Korean companies had to bear 20% interest rates for bank loans. In April, 1998, the CEO was forced to lay off 40% of the S Corporation's employees and to accelerate management innovation [Hyun, 2006]. Throughout 1998, the Trading Group went through major transformation in organizational structure, compensation scheme and IT: (1) organizational structure was altered into business unit systems where each unit worked like a small enterprise with autonomy for budgeting, recruiting and

evaluation/promotion; and (2) information system called, "Knowledge Management System (KMS)" was implemented to empower business units (i.e., knowledge-based empowerment), promote collaboration among the specialists for new business opportunities, and escalate workflow efficiency and deal with completeness [Company Report-B, 1998].

3.2.2 Structure

Under the business units system, the Trading Group was composed of 40 units [Hankook Business Newspaper, 1998]. Each unit worked like an individual firm with autonomy for budgeting, recruiting and evaluation/promotion. Each unit had the authority to dispose of a certain portion of the unit's profit. Unprofitable units were closed. Compensation for the employees was affected by unit performance. Based on common tasks and shared goals, the unit-based structure generates a high degree of strategic focus and goal accomplishment. According to an interview,³⁾ "all the work in the Trading Group is performed by a unit-basis; once a unit is composed, delegation of a task to individual unit member is done right away; autonomy to manage the task is also given the individual member; and we, individuals are self-confident and highly motivated to get the job done."

3.3.3 Knowledge Management System

Knowledge Management Systems (KMS) were

introduced in December, 1998. The goals of KM can be elaborated as follows [Company Report-B, 1998]:

- Proactive collaboration for new business chance
- Escalate work flow efficiency
- Expert empowerment for risk management.

KMS was viewed as global collaboration platform connecting the global offices and the supporting services in the headquarter. The knowledge to be captured in KMS was categorized into Competitive Information and Expert Knowledge [Company Report-B, 1998]. Competitive Information (such as information on buyers/suppliers, Key person, products, projects, country region) was expected to capture new business chance, increase sales capability and improve risk management. Expert Knowledge (such as Credit and Legal, Finance, Insurance and Logistics knowledge) was expected to support the sales capability through collaboration and deal completeness. According to CIO (Chief Information Officer) of the Trading Group, the success of KMS depends on real-time access to client, supplier, item and people knowledge; risk factors by country and region; and legal and finance knowledge.⁴⁾

Since businesses and work activities in the Trading Group were performed by unit basis, KMS was also built around the unit's work process. According to the initial study of KM, employee's voluntary participation in KM was considered to be difficult due to work overload on employees. Therefore, KMS was developed

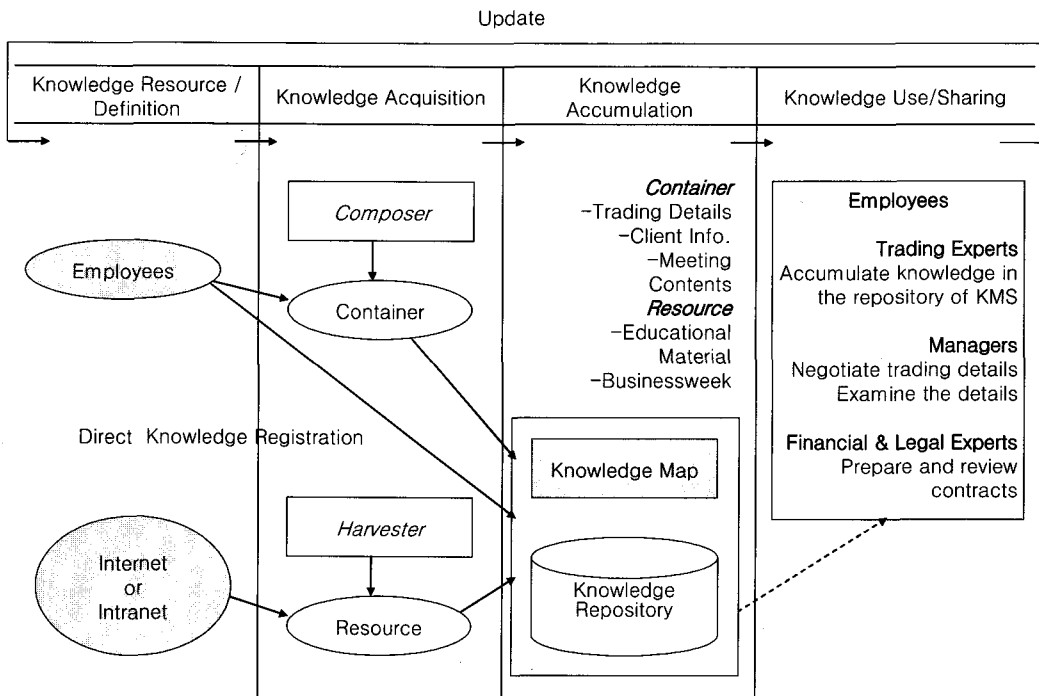
3) An employee who worked as a key man for Knowledge Management was interviewed.

4) <http://www.cio.seoul.kr/990415/main13.html>.

in a way that knowledge contents were combined with daily work activities. Built around the work process, the system expedited an accumulation of knowledge as well as a coordination of knowledge flow along the work process. Knowledge management process-(1) definition of knowledge resource, (2) knowledge acquisition, (3) knowledge accumulation, (4) knowledge utilization/share, and (5) knowledge update <Figure 1> was combined with a unit's daily work process so that the knowledge obtained during daily work were collected and shared in the course of the unit's work process. The system expedited an accumulation of knowledge as well as coordination of knowledge flow along the work process. Knowledge flowed within business units as

well as between business units and supporting services.

For the Trading Group, the knowledge sources included both internal sources (mainly unit members) and external sources. Before accumulating knowledge from the sources, the Trading Group had to create a container to hold the knowledge. While the container holding internal knowledge was called 'Container', the container holding external knowledge was called 'Resource.' While 'Container' was created by 'Composer' component of KMS, 'Resource' was created by 'Harvester' component of KMS. The knowledge of the trading experts was accumulated in Container. The contents of Container include know-how, trading details (such as trading results, trading items, respon-



<Figure 1> Knowledge Management Systems and Process (Adapted From Company Project Report)

sible traders and trading risks), business-partner knowledge (such as the favorite food of the client CEO) and meeting contents. The contents of Resource include educational material and trade journal articles.

KMS also provided a knowledge map according to the names of Container and Resource, keywords and subjects. The knowledge map provided the list indicating where to find knowledge in the repository. The names of Container and Resource usually reflect the names of business units. According to an interview, "each business unit deals with unique items, thus sharing knowledge across units was not likely and useful." Therefore, each knowledge container was more likely created on a unit basis and shared by unit members.

To accumulate knowledge in the repository, KMS provided two modes: (1) direct knowledge registration from employees; and (2) knowledge imported from external sources. The first mode was associated with the members registering knowledge in 'Container.' The knowledge stored in 'Container' includes trading details, client Information and meeting contents. The second mode was associated with importing knowledge into 'Resource' at regular intervals from various external sources on the Internet. The import was done by Harvest module of KMS. Using the various search tools of KMS, the employees search and use the knowledge in the repository. According to an interview, "a series of knowledge collected over a period of time especially about trading partners was found to be the most useful."

Using the workflow functions of KMS, knowledge was routed to the appropriate personnel. By this method, the accumulation and use of

knowledge were organized around the daily work process. KMS also allowed for the exchange of opinions on the usefulness of knowledge. This function permitted knowledge in the repository to be evaluated and upgraded.

3.3.4 Work Process

Previous work processes were altered around the new KM system [Kim, 2002]. In the previous process, the trading expert in the global office reported the trading details to the manager in the headquarters in the form of the paper document or by oral presentation. Under the new process, the trading details under negotiation were routed to the manager in real time by the workflow capability of KMS. Then, the manager examined the details, and a contract was prepared and reviewed by financial and legal experts of the supporting service.

For example, a manager of Trading Group was contacted by a potential buyer during his travel overseas.⁵⁾ The manager logged on to the KMS and found the knowledge on the potential buyer, which was recorded in another instance. The manager could also find knowledge on potential suppliers including the duration and cost of the manufacturing and risk factors associated with the supplier. Failed past projects associated with a specific supplier could provide valuable information regarding risk management [Company Report-C, 1999]. During his travel, the manager could write a sales proposal and the proposal were routed to financial and legal experts for review. The sales went through smoothly. According to a company re-

5) <http://www.cio.seoul.kr/990415/main13.html>.

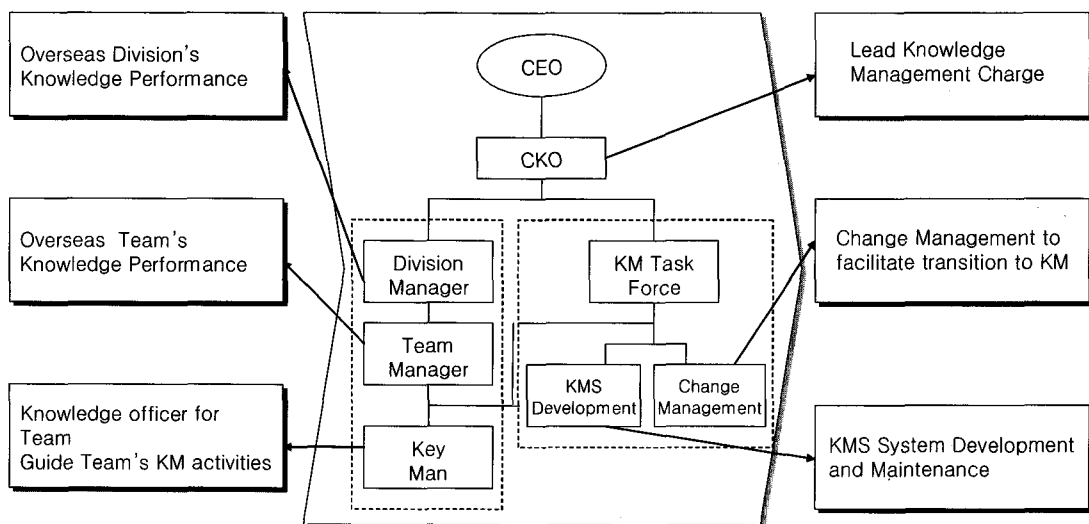
port [Company Report-C, 1999], real-time knowledge sharing among related employees increased the success rate of the project. The contents of the repository were analyzed to identify the reasons of failed projects, which provided valuable information regarding risk management [Company Report-C, 1999].

3.3.5 Knowledge Management Organization

The KM organization was also designed around the business unit. Trading experts in each unit were considered as key knowledge sources. In each unit, there was a 'key man' who played a role of 'Knowledge Officer' for the unit. The key man was the one who understood the knowledge map of the unit and guided KM activities of the unit <Figure 2>. The key man collected the opinions of unit members regarding KM and reported the collected opinions to the KM task force team of the enter-

prise. The Trading Group had a horizontal structure, which employed the task force team and project team when necessary. The KM task force identified and then promoted KM best practices, held regular meetings and brainstorming sessions with the key man, and developed incentive (mileage) and support for overseas offices. The KM project team was formed to carefully orchestrate the KM project. The role of the project team included benchmarking KM projects of other global companies and promoting and educating the employees on the KM system.

Regularly, the key man reported to the unit manager data concerning the status and progress of the units of KM. The unit manager played a role of knowledge sponsor. Responsible for managing KM activities within a unit, the unit manager utilized the report to oversee knowledge sharing and maintenance activities within the unit. The unit manager reported to the division manager regarding the KMS uti-



<Figure 2> Knowledge Management Organization (Adapted From Company Project Report)

lization of the unit. In return, the division manager reported to CEO. Knowledge sharing and utilization by the trade experts were considered to be 'appeal' to the unit manager, which was reflected in the performance evaluations of the individuals. The performance of each unit's KM activity was reflected in the unit evaluation. Linking the unit's KM performance to unit's overall performance evaluation re-enforced the strategic direction of the Trading Group that the unit's performance (P) is dependent on knowledge (K), and unit's survival (S) was dependent on the unit's performance: $K \rightarrow P$ and $P \rightarrow S$ [Maeil Business Newspaper, 1999].

According to an employee who was a member of a KM organization, "the Trading Group once attempted to share knowledge across divisions; however, the attempt resulted in failure; the reason was that business performance of each division was evaluated separately from other divisions; this resulted in each division protecting its knowledge from other divisions." He continued that "while work knowledge can not be shared across divisions, corporation policies and rules can be shared across divisions."

According to an interview, once useful knowledge was accumulated in the repository, delegation, autonomy and self-motivation of individual team members to get the job completed successfully were the major reasons for utilizing knowledge instead of the compensation of individuals for utilizing knowledge.

3.3.6 Results

KM in the Trading Group of the S Corporation is considered to be highly successful. Ac-

ording to the director of the Strategic Management Team, the knowledge utilization of the group was 10 times that of knowledge deposit to the repository of KMS (Knowledge Management Systems) [Kim, 2002]. Although other conditions than KMS may be attributed to the sales increase, their sales of 1.65 billion USD in 1998 had increased to 1.98 billion USD dollar in 1999, 2.5 billion dollar in 2000, which represents a 20% increase in 1999 (the following year of KMS implementation) and 26% increase in 2000 (Source: firm's financial Data).⁶⁾

IV. Case Findings

As a result of this study, 'Framework for Architectural Alignment' is suggested <Figure 3>. Each box in <Figure 3> is explained below in detail:

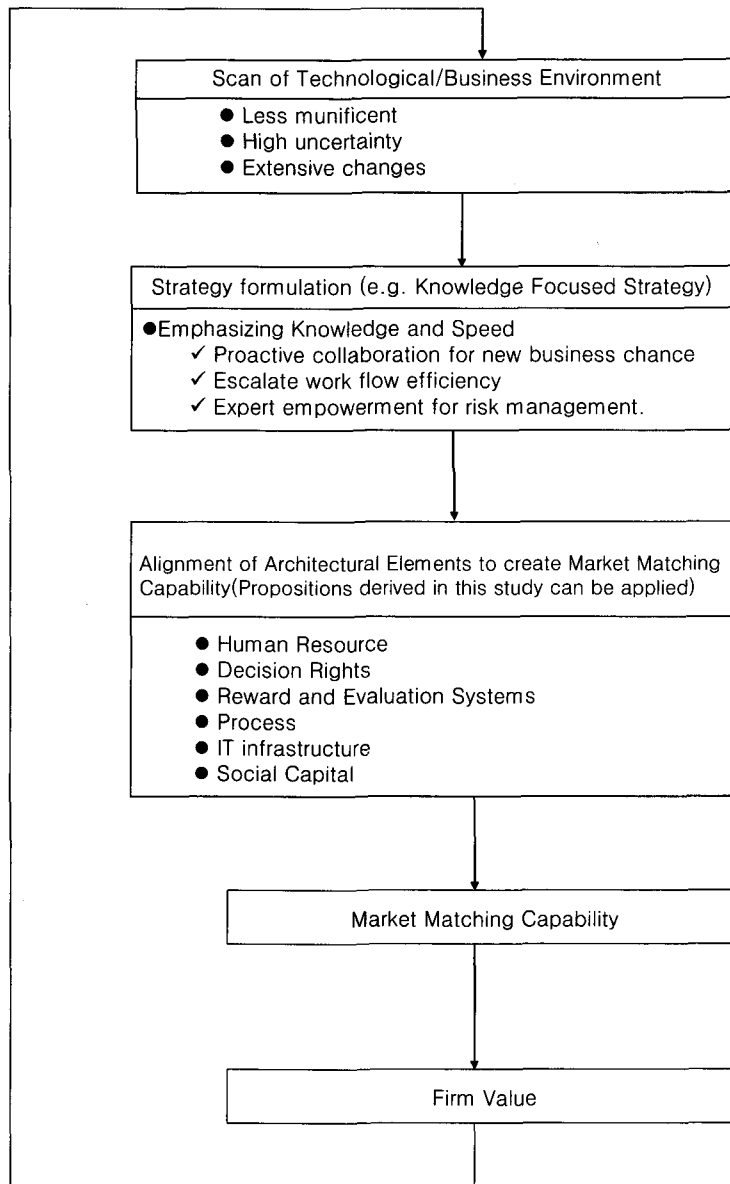
Scan of Technological/Business Environment This study found that the selection of emerging technology in 1996 is antecedent to strategy formulation in 1997. This is similar to Wheeler [2002] and differs from the view that strategy formulation is antecedent to IT choice [Sauer and Wilcocks, 2002]. In 1996, the Trading Group considered KM as a tool for innovation. In 1997, the year of forming the mid-term strategy, the Trading Group's strategy was formulated with an emphasis on knowledge and speed. As suggested in CEO's inaugural speech, the Korean economy was unpredictable and experience violent fluctuations, which is consistent with characteristics of a dynamic en-

6) Sales increase is the main focus of the top management and relevant indicator of knowledge management [Kerin *et al.*, 1990].

environment-less munificent, high uncertainty and extensive changes-as described in Miller and Shamsie [1996]'s article.

Strategy Formulation The Trading Group viewed that the success of the firm in the dy-

amic environment depend on identifying and seizing new market opportunity beyond trading of manufactured goods. In this study, the capability that identifies and seizes market opportunity is defined as market matching capa-



<Figure 3> Framework for Organizational Alignment

bility. To create market matching capability, the Trading Group's strategy was focused on knowledge and speed. When a business opportunity arises, linking opportunities to the success relied on knowledge empowerment of the global specialists; and knowledge sharing and proactive collaboration among specialists in timely manner; and risk management through knowledge empowerment.

Alignment of Architectural Elements to create Market Matching Capability The implementation of a knowledge focused strategy involved restructuring the organization architecture by which human and knowledge resources are identified, structured, integrated and coordinated to identify and seize market opportunity. Specifically, the following architectural elements were reconfigured to construct market matching capability: human resource, decision rights, reward and evaluation systems, process, and IT infrastructure.

In relation to reconfiguration of human resources, the Trading Group evaluated the current human resources and decided to divest less valued resources; and acquire and develop human resources of higher value as an effort to build market matching capability. Human resources are considered as key source of the organization's knowledge and the most important determinant for the organizational performance. Focusing on tacit knowledge, the Trading Group emphasized rigorous employee selection and development to have the best knowledge. Unprofitable business groups and human resources within the group were divested to focus on profitable businesses. Integrating and coordinating of highly capable and confident human resources helped to develop

market matching capability and create value. Value creation is defined as providing customer with a solution in advance to competitors and, thus creating wealth [Sirmon *et al.*, 2007]. For Trading Group, value creation involves the sales of trading goods and projects to customers in advance to competitors. The following proposition is derived in relation to human resource reconfiguration.

Proposition 1: Recruiting, internally developing and divesting human resources in a manner to increase a firm's potential to form market matching capability are necessary to create value in a dynamic environment.

In relation to the structure (decision rights, reward and evaluation system), the following proposition is derived:

Proposition 2: Setting organizational structure (decision rights, reward and evaluation system) in a manner that skills and capabilities are integrated and coordinated to form market matching capabilities is necessary in creating value in a dynamic environment.

The Trading Group's success is a result of knowledge integration and infusion across competency areas. For example, combining the Trading Group's project organizing capability with the Construction Group's capability allowed the Trading Group to win plant construction projects in the Middle East. The knowledge integration across competency areas was

possible due to the Trading Group's less routinized structure, namely the business unit system. Under the business unit system, existing skills and capabilities can be easily integrated into a business unit. When a business unit no longer creates business value, it can be easily eliminated.

Learning knowledge in other competency areas is more difficult than learning within-competency knowledge due to (1) the high absorptive capacity of employees toward within-competency knowledge [Cohen and Levinthal, 1990] and (2) the organizational routine hindering knowledge flow across competency areas [Nelson and Winter, 1982]. Yet, a novel capability is created through combining knowledge embedded within a competence area with knowledge in other competency areas [Galunic and Rodan, 1988; Hargadon and Sutton, 1997; Nonaka and Takeuchi, 1995]. Thus, it could be concluded that the Trading Group's less routinized structure called business unit system is more likely to combine knowledge across competencies and creation of novel capabilities than the traditional structure.

In relation to an IT platform and process, work flow efficiency and real-time knowledge sharing among employees further enhance the capabilities of the Trading Group to win projects. Knowledge accumulated in KMS assisted the business unit in analyzing the opportunities and associated risks; and increased a unit's potential to beat competitors. By linking the unit's KM performance to the unit's overall performance as well as individual performance, the employees were encouraged to share their knowledge.

Proposition 3: Developing a Knowledge Management System (KMS), redesigned work processes and routines for rewarding knowledge sharing in a manner to increase the firm's potential to form market matching capability, is necessary in creating value in a dynamic environment.

The results of this research indicate that proposed framework should include social capital as an architectural element to be aligned. Social capital is "the sum of actual and potential resources embedded with, available through and derived from the network of relationships possessed by a social unit" [Nahapiet and Ghoshal, 1998]. Shared meaning and trust are examples of social capital. A firm is viewed as a social community [Kogut and Zander, 1998]. Social capital is 'the collectively owned' resources for the social action [Bourdieu, 1986] and has an influence on the economic performance of the firm [Baker, 1990]. Several researchers consider social capital as an important building block to construct distinctive organizational capabilities, especially knowledge driven capabilities [Gold *et al.*, 2001; Doz and Kosonen, 2008]. Social capital has multiple dimensions-cognitive and relational.

Cognitive dimension refers to shared meaning and interpretations embedded in organizations [Nahapiet and Ghoshal, 1998; Conner and Prahalad, 1996; Grant, 1996; Kogut and Zander, 1996]. Meaningful communications about change initiatives require shared meanings among members [Nelson and Cooperider, 1996; Boland and Tenkasi, 1995]. The CEO of S Corporation tried to plant seeds of change by

composing teams of 100 new managers and had them to learn the knowledge, skills and spirits of venture companies in advanced countries. Rather than emphasizing narrow cognition of operational aspects, focus on this broadened cognition of new market opportunities fostered innovation in the Trading Group. Although the number of ventures launched and succeed are unknown, the ongoing dialogue around ventures could help to maintain change spirit throughout the company, foster experimental learning, explore new market opportunities and value creation.

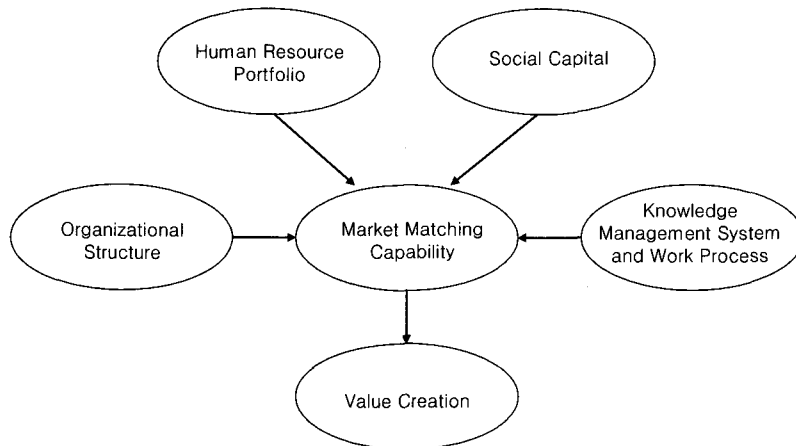
Relational dimension refers to those resources created and leveraged through relationships [Nahapiet and Ghoshal, 1998]. The relational dimension of social capital includes trust and norms. Trust in relations between the source and the recipient fosters the transfer of knowledge within organizations [Davenport, 2000]. Norms of cooperation can establish a strong foundation for knowledge exchange and creation; and encourage cooperative behavior, thereby facilitated the development of innovative organization [Fukuyama, 1995; Putnam, 1993]. Innovation diffusion research also suggests that innovation adoption is influenced by social norms [Taylor and Todd, 1995; Venkatesh, 2000]. The Trading group made various efforts to make proactive collaboration and knowledge sharing to be norm. For example, the Trading Group's vision is set to be global organizer with the world class integrating capabilities; one of the KM goals is proactive collaboration for new business change; and the Trading Group made knowledge sharing as 'appeal' to the boss. Norms demonstrate expectations about what behavior is appropriate

with a given group. In Hyun [2006], it is found that the CEO made tremendous efforts to have employees perceive innovative thinking and collaboration as normal and expected behavior. In relation to social capital, the following proposition is derived:

Proposition 4: Developing social capital in a manner to increase the firm's potential to form market matching capability, is necessary in creating value in a dynamic environment.

Market Matching Capability and Firm Value
 Once high valued knowledge is accumulated in the repository, delegation, autonomy and self-motivation of the individual unit members to get the job done are the major reasons for utilizing knowledge in KM system instead of compensation for individuals from utilizing knowledge. Through autonomous structure and profit management of the business unit system, each member of the unit is motivated to invest their knowledge for the common good of the corporation. Having highly capable and empowered unit members through recruiting, delegation, autonomy leads KM to be utilized. Broadened cognition of new market opportunities and norms of collaboration became a basis for knowledge exchange and creation. This indicates that architectural dimensions dealt in each proposition should be harmonized to ensure the successful development of market matching capability and thus, value creation <Figure 4>. The role of the organizational architect is to ensure that each element is well harmonized.

As shown in the example of 'Work Process'



<Figure 4> Dimensions of Dynamic Capability

section, KMS was intended to provide knowledge by which employees not only identify business opportunity but also detect business risk. To a certain extent, KMS and the business unit system together helped adjusting resources not only to seize the opportunities but also to exit from existing business due to high risks. This exemplifies the characteristics of dynamic capability.

Proposition 5: *To a certain extent, Knowledge-Focused Architecture facilitates forming a dynamic capability to continuously maintain fit with a dynamic environment.*

V. Conclusion

Because of the changing business environments, such as the advent of new technology, existing organizational architecture does not hold utility for value creation for a firm. As early as 1990s, the need of an organizational architect was called for to ensure the fit be-

tween an organizational architecture and firm's strategic direction [Nadler and Gerstein, 1992]. To date, however, MIS research has not sought to study the underlying processes by which architectural elements are adjusted to implement strategic IT-based innovations. This is because MIS studies have generally lacked an historical perspective to document the social and economic conditions of the innovation; actions and decisions of corporate leaders; and changes evolved around them. Using historical perspective, the contribution of this research is to help MIS researchers understand the underlying dynamics of architectural alignment to build Knowledge-driven dynamic capability and their effects on firm success. Practically, the contribution of this research is to provide an organizational architect with the framework and guidelines in describing how organizations can orchestrate disparate architectural elements to build Knowledge-driven dynamic capability.

Orchestrating the architectural elements is an art as well as a science. Jean Nouvel, the winner of 2008 Pritzker Architecture Prize (ar-

chitecture's Nobel), describes the distinctive look of L'Institut du Monde Arabe, his signature building, as a product of both a social and physical context in which the building is situated, a pattern of mechanical oculi that he used for panels and light that shed upon the interior of the building through the oculi [Churchill, 2008]. The architecture is an art as product as well as process, which gives originality and uniqueness to the style. Just like an architect of a building, an organizational architect creatively invents the organizational architecture by combining context, approach and materials such as technology or the skills of human resources. Depending on the context in which the firm operates, the approach that the firm takes, and the material that the firm possesses, a unique organizational architectural style should emerge. Just like art education can not help how to make a particular piece but

how to find their own style, general propositions derived inductively in this study can only guide the organization to find its own style. Yet, the architecture is a science in that the architect is based on management theories on how each architectural element is designed at the micro level, and on how the architectural elements can be put together at the macro level.

The limitation of this study is that the findings can not be extrapolated to all organizations due to the characteristics of the one case as well as characteristics of art aspect. For future studies, the usefulness of this framework across companies and different IS domains need to be tested to generate theory with rigor. According to Kieser [1994], theories can be generated in a constant dialogue with the historical data. Using multiple historical cases, theory that possibly contains causal mechanism can also be generated.

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