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Developing Strategic Information Systems at Business System transformation
-A Case Study of SEIREN Co., Ltd.-

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Abstract :

This paper analyzes product development and business growth as a result of changes in information systems (IS) during a period of business transformation. Since the 1990s, management of corporate IS being made by outsourcing has become a basic business strategy, against a backdrop of theoretical motivation explained by theory of core competence and transaction cost theory. Outsourcing service providers with technical expertise have continued to grow by enjoying economies of scale produced by replicability of IT related products.

However, existing theories that explain IS outsourcing might not be valid in the transition phase of business system (i.e., business model). Instead, we think that there is a possibility in insourcing management to create strategic information system and to achieve more flexible and effective business systems transition than outsourcing management.

The purpose of this research is to find clues that answer the question how these firms develop and maintain their IS that provide competitive advantages at business system transformation by case study. The exploratory case study shows the effectiveness of developing IS in-house. It indicates that (1) the innovative vision of top management advances accumulating business knowledge deeply and widely in organization, and (2) using accumulated knowledge and skills through insourcing management enables the firm to develop unique and effective information systems.

In the view of capability-based approach, we conclude that Insourcing (Not Outsourcing) IS development that includes “IS-extensibility” make the business system transformation more flexible and effective.

Keywords:

Business System Transformation, Information systems, Capability, Viscotecs, Competitive Advantage, insourcing, IS-extensibility

1. Introduction and Objectives

One of the critical issues of any corporation is how it continues to grow and perform successfully. Among stakeholders including customer, shareholders and employees even if they have different and sometimes opposing interests, a lasting positive performance is assumed as a common goal. Under the globalization of competition, ceaseless technological innovations and diversification of customers' needs, companies are forced to reconstruct their business system in order to survive and prosper.

For example, Japanese companies' production system have been transformed from "speculative development," in which product design and production volume are determined in advance, to "deferral development" a process implemented in the 1980s whereby the manufacturer adds production volume when necessary (Takashima 1994). Ogawa (2006) classifies this deferral development system into two further groups: deferral of production determination and deferral of design determination. Deferral related to production determination is an approach to postpone the production decision, i.e. as late as possible, bringing the timing close to customer's point-of-sales.

Instead of scheduled production, whereby products are processed in bulk and stocked awaiting orders, by estimating demand in advance, manufacturers minimize initial production volume and determine the volume of additional production by responding to observed sales. In a similar manner, deferral of design determination is used to delay final decision pertaining to product specification as close to the customers' point-of-purchase as possible. As a result, deferral development is more efficient than existing development systems in that it reduces losses either due to dead stock or depletion of stock (Ogawa 2006: 140).

The deferral development system is a significant outcome especially in markets where customers' needs are diverse and change rapidly such as with apparel market. In fact, SPA(Speciality-store/retailer of Private-label Apparel), that is, "fast fashion" retailers such as ZARA and H&M, have grown significantly in recent years. Traditionally, production processes of apparel companies takes about one year for entire process; from procurement of cloth, design, patterning, order entry, production and delivery. However, companies such as ZARA and H&M take only several weeks from the design process right through to display of finished product lines in their stores, allowing them to reduce losses through dead stocks as well as loss of earnings by running out of stock (Minami 2006). Given this perspective, the ultimate production system for a company which implements deferral development system seems to be mass customization: flexible production system created by information

technology that enables it to design and produce a wide variety of products in small quantities at lower cost, dependent on the needs of individual customers. In order to establish new deferred production system, it is necessary for a company to introduce IS to design, produce and transform the business system.

In this paper, we focus on the management of corporate IS in large companies during the period of business transformation. The purpose of this case study is to find clues that answer the question how these firms develop and maintain their IS which provide them with competitive advantages.

Information systems play a critical role in the overall structure of the business system. The transformation from one particular business system to another is caused by various factors such as globalization and diversification of business, changeover of business category, restructuring and corporate reengineering. In most cases, these transformations require and entail the review of existing IS. At the same time, a review of IS also influences business system. There is interrelated influence between information system and the business system (Inoue 1998).

2. Literature Review

One method that business undertakes in order to gain competitive advantage is to establish a review of IS. However, establishing a competitive advantage is not solely done by the introduction of new IS itself, although, in recent years, it is becoming more difficult to complete various business tasks without utilizing IS. For instance, the introduction and management of information system has flourished in human resource management and in accounting. In the same way, production planning and supply chain management also requires IS for controlling the flow of both information and goods. IS are necessary and commonplace, but, the question of whether information systems could be a source of competitive advantages or not remain inconclusive in existing literature.

On the one hand, some literature suggests that that even though it is a business requirement, information system are becoming a commodity without the rarity that is a condition of being a resource of competition advantage thereby diminishing its strategic value (Carr 2003, 2004, 2005, 2008) ³. If an information system really is not “Core Competence” (Prahalad and Hamel 1990) that is, if it does not help a company to achieve strategic advantages, but is just a commodity that is procurable on the market at a lower cost, companies would be best placed to out-source the task rather than to introduce the information system in-house. Indeed the

process of introducing IS needs specialized technological knowledge which includes examining and detailing the operations that's improved by IT, establishing a requirement definition, as well as the implementation of the system its design and development to its operation and maintenance. Therefore outsourcing all or some parts could be said to be more efficient rather than insourcing.

Since the 1990s, the effectiveness of outsourcing in order to enhance its core business has received significant attention (e.g., Quinn 1992). Kotabe and Helsen (2008) pointed out that the cutting costs and focus on core competencies, the use of special expertise and intention to expand sales and profits as the main reason why companies outsource, and that the same is true of IS outsourcing. They also note that especially in Japan by recession, corporate is forced to explore cost savings methods by IS outsourcing.

Also, King and Malhotra(2000) make specific references to particular functions within IS which tend to be outsourced. Akomode et al. (1998) describes this type of outsourcing as a basic strategy for developing IS for several reasons; cost reduction, inefficiency of developing IS within a company and a lack of technological ability. Since 1990s, information system departments in many Japanese firms have taken a less hands-on approach to IS preferring to out-source roles which includes planning, constructing, designing, developing, implementing and maintaining to outside specialized companies such as “service providers” like IBM, in whole or in part, otherwise sale the information system department or form a capital alliance with a specialized affiliate company.

Through various approaches a body of work pertaining to the outsourcing of IS has been established. While economic theories explain its efficiency in terms of scale economics and transaction costs, diversified procurement frameworks ranging from internalization, intermediated organization (pseudo-outsourcing) and internal market within the organization have been proposed (Yoshida, Yoda and Minami 2009).

In contrast, some literatures suggests that IS are strategically important for achieving a competitive advantage for the company (Yoda 2010). In an extensive literature review, Piccoli and Ives(2005) pointed out the existence of four barriers that serves as obstacles to replication; “IT resource barrier” including both assets and capabilities, “complementary resource barrier” including distribution channels and organizational structure, “IT project barrier” caused by rarity and complexity of technology and “preemption barrier” that consists of switching cost and relationship.

Because of these four barriers, IS are not replicable. Specifically, literature on Resources Based View (RVB) regard IS as important as they endow strategic resources when created

within a company. In other words, they regard IS not as commodities but as constituting “core competences” (Prahalad and Hamel 1990).

The background of this position is a perspective that knowledge created in organizational processes is an important resource for the company. Penrose (1959) who influenced the theory of Resource Based View, pointed out in her book *“The Theory of the Growth of the Firm”*, that knowledge accumulated in organizational processes is an important resource for the growth of the firm. That is, the process of business operation itself creates new knowledge as resource with which managerial services provide ideas to link the emerged knowledge with new production services. Penrose states that this mechanism is one reason why companies grow. Richardson (1972) added the concept of “capability” to Penrose’s idea of “managerial service” which makes use of resources. Research focusing on RBV has further developed this field.

Leonard-Barton (1992) also adopts a “knowledge based theory” and argues that core capability of a company is a set of knowledge that endows it with competitive advantages. According to Leonard-Barton, core capabilities are distributed along four dimensions: employees’ embodied “knowledge and skills” and “procedures and routines”, “technical systems” such as information system in which these knowledge and procedures are embedded, “managerial systems” which guide the process of knowledge creation and control, and “the values and norms” that influence all other dimensions. Thus he regards IS as a component of core capabilities strategically important for differentiation of the company.

Day (1994) focuses on the capabilities to achieve and maintain organizational market orientation also notes that IS play a critical role in the organizational capabilities of the company. Day(1994) defined capabilities as complex bundles of skills together with accumulated knowledge, exercised through organizational process, enabling firms to make use of their assets (Day 1994: 38). He argues that in market-driven organizations, their mastery of “market sensing capability” and “customer linking capability” are especially important. Furthermore he maintains that information system plays an essential role in all organizational processes of acquisition, distribution as well as interpretation of market information and coordination with customers. For this perspective, IS are not positioned as commodities procurable on the market, but as a capability of the firm embedded in the organization processes of the firm.

Whether IS are commodities or conversely strategic resources, one may arrive at opposing conclusions depending on which perspective one may adopts; procuring IS as commodities in the market may cost less than developing it in-house, or IS must be developed in

organizational process regardless of cost because they are strategic resources. So, integrated discussion has been required (Watjartrakul 2005, McIvor 2009). Where and when IS become commodities to be procured at a lower cost, or as component of capabilities built up from within the company endowing it with a competitive advantage is an area we shall look at.

Previous researches indicate that when IS form reciprocal relationship with staff skill and processes within the organization, it has a possibility to bestow unique capabilities or advantages on the company. Leonard-Barton (1992) argues that because a core capability is an interrelated, interdependent knowledge system, it is difficult to separate and change any of the four dimensions which constitute the core capabilities. Even in the case of a new technical system, it will provide inimitable advantage if accompanied by new skills (Leonard-Barton 1992: 122). Moreover, Day (1994) points out that information technology enables organizations to learn new skills and thus develop new capabilities, promoting transformation of organizational processes. IS as capabilities are embedded in organizational processes, and at the same time constituting new organization processes. Because different organizational processes require different capabilities, imitating best practice of another company or procuring IS from the market may not contribute to achieve competitive advantages.

However, a guideline detailing how to develop IS as a capability of the firm, especially at the point of business' transformation, does not yet currently exist in existing literature. We will presently discuss about the management of IS within the framework of business system in transformation through the aid of exploratory case study.

3. Method

In this study the dominant methodology used is a case study specifically an exploratory case study, aimed at understanding management practices including business backgrounds and an analysis of management decisions. A case study is an effective method for exploratory research allowing us to ask "how" and "why" of high-context phenomena beyond the control of the researcher (Yin 1994).

The case study approach can be conducted adhering three principles of data collection proposed by Yin (1994), *vis-à-vis* data correctness. In analyzing this case study, we conducted several interviews with the management⁴ and examined published company documents as secondary data. This included literature published by the company, research papers about the textile industry, a company history and articles in newspapers and magazines, in order to gain an insight into the company and also to validate the primary data by comparing it with

secondary data.

The particular area of research concentrates on SEIREN Co., Ltd. (SEIREN). Founded in 1889 SEIREN has been in business for more than 120 years. Despite its wealth of experience, it was confronted with considerable difficulties caused by the structural depression of the textile industry in the 1970s.

Tatsuo Kawada⁵, who assumed the post of president of SEIREN in 1987, was responsible for the company's revolutionary corporate strategy. Subsequently SEIREN expanded its business over the past 20 years, a period marked by a prolonged transition within the business and centered on the development of a new strategic information system Viscotecs (Visual Communication Technology System) which later acquired a business model patent. Viscotecs, developed in-house⁶, integrates SEIREN's know-how in fabric dyeing by allowing quick and easy digital color fabric printing. To understand how SEIREN embarked on the design and implementation of Viscotecs we will first examine SEIREN's objectives and management practices.

4. Case Study —SEIREN

4-1. Business Backgrounds

In April 1889, during the growth of the silk production in Japan, SEIREN's predecessor, Kyoetsugumi was founded in Fukui prefecture⁷. At that time it was the first company to specialize in degumming row silk. In 1923 it diversified its business into dyeing by establishing a dedicated plant for its dyeing business.

After the prosperous years of the 1960s, the textile industry fell into a structural depression which persisted throughout the 1970s. The decline of Japan's textile industry was rooted in several factors: a voluntary export restraint to the United States, the Japan-US textile agreement, two oil crises and the rapid appreciation of the yen following the Plaza Accord. As a result, SEIREN's future in the textile industry in the early 1980s was in doubt. The textile industry of the time was marked by a host of inefficient systems; production was based on a traditional implementation of division of labor, and the distribution channel from production of row silk to marketing of the end item was overly complicated.

4-2. Corporate Transformation

Tatsuo Kawada was installed as the sixth president of SEIREN at a board meeting on August 28th 1987, having been promoted from managing director. President Kawada's vision for

SEIREN was bold; his aim was to revolutionize the company's business by breaking into new markets⁸. The following year in October 1988, Kawada presented his vision of SEIREN's new corporate strategy. He conceptualized SEIREN as a "high value-added company". He defined SEIREN's business as the creation of value-added materials and products by offering a multi stage process including planning, production and marketing. In addition, he expanded SEIREN's domain from dyeing, which consists of just one process in textile production, into broader markets related to lifestyle products that use textiles⁹. Furthermore, as the structures of production and distribution were changing from an industrial society to an information society, from mass to personal production, on-schedule to on-demand, supplier-driven to user-driven and real to virtual¹⁰, President Kawada embarked on four key strategies: (1) a break away from previous clothes and textiles production, (2) introduction of IT including a vertically integrated system, (3) globalization, (4) transition of corporate culture¹¹. For the purpose of this research, we will examine in specific detail the first of these two strategies, namely (1) and (2). Behind the breakaway from clothes and textiles was the aforementioned decline of the domestic textile industry caused by export restraints, appreciation of the yen and the rapid growth of the textile industry in South-East Asian countries. Against this background, Kawada initiated a departure from traditional markets and business practices in a bid to diversify steering SEIREN away from the declining textile industry. The Kawada-led plan would seek instead to use SEIREN's experience and know-how, its fiber processing technologies and material development technologies fostered throughout the company's history in order to break into new markets.

Kawada was responsible for launching the company's incursion into the production of interior materials for automobiles, which subsequently became SEIREN's primary product. SEIREN's involvement in this product was total; from planning to marketing such that it resulted in the company breaking away from its mainstay business, namely the dyeing process. Kawada presented five plans for non-textile products in 1988¹². The first was "Automotive products" or interior materials, such as aesthetic car seats and ceiling materials as well as other textile-related accessories for automobiles. The second was "High Fashion" including inner clothes, sportswear, interior related materials made from silk, cotton, wool and hemp as well as synthetic fibers like long-fiber polyesters. The third was "Electronics" such as plasma display panels, EMI shielding materials and dust protective sheets. The fourth "Bio-Medical and Industrial" composed of cosmetics and functional clothing. The fifth "Housing" included house walls and curing sheets.

Under Kawada automotive products became the core business of SEIREN. This new

relationship lead to new thinking practices within the company as it fostered new relationships with non-textile industries. During the mass motorization period of the 1970s most car seats were made from vinyl chloride material. Automobile manufacturers assumed that good quality textile materials had a lifespan of around 10 years, but, SEIREN believed it was possible to develop longer lasting materials using new textile related technologies. They targeted the automotive industry with prototypes of new car seats. It was at this juncture that SEIREN came face-to-face with practices in the automobile industry. Staff at SEIREN was surprised by the standards in the automobile industry: high-product quality, business systems defined by just-in-time production, and continuous requests for cost reduction and quality improvement at the heart of its business culture. Business dealings with the automobile industry resulted in the opportunity for SEIREN to recognize the possibility to redefine the position of textile related technologies and the necessity to implement a more efficient business system¹³. In 1975, when SEIREN entered production of car seats, Kawada decided to build an integrated production system in order to respond to the exact requirements from the automobile industry. Kawada foresaw the necessity to assume not only control of the dyeing process but also of related processes including knitting, weaving and sewing.¹⁴

Regarding the second key strategy, SEIREN introduced a vertically integrated system using information technologies. In textile production there are high seasonal variations as raw materials and fabrics such as cotton, wool and silk are harvested during specific seasons. Additionally consumers' preferences for apparel products are constantly changing. Participants in the textile industry traditionally assumed a one year production lead time, resulting in problems such as depletion of stock, hot-selling products, and a buildup of dead stock resulting in high-priced end products. How to adjust production volume in response to various demands and how to manage stocks was a serious problem not just for SEIREN but for the textile industry at large.¹⁵

Furthermore, Japan's textile industry was characterized by a complex division of labor in which each firm assumes piecemeal production during the various processes (see Figure 1).

Before the business transformation, SEIREN had assumed production of only the dyeing process, see Figure 1. Its primary business was to process orders, without taking inventory risks. In such a structure marked by the proliferation of subcontractors, low risks and low returns, where responsibility for the end products resides is obscure¹⁶.

President Kawada saw that such a complex division of labor coupled with the traditional value chain as barriers to increasing the competitiveness of the Japanese textile industry. He believed in the necessity of introducing a vertically integrated production system in order to

develop a new value chain to replace the traditional structure. This vertically integrated production system aimed to reduce losses by producing only hot-selling products during the sales season as opposed to producing the total volume in advance. To implement this system, SEIREN decided to deal with apparel companies and retailers directly, bypassing wholesalers and trading companies. This new business system required a wide variety of products in small quantities, quick delivery and stockless trading on the Net. The aim of this system was to produce only products that would sell, instead of products whose marketability was unknown. SEIREN decided to disregard traditional business practices offering instead its vision which enabled consumers to communicate with manufacturers directly and to get what they wanted when they wanted at a reasonable price.

Figure 1 The outline of the traditional Japanese fiber's business value chain

<source> Internal information by SEIREN Co.,Ltd.

(1) Barriers to Business System Transformation

As SEIREN underwent its business system transition, introducing an IT-led vertically integrated system, SEIREN's business partners changed from fabric wholesalers to apparel companies. However, the sales division struggled to procure contracts because of differences in lot sizes.

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