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A STUDY ON THE STRATEGIC ALIGNMENT PROCESS WITH INFORMATION TECHNOLOGY FOR NEW VENTURES: FROM A DYNAMIC CAPABILITY PERSPECTIVE

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Abstract

Many prior studies suggest that alignment between business strategy and IT strategy is a dynamic and continuous process, but few of them provide theoretic frameworks for this phenomenon. For new ventures, the alignment process involves with the process of resource reconfiguration to sustain competitive advantages in a velocity environment. Thus, in this paper we applied the dynamic capability perspective to analyze the entrepreneurial processes of a semiconductor company in Taiwan. This study aimed to explore how a new venture developed dynamic through integration and reconfiguration of IT resources to accomplish strategic alignment with their business goals.

The results indicate that explicitly intended alignment deeply assists with developing IT capabilities and resources, and achieving implemented alignment. The processes of resource transformation affect development of IT capability within the alignment process. However, intended alignment is restricted by agreement on out-dated business strategy and path dependence, caused by existed resources and insufficient support. Especially, path dependence forcefully limits IT strategy and IT capability both. The mission of IT department in each stage, which is challenged by momentous organization changes, is advocated by accumulative resources and is restrained by rigidity of resource. Effective learning for resource integration and applying additional resource on disruptive transformation could mitigate path dependence effects.

Keywords: Strategic alignment, IT capabilities, Dynamic capability perspective.

1 INTRODUCTION

In general, IT management can be conceptualized as a problem of alignment between organizations and IT to gain competitive advantages (Reich & Benbasat 2000). Strategic alignment is always the significant issue for IT management (Bergeron *et al.* 2004, Brown & Magill 1994, Burn, 1993, Reich & Benbasat 1996, Sambamurthy *et al.* 2003, Teo & King 1997). The state of alignment will vary as any alteration of environment, strategy, organization, and technology. To acquire and sustain strategic alignment is frustrating and difficult. (Sabherwal *et al.*, 2001, Grant 2003).

In prior studies for strategic alignment, some studies argued that *intended alignment* was dogmatically connecting with business performance (Van Der Zee & De Jong, 1999). Some scholars sought for ideal alignment patterns that categorized by relationships among organizational elements (Chan *et al.*, 1997, Bergeron *et al.* 2004). These points neglected strategy development and accumulation of IT capabilities. In contrast, other scholars regard strategic alignment as a process and not as a rational decision (Henderson & Venkatraman 1993, Sabherwal & Hirschheim 2001). Rare resources, capricious environment and previous experiences limit alignment process

This study assumes that “IT resources are the essential resources for operations of an organization. The values of IT rely on how to reconfigure IT resources for radical environment.” Thus, we focus on IT capability that reconfigures IT resources, and the process of strategic alignment. The research question is “*How does an organization develop its IT capabilities to deploy IT resources effectively, and to arrive the variant goals for the process of strategic alignment?*”

2 TOWARD A MODEL OF STRATEGIC ALIGNMENT PROCESS WITH DYNAMIC CAPABILITY PERSPECTIVE

Mintzberg argues that strategy itself has at least two different meanings (1978): one ‘take strategy as a plan’ (strategy-as-intend) and another ‘take strategy as a pattern’ (strategy-as-implemented). In the prior studies, scholars measure the level of alignment by the discrepancy of recognition on strategies between the executives and IS managers (Reich & Benbasat 1996, Burn & Szeto, 2000); Reich and Benbasat, 2000). In that approach, the studies treated alignment *as intended* and lacked thorough analysis on actual alignment between business strategy and IT strategy, which have been implemented. Thus, we argued that the meanings and related activities of alignment in different periods should be explained clearly.

From the literature, we summarized as three different perspectives to analyze alignment. First, *intended alignment* occurs as planning and discussing for alignment activities when organizations are at low alignment. The target of *intended alignment* is *implemented alignment*, which means results of alignment activities (Brow & Magill 1994). Another point is ‘strategic alignment process’ that is the process for *intended alignment* to be realized into *implemented alignment*. The three stages of alignment occur repeatedly because alignment is ‘a moving target at which organizations shoot’. Strategic alignment only exists for a short period after ongoing adjustments among organizational elements (Jarvenpaa & Ives 1993).

Today, most companies face capricious markets, global competition, and customer pressures. IT has become a part of daily operations within organizations. Information systems must be constructed rapidly and adapted with variant processes and changeable structure for request of customers and challenge from competitors (Ross *et al.* 1996). Thus, how to rapidly reconfigure IT resource with business development and environmental changes is an important issues for strategic alignment process.

The dynamic capabilities perspective, a conceptual framework focuses on the capability of resource reconfiguration, has been widely accepted in the literature (Eisenhardt & Martin 2000; Winter 2003,

Zollo & Winter 2002). The analytic framework described the dimensions of dynamic capabilities that include processes, positions, and paths (Teece et al. 1997). *Processes* describe the patterns of practice and learning in a firm; *positions* mean the specific assets including technological assets, intellectual property and complementary assets; and *paths* are a function of its past activities and positions. These dimensions and attributes help us to understand how to develop a firm's IT capabilities dynamically and then realize the goal of alignment with business strategy.

Following Teece et al. (1997), this paper argues for the importance of dynamic capability perspective in strategic alignment process for IT management. The concepts emphasized by dynamic capability perspective, such as 'evolution', 'learning', 'resource reconfiguration', and 'path dependence' are coincidental or complementary with the characteristics of strategic alignment. For new ventures, which are usual with immature IT capabilities, the IT capability development might be the critical factor for their alignment processes. Thus, in this study, we consider IT capability as *a kind of dynamic capability that reconfigure IT resources to support other core resources of organizations*. This could provide us a fresh viewpoint and analytic aspect for this research area (Wheeler 2002).

Figure 1 illustrates the conceptual research framework that integrates the concepts from previous discussions with literature review. In addition, the objectives of this study are summarized as following:

- To understand how *intended alignment* influences the constructive process of IT resources.
- Using dynamic capability perspective to analyze the strategic alignment process between IT and organizations.
- To understand how strategic alignment process influences the result of *implemented alignment*.

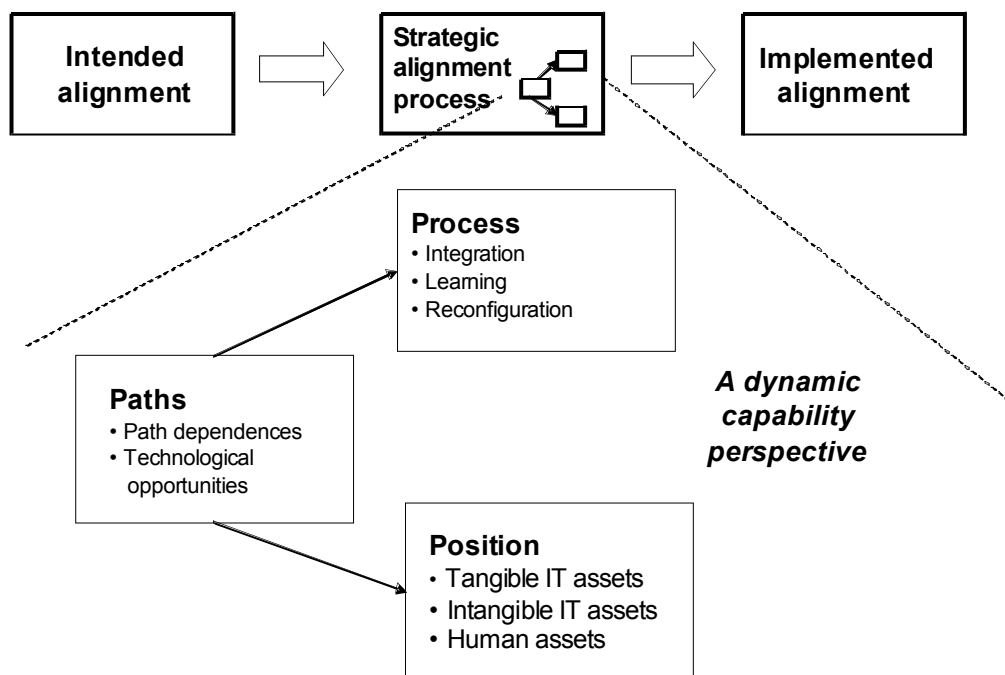


Figure 1. A model of strategic alignment process with dynamic capability perspective

3 RESEARCH DESIGN

3.1 Research methodology

The purpose of this study is to obtain a better understanding of creation and development for IT capabilities, and particularly how these capabilities interact with IT strategic alignment process within the complex organizational contexts. The rich data with sensitive nature is required for the research issues of a process view and multiple embedded units (Yin, 2003). Thus, this study adopted a naturalistic research approach. A qualitative, interpretive, case-based research strategy was implemented and a single case study was employed. Moreover, the focus of this study was on the events associated with changes in alignment process over time. In order to understand the processes of thought underlying major decisions, it was essential to incorporate the perspectives of senior business and IS executives.

The case selected for study is a semiconductor company that focuses in advanced IC package technology. We use the pseudonyms SEMI Corp. to represent the case company. Semiconductor Industry is one of the technological industries experiencing escalating complexity and uncertainty with acute information-processing challenges (West & Iansiti 2003). For the risk of operating a vertically integrated company increasing dramatically, most companies dedicate themselves to one or more parts of the process.

With the case company, we examined changes in both business and IS strategies and structures over a long-term period of eight years. SEMI Corp. was visited fourth – in August 1999, July 2001, February 2003, and June 2004. The events were studied retrospectively through intensive, nondirective interviews with the executives involved in strategic IS management. Interview were arranged with middle and top managers (10 people), IS staffs (8 people), and project members of IS implementation (15 people). A total 62 hours of interviews were conducted. Each of the formal interviews was taped, while extensive case notes were taken on informal conversations and observations while on-site at the research locations. A wealth of other documentary evidence was also gathered.

The practice of disintegration and fierce global competition has motivated parties in the industry to emphasize close relationships in addition to process technology and manufacturing excellence. The relationships among the partners of the value chain are changeable and continuously evolving for new competitors and technological innovation. Organizational changes in these companies are violent, especially at entrepreneurial stage. It is complicated for IS managers of these firms to align with unstable organization structure, changeable processes, and capricious strategies. Thus, the entrepreneurial process of a semiconductor company is greatly appropriate for our research issues.

4 THE STRATEGIC ALIGNMENT PROCESS OF SEMI CORP.

4.1 Introduction of the case company

Founded in 1997 by semiconductor industry veterans, SEMI Corp. was the early pioneer in Taiwan to provide wafer-bumping service and had been growing to become a technology leader in the industry. SEMI Corp. is located in Hsinchu Science-Based Industrial Park in Taiwan where the excellent IC design companies, wafer fabrication foundries, and packaging/testing houses are located. The geographical cluster effect makes one-stop shopping available for customers. SEMI Corp. provides turnkey solutions of advanced IC package service especially for display drivers of IC industry.

Characterized by a high level of entrepreneurship, SEMI Corp. was managed in an ad hoc fashion with few controls. For aligning with organizational strategy and supporting daily operations of each department, IS department employed many IS projects continually or concurrently, including ERP

system (Enterprise Resource Planning), MES (Manufacture Execution Systems), decision support systems with BI (Business Intelligence technology), and B2B (Business to Business) data exchange systems.

4.2 The entrepreneurial process of SEMI Corp.

The case covers the period from 1997 until 2004, its net worth grew rapidly from 20 million USD to 333 million USD, and number of employees ranged from 90 to 1250 dramatically. According with the events of SEMI Corp., we divided the entrepreneurial process into four stages: (1) the pioneering stage (1997- 1998); (2) the mass production stage (1999- 2000); (3) the economic deflation stage (2001-2002); and (4) the extension stage (2003-2004). The organizational changes and IS activities for alignment in each stage are described as following.

4.2.1 Period I (1997- 1998): The Pioneering Stage

In the pioneering stage, as unsteadiness of manufacturing process and lack of verification by customers, SEMI Corp. acquired sale orders with difficulty. Without a stable cash flow, its strategy tended toward decreasing cost wherever possibility. within addition to inadequate budgets, each department became an individual island of information, and did not integrate with others through IT infrastructure. The information systems of different function areas operated separately. IT department only maintained PCs and local networks without significant goals. Thus, the perception of IS as non-strategic was accepted by executives and IS manager.

In this stage, the requirement for IT capability was basic technology skills. The focus of alignment was on IT skills and maintenance for simple IT applications. The level of *implemented alignment* was still high, but was really not a strategic role.

4.2.2 Period II (1999- 2000): The Mass Production Stage

When 1999 the manufacturing service of wafer bumping had been verified by several large customers, sale orders and production yield increased gradually. For the prediction of growing market space and the expectation of developing rapidly, SEMI Corp. expanded its capacity immediately by acquired capital from the stock market, and started to explore another IC package technology.

The executives recognized the necessity of IS integration, and requested the IS manager to build up the IT infrastructure and application systems. However, the adoption of ERP systems was performed by the executives without deliberation on requirement and appropriateness. The selected ERP system was unsuitable and ERP vendors were not familiar with semiconductor industry. The first IS manager left his job in protest for this thoughtless decision.

The next IS manager took over the dilemma. He had to adopt outsourcing as IT strategy for inadequate IT capabilities, and used the by-phase approach strategy for IS implementation. The by-phase approach could reduce the burden of IT staff, and decrease risk and difficulty as radically organizational development.

Although the entrepreneurs recognized that IT was necessary as the company was growing, they still paid little attention to IT strategy. SEMI Corp. set up a small, centralized IS department, which was isolated from other business functions. As the quantity of production greatly increased and the staff of each department expanded rapidly, most employees were junior and they were unfamiliar with their jobs. The implementation of ERP system became extra burdens for them. Most inexperienced staff also could not provide exact requirement on information systems. In addition, for lack of executives' participation, it was tough to proceed ERP implementation and business process redesign. The IS manager remarked: I used a very 'soft' style of implementation, meeting with each department, modifying the systems by their requirements, and setting the systems on-line according to the schedule

they accepted. Many workers had worked over time every day. I should reduce the load as much as I could.

Besides, most employees came from different companies, and for the decentralized business structure, SEMI Corp. had few standards and minimal concern for proper records. It was difficult for the IT staff to integrate the operational procedures under lack of standards. In addition with misfits of applications and inappropriateness of consultants, it took long time and lots of cost on system customization and process adaptation.

In this stage, although the executives provided financial budgets, they still did not confront the importance and difficulty of IS implementation. The executives did not invite the IS manager to join with the strategy planning. Thus, the IT department throughout lacked sufficient time to response with each significantly organizational change. The out-dated *intended alignment* caused shortsightedness. The inappropriate decisions broadened the impacts of *path dependence* that caused by previous resource acquirement.

4.2.3 *Period III (2001- 2002): The Economic Deflation Stage*

In 2001, the new plant had built up completely, and many new competitors joined the rising market. Later, with the deflation of economy, the quantity of market requirement dramatically reduced, and customers still eagerly requested better quality with lower cost. In addition, with the low yield of another IC package service, SEMI Corp. grew slowly and even went backwards. Although the condition was detrimental, it offered opportunities and time for SEMI Corp. to improve operation, and to strengthen business structure. IT staffs had plenty of time to build up IT applications that supported multi-plants and different products.

Facing the competition of new entrants, SEMI Corp. altered its product strategy, from single manufacturing service into turnkey solutions, which expanded from wafer package to include wafer probe testing, wafer sawing, IC package and final testing. When each different manufacturing process combined with existed processes, numerous shocks occurred in organizational structure, operational procedures, and especially information systems.

The complex relationships among collaborative companies resulted in complicated procedures of material management, including lot tracking, yield control, cost apportionment, and cost calculation. The specific requirement and continuous changes resulted in large scale customization of IT applications.

The variety and extension of product strategy not only increased the complexity of operations, but also became the obstacles of IS implementation, especially along with the effects of trial-and-error as well as delay. The IS manager remarked: The implementation of systems follow with the development of the company. Why does it become so complex? Such as there are three factories now. When each plant was built up, we re-implement the systems again. For the vast differences between the later product and earlier ones, we have had to communicate with another business unit, and modify the systems again as if we were supporting another company.

During this stage, the IT executives began to be deeply concerned about maintaining closer relationships with customers. The position of IS manager was elevated to IS director. As a result, the *intended alignment* between executives and IS director was improved. It is noted that the physical IT infrastructure as tangible assets was easily and speedily implemented along with sufficient budgets, but the alignment between IT applications and operations took a long time to be established.

4.2.4 *Period IV (2003- 2004): the extension stage*

After struggling with the impact of a shrinking economy, the advantages of providing turnkey solution services had become more obvious. Moreover, the pressure of cost reduction caused integration and merger among competitors and partners within the value chain. SEMI Corp. acquired other similar

companies, and became the largest vendor of wafer package in the world. By 2004, it owned four plants located in different areas and varied countries. The fusion among different companies, including integration with various processes, and numerous jumbled IT applications, had become the new challenge for the IT department.

During the extended time of organization, the chasm between IT staff and users was getting worse. For the IT staff, they not only were responsible for satisfying the requirement of users, but they also were responsible for the consistency of the application infrastructure. The consistency of IT not only increased IT efficiency but also reduced their workload and maintenance. From the viewpoint of users, efficiency on operations was more important than IT efficiency. They usually took into account the entire service level of business goals, not just the technological level. However, IT staff suspected that the users usually submitted requests just for their individual benefit.

The executives and IS manager selected and adopted the software and vendors by considering the requirement, financial budget, and IT capabilities in each period. Perhaps they had made the correct decisions for their duties in each stage. As the limitation of insufficient resources and unexpectedly rapid growth of business, it was not easy to make optimized choices for the future in long term. Thus, SEMI Corp. replaced its information systems as required for continuous growth. For example, the MES systems had been replaced three times by 2004. In addition, the ERP system had also become a distinctive and unique 'monster' for continuous mass customization. After many battles over eight years, SEMI had grown up as a world-class company, and the consideration of replacing ERP system emerged again. Nevertheless, for its specific operational processes, the unanswered question was could the new system escape from the destiny of customization?

In this stage, the packaged software lost its flexibility and connectivity after mass customization. SEMI Corp. had to invest more capital on IT resource for system replacement. In addition, the efficiency of IT resource depended on IT capabilities of IT staff. The high turnover rate caused by heavy work loads and arguments with users resulted in the waste of duplicated resources on IS implementation and training. The *implemented alignment* built in prior stages declined more rapidly as IT staff flowed outward.

4.3 Case summary

Table 1 lists the summary of case description and analysis. Based on our research framework, we summarize the alignment process of the case on table 1, which represents in different stages the alteration of IT resources, IT capabilities, paths, processes and alignment states. The position and path dimensions are the abstracts from the facts that have been detailed in previous section. The process dimension and alignment states are mainly a summary, which was extracted from our interview data and observation. The emergence and level of each capability were discussed by the researchers and were verified by the interviewees.

In the pioneering stage, SEMI Corp. was a small company without support of any consortium. For focusing on their advanced technology and optimistic prediction on market, SEMI Corp. was not deeply concerned with the construction of management standards. Its strategy emphasized the agility with fluctuation of the environment. When customers verified its products, it expanded the capacity fast to grasp opportunities. At this point, the explicitly *implemented alignment* was favorable to obtain required IT resource.

For lack of capability on in-house development and for the requirement of timely response, SEMI Corp. adopted outsourcing to procure IT resource. Moreover, they learned the practice and skills during the process of implementation. Although outsourcing strategy could achieve the middle level of *implemented alignment* in a short time, it took long periods to *internalize* the knowledge of vendors and consultants.

As the rapid growth of SEMI Corp., IT staff reconfigured resource repeatedly to respond to the violent changes of business. For the externality and uncontrollability caused by outsourcing strategy, the

alignment process was fulfilled with the heavy burden of IS maintenance and IT inflexibility. SEMI Corp. could only adopt dramatic transformation approach to re-implement information systems. This approach consumed more resource and time.

Stage	The pioneering stage (1997~1998)	The mass production stage (1999~2000)	The economic deflation stage (2001~2002)	The extension stage (2003~2004)
IT Resources (Position)	Isolated applications in each department were maintained.	Communication and database infrastructure was built with inappropriate ERP systems.	Great efforts focused on mass customization of ERP and MES systems for expansion of product strategy. Several specially made systems still were finished.	MES was rebuilt and there were three different ERP systems in different sites, which would be replaced later.
Prior decisions and existed resource (Path)	N/A	The neglect of IT in prior stage caused thoughtlessness on IT strategy even with increased financial support.	Inappropriate IS adoption and out-dated alignment caused extra efforts on IS customizations.	The merging among companies sharply influenced the complex and rigid applications, which were suitable to use before.
IT Capabilities	Technical skills (L) Business understanding (L) Problem-solving orientation (L)	Technical skills (L) Business understanding (L) Problem-solving orientation (L) Architecture planning, Sharable platform and databases (M) IS maintenance and change management (L) relationship building (M) Informed buying (M) vendor development (L)	Technical skills (M)↑ Business understanding (M)↑ Problem-solving orientation (M)↑ Architecture planning, Sharable platform and databases (H)↑ IS maintenance and change management (M)↑, relationship building (H)↑, contract facilitation (M) contract monitoring (M)	Technical skills (M) Business understanding (M) Problem-solving orientation (L)↓ Architecture planning, Sharable platform and databases (M)↓ IS maintenance and change management (L)↓ relationship building (M)↓
Process	Learning	Learning Integration (L)	Learning Integration (M)↑ Reconfiguration (M)↑	Learning Integration (H)↑ Reconfiguration (H)↑
Alignment Type	IT alignment (M) Loosely strategic alignment (M)	IT alignment (M)↑ Strategic alignment (M) Structural alignment (L)	IT alignment (H)↑ Strategic alignment (M) Structural alignment (M)↑	IT alignment (H) Strategic alignment (H)↑ Structural alignment (M)↓

Table 1. The summary of SEMI Corp.'s alignment process and IT capabilities.

(Remark: The symbol 'L' denotes that low level, 'M' as medium level, 'H' as high level. The levels are not measured absolutely, but are indicators compared with prior or later periods.)

5 DISCUSSION

This study applies dynamic capability perspective to examine the process of alignment between IT and organizations. The case was used to better understand the alignment process evolved with IT capability development and resource reconfiguration. As discussed below, our results integrate prior literature and provide some new insights for scholars of information management and for strategic IS management in particular.

5.1 Intended Alignment evidently influences developmental process of IT capability

The strategy of SEMI Corp. in the antecedent stages was vague and capricious. In quest of struggling for an advantageous position in the value chain of semiconductor industry. The continuously evolving strategies led to dramatically organizational changes and varied IT maneuvers. To align IT plans with latest business blueprint was troublesome.

Even though *intended alignment* would be outdated sometime, it still strongly influenced the developmental process of IT capability. In each stage, IS manager elaborated the maneuver that adhered to the commitments built on the *intended alignment* in the prior period. The maneuver declared essential IT resources and related IT capabilities, as well involved with financial capital and human assets. Thus, *intended alignment* apparently influences the process of IT capability development, even *intended alignment* is not always up to date with the latest business strategy.

5.2 The developmental trajectory for IT capability is closely related to the process of resource transform

Through analyzing SEMI Corp., we find that the developmental trajectory for IT capability was closely related to the process of resource transformation. It supports the concept of Day (1994) that categorized capabilities by three types of resource transformation processes: *outside-in*, *inside-out*, and *spanning* (Wade & Hulland 2004).

In this case, ‘external relationship with vendors’ and ‘response to internal customers’, which are categorized as ‘outside-in’ capabilities, were developed first. Moreover, it followed with ‘IS infrastructure building’ and ‘IT skill training’ which are categorized as ‘inside-out’ capabilities. As IT applications were getting prevalent and requirements for IS support were increasing; ‘IS-business partnerships’, ‘intention for problem-solving’ and ‘business knowledge understanding’ which are categorized as ‘spanning’ capabilities, became the important competence for the extension and integration of IT resource.

5.3 Existed IT resources cause path dependence effects on IT strategy

The deep structure that affects IT capability development is inertia caused by *path dependence* and learning mechanism. The concept of *path dependence* issued by dynamic capability perspective emphasizes that ‘history does matter’. Thus, a company’s previous investments and existing resources constrain its future decisions and subsequent actions. For example, SEMI Corp. employed related commerce applications that were compatible with its ERP systems, and the IS Manger made these decisions for shorter periods on learning and integration even though these were actually not the best choices. The example illustrates that the planning of IT strategy is not always the consequence of prediction with rational actor theory. The force of *path dependence* deeply affects many critical decisions.

5.4 Path dependence effects deteriorate by insufficient resource and nearsightedness

Insufficient resources and nearsightedness also constrained the alignment process of SEMI Corp. The prospects of SEMI Corp. were uncertain in the pioneering stage, and there were insufficient resources to assist enduring infrastructure for IT applications. Thus, IS Manager constantly outsourced various projects to build application infrastructure gradually and to cultivate the IT capabilities. However, the adopted IT assets could not be modified or abandoned arbitrarily, even product strategies, organizational structures, and daily operations had altered later.

Inappropriate application infrastructure limited viable options, so SEMI Corp. could only apply shortsighted strategy to deliver response timely and temporarily. Although modifying IS without careful consideration was inexpensive and speedy in the short term, it increased the complexity of applications and required replacement rather than maintenance in the long term. As a result, the flexibility and efficiency of IT infrastructure declined rapidly.

5.5 Use accumulated knowledge or external forces to decrease constraints of path dependence

The phenomenon of *path dependence* is a result of learning, which is often a process of trial, feedback, and evaluation. Opportunities for learning will only be near to previous activities (Teece et al. 1997). Thus, efficiently employing knowledge and effectively learning could reduce the side effects of path dependencies. Such as SEMI Corp., there was no packaged system fitting with its unique requirement on material control. It still developed and customized a corresponding system through concentrated interaction and valid learning between IT staff and users.

Other approaches to decrease restriction of *path dependence* are through the external forces to conduct resource reconfiguration or business transformation. Most externally driven forces originate in the following conditions: (1) the radical change of information technology, and expensive cost of maintenance on legacy systems; (2) weakness of ability on maintenance caused by IT outsourcing and (3) with rapid growth of business, IT infrastructure lacked of flexibility for emergent demands.

6 CONCLUSIONS

Alignment between IT and organizations is an important indicator for evaluation of IT effectiveness. In this study, we expanded the content of alignment as *intended alignment* and *implemented alignment*. From identification of *intended alignment* to realize into *implemented alignment* within daily operations in organizations, the ability of resource reconfiguration to offer critical resource is an essential element for alignment process. Thus, this paper applied dynamic capability perspective to analyze the alignment process with IT capability development.

The result shows that explicit *intended alignment* is valuable for steady elaboration of IT resource and IT capability development. The accumulated IT capabilities definitely influence the alignment process and the achievements of *implemented alignment*.

In addition, the result also shows that the phenomena of *path dependence*, caused by existing IT resources, would be deteriorated by shortsightedness and escapism. In addition, with shortage of *intended alignment*, *path dependence* will heavily restrict the value of adopting IT, waste investments in redundant IT resources, resulting in absence of effectiveness. Our suggestion is to enhance the activities of organizational learning for utility of resource integration. To obtain appropriate resources by external forces supporting transformation is also greatly valuable. These tactics could apparently decrease the side effects of *path dependence*.

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