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Building a process model of local adaptation of practices: A study of Six Sigma implementation in Korean and US firms

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Abstract
The strategic transformation of Asian firms into global players has involved the adoption and adaptation of many organizational practices developed in the West. We build a process model of adaptation by observing how an organizational practice is adapted to a local setting different from its locus of origin, through inductive methods and case studies of Six Sigma implementation in Korean and US firms. Based on these cases, we propose a cascading, sequential pattern to the local adaptation of the conceptual, social and technical dimensions of organizational practices, reconciling conflicting views in the literature on whether or not to adapt. Our theoretical model highlights the importance of considering the different degrees of contextual influence on different underlying dimensions of a practice, and of configuring each dimension accordingly. Further, we suggest that the sequence and configuration of adaptation across different practice dimensions matter to the successful implementation of a practice across borders.
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INTRODUCTION

In recent years the growth of non-Japanese Asian firms, traditionally known as "late movers" (Bartlett & Ghoshal, 2000), has stood out in the global economy. Among the Global Fortune 500 companies in 2007, there were 55 non-Japanese Asian firms, constituting more than 10% of the entire list. More interestingly, this number had increased from 46 in 2006 and from 39 in 2005. This rapid advancement of Asian firms in the ranks of the top global players reflects the tremendous efforts that these firms have made in order to catch up to world-class standards. Bartlett and Ghoshal (2000: 136) discuss the most common challenge that such late movers often confront: "the gap between technical requirements and design norms at home and world-class standards abroad". For most Asian firms, "going global" means having to make major changes to overcome this gap.

One popular approach for a firm to catch up with world-class standards is to benchmark and adopt organizational practices already proven effective by global market leaders. For example, since the late 1990s, many South Korean (referred to as Korean

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hereafter) firms, led by national corporate leaders such as Samsung and LG, have adopted Six Sigma in order to transform their conventional ways of doing work into globally competitive practices. Six Sigma is a particular approach that originated in Motorola in the mid-1980s, targeting the goal of near perfection in meeting customer requirements. There are numerous other examples of so-called "advanced management practices" that were created by global market leaders and subsequently diffused to late movers: Total Quality Management (TQM), Process Reengineering, and Management by Objectives, to name a few. Such practices are assumed to create value for the firm both from the superior techniques they deliver and from the legitimacy their adoption confers in the global market.

However, it is also the case that the implementation of such a new practice is difficult, as it often requires drastic changes in the organization's mindset, culture, and actions (Klein & Sorra, 1996; Reger, Gustafson, Demarie & Mullane, 1994). The difficulty becomes even greater when a firm adopts a new practice from overseas, owing to contextual differences between the environment in which a practice originated and the one in which it is adopted (Kostova, 1999). Facing such difficulties, firms tend to *adapt* a given practice to make it work better in their own unique environment. As more and more Asian firms join the global market, we can expect that they will increasingly adopt so-called world-class best practices from overseas. Consequently, how those firms effectively manage the adaptation and implementation of these practices becomes critical for their success.

In the international management literature it is relatively recently that scholars have started to pay attention to the *adaptation of organizational practices* (Jensen & Szulanski, 2004), although local adaptation has been a key concept in international management research for a long time. The earlier work on local adaptation focused mainly on the transfer of products and advertising campaigns to multiple geographical locations (e.g., Ramarapu, Timmerman, & Ramarapu, 1999; cited in Jensen & Szulanski, 2004). Organizational practices refer to how organizational members conduct their work in a firm setting on a routine basis (Kostova, 1999; Sinha & Van de Ven, 2005). Given that implementing new organizational practices depends on influencing the behavior of organizational members, managing their implementation and adaptation involves a greater level of complexity and nuance than, say, the adaptation of a product or an advertising campaign to local conditions. Therefore the adaptation of organizational practices merits study in its own right.

Szulanski and his colleagues (Jensen & Szulanski, 2004, 2007; Szulanski & Jensen, 2006; Winter & Szulanski, 2001) have led the discussion on adaptation of practices in the international management literature. Their focal question has been whether adaptation is helpful or harmful for an effective practice transfer and subsequent implementation. Although their studies have made tremendous contributions regarding the impact of adaptation on practice transfers, their research framing focuses on adaptation as dichotomous (either adapted or not adapted), and the major focus of their work is on the outcomes, rather than on the factors influencing the extent of adaptation, or the mechanisms or the timing of adaptation. As a result, many questions still remain unanswered in the literature regarding how adaptation unfolds, and what the mechanisms involved in the adaptation process are, when a practice is implemented in a new environment. Some studies have discussed the process of adoption and implementation (e.g., Jensen & Szulanski, 2007; Szulanski, 2000), but few studies have provided an in-depth observation of the *process of adaptation*. What we add to this literature is a focus on the factors, the conditions, and the mechanisms involved in adaptation processes.

In this study, we take the first steps toward building *a process model of adaptation of organizational practices* in the international management context. We ask the following two questions: when a practice is implemented in a very different environment from its locus of origin, how does the adaptation unfold, and what mechanisms drive the adaptation process? We build theory using a case research methodology and a combination of inductive and deductive methods (Eisenhardt, 1989; Glaser & Strauss, 1967; Yin, 1984). Specifically, we use an inductive theory-building approach by studying Six Sigma implementation in several US and Korean firms, following some of them through quarterly meetings over 2 years, while simultaneously refining our model with a focused, paired case study of one US and one Korean firm in the same industry. We use this grounded theory approach based on our belief that theory building is "the close interplay between theory and reality" (Van de Ven, 2007). Furthermore, case studies contribute to theory building by providing

a "concrete example of every construct that is employed in a conceptual argument" (Siggelkow, 2007: 22).

In addition, Korean firms are late movers to the global market (Bartlett & Ghoshal, 2000), and have been adopting various global best practices including Six Sigma and adapting them to their unique contexts, with the intention of becoming world-class players. Therefore the close observation of the experiences of a focal Korean firm compared with those of a US firm in the same industry provides helpful insights into the strategic transformation of Asian firms seeking to compete in a global market.

In building our model, we highlight the fact that organizational practices are multidimensional by nature (Kedia & Bhagat, 1988; Kostova, 1999; Winter, 1990). Although many scholars have recognized the multidimensionality of organizational practices (e.g., people, product, and process-embodied – Kedia & Bhagat (1988); hard vs soft – Winter (1990); technical vs social – Kostova (1999)), few studies have incorporated it in their theory-building efforts. Consideration of the underlying dimensions is important, in that different dimensions have different characteristics; thus the adaptation of different dimensions may involve different factors and mechanisms, and require different managerial approaches. We focus particularly on three underlying dimensions of an organizational practice – the conceptual dimension, the social dimension, and the technical dimension – based on both theory and inductive case observation. We track the adaptation processes of each of these dimensions across the cases, and identify a sequential pattern and the process mechanisms associated with the sequential pattern. This approach enables us not only to understand the adaptation process in detail but also to provide helpful managerial insights into how adaptation of each dimension may be better managed in order to obtain better implementation outcomes.

This paper is organized as follows. In the next section, we discuss previous studies on adaptation. We first review relevant studies in the organization literature, in which *adaptation processes* have been studied for a longer period. We then review studies on adaptation of practices in the international management literature. Next, we describe our case setting and methods. We then present our case study findings and build a theoretical model. Finally, we discuss the implications of our findings for future research and for practitioners.

ADAPTATION OF ORGANIZATIONAL PRACTICES ACROSS COUNTRIES

Adaptation is one of the most extensively studied concepts in management research. In this study we focus on the *adaptation of an organizational practice* that occurs following an adoption decision, during the implementation stage. We define adaptation as a deliberate departure from or a modification of the original practice, or of a previously working version of a practice (Szulanski & Jensen, 2006). Therefore organizational adjustments that occur as natural and gradual responses to environmental change are not within the scope of our study. Additionally, the adaptations examined in this study are ones that occur in a deliberate manner by managers as purposeful managerial interventions in order to obtain better implementation outcomes. In this respect the concept of adaptation used here is similar to what Szulanski and Jensen (2006) call a "presumptive adaptation" that occurs based on managers' presumption that "the adapted practice can be made to work despite the diminished capacity, or even loss, of the original as a referent" (Szulanski & Jensen, 2006: 939).

Previous Studies of Adaptation in the Organizations Literature

Early studies of adoption, diffusion, and implementation of new technology or innovation programs have observed that any original template is usually altered while being implemented (Rogers, 2003). Rogers (2003: 17) states, "Adopting an innovation is not necessarily a passive role of just implementing a standard template of the new idea. Many adopters want to participate actively in customizing an innovation to fit their unique situation". Researchers in this stream of research have given some thought to adaptation processes. Leonard-Barton (1988: 252) argues that, "Implementation is a dynamic process of mutual adaptation between the technology (in use) and its environment". The dynamics of the process unfold as misalignments between the technology and the adopting environment are corrected by altering the focal technology, or by changing the environment, or both. Van de Ven (1986) also suggests that new technologies not only adapt to the existing environment; they also make the structure and practices of the environment adapt to the new technologies. Although these studies (Leonard-Barton, 1988; Van de Ven, 1986) highlight the importance of taking a dynamic perspective in understanding adaptation,

they do not delve into the details of the adaptation process other than to advance the notion of mutual adaptation.

Tyre and Orlikowski (1994) specifically address the temporal pattern of technology adaptation by asking whether adaptation is a gradual or a discontinuous process. They report that the process of adaptation in technology implementation is highly discontinuous. Also, they observe that most significant adaptation occurs during a short period following initial installation of the focal technology, concluding that "beginnings are of special importance" in adaptation (Tyre & Orlikowski, 1994: 114). This stream of research later converges to the structuration view, which perceives technology implementation as a social construction process (Barley, 1986; DeSanctis & Poole, 1994; Orlikowski, Yates, Okamura, & Fujimoto, 1995). Studies taking this view suggest that the preexisting structures of an adopting environment constrain the interpretation of a technology in its initial implementation, resulting in different interpretations of the same technology across different adopting settings. The distinct interpretations in each adopting environment shape unique patterns of social interactions among organizational members, which subsequently change existing institutional contexts. This contextual change in turn leads to modifying how the focal technology itself is being used.

These studies provide helpful insights on which to build our study. It is especially notable that implementation of a new program (such as a new technology or an innovation program) leads to a broad range of organizational change, as it provides "windows of opportunity" (Tyre & Orlikowski, 1994) for technical as well as structural changes in an organization. It is also vital to understand that the initial interpretation of a given technology determines how it is used later; and the initial interpretation is constrained by preexisting conditions in an organization. However, the technologies that these studies have examined (mostly information technologies) tend to have a set template only for the technical aspects of implementation. There is wide latitude given to the adopting unit in the conceptualization of what the technology is meant to achieve, and in the social aspects of how to structure the work. Thus the conceptual and social dimensions of these technologies are left entirely to the discretion of the adopting environment. In contrast, organizational practices such as TQM and Six Sigma usually have a more detailed template with regard to what the conceptual principles are, what specific techniques or methodologies are to be used, and how teams or work units should be organized to obtain the intended benefits of the practice. We know little about how adaptation of such a template would unfold in various adopting environments.

In addition, these studies have been conducted in a domestic setting only. Therefore there is little knowledge about how sociocultural contextual differences across countries affect the adaptation process. Scholars have shown that organizational culture and structure are deeply engraved in national-level culture and institutional norms (e.g., Lincoln, Hanada, & Mcbride, 1986; Perlow, Gittel, & Katz, 2004). Thus organizational structure and culture are often too rigid to change in a short period of time, even when a newly implemented practice from overseas is not well aligned with the preexisting organizational culture and structure. Therefore it is uncertain whether the notion of mutual adaptation between structure and a focal innovation program (Leonard-Barton, 1988; Van de Ven, 1986) will be as prevalent in the international management context as the previous studies suggest.

Studies on Adaptation of Practices in International Management Literature

Studies in the international management literature to date have focused mainly on the question of "whether to adapt or not". In most studies, *adaptation* and *exact replication* of a practice have been perceived as conflicting mechanisms, in that only one or the other is preferred for successful implementation (e.g., Jensen & Szulanski, 2004, 2007; Szulanski & Jensen, 2006).

Scholars rooted in *cultural and institutional traditions* have highlighted the context-dependent nature of organizational practices (Kostova, 1999) and argued *for* adaptation. Observing that how work is conducted in firms is significantly different across countries, studies in this stream stress that when a practice crosses national boundaries, and is implemented in an environment different from its locus of origin, cultural and institutional differences across countries tend to force the adopted practice to depart from its original form (Guillen, 2001; Kostova & Roth, 2002; Rosenzweig & Nohria, 1994; Westney, 1987). For instance, Beechler and Yang (1994) found that a subsidiary of a Japanese multinational company located in New York City was unable to implement parent company practices, such as long-term employment opportunities,

owing to the high rates of employee turnover. Therefore the Japanese subsidiary had to adapt its practices to conform more closely to American-style practices. Westney (1987) observed the historical evolution of Japanese social systems since the Meiji restoration of 1868. Japan initially imitated Western models, such as the French police and the British postal service, in order to build its modern social systems. However, these social systems eventually emerged as unique and specific in response to Japanese social conditions, thus departing from the original models. These studies suggest that an adopted practice is often transformed into a distinct and unique form to fit appropriately with the local environment; yet such departures do not necessarily make the adapted practice inferior to the original. On the contrary, the adaptation can further increase the effectiveness of the practice, as it can enable people to accept the new practice more easily.

On the other hand, scholars rooted in the *knowledge-based view* of the firm tend to argue *against* adaptation as an effective mechanism for knowledge transfer. Szulanski and his colleagues (Jensen & Szulanski, 2004; Szulanski & Jensen, 2006; Winter & Szulanski, 2001) consistently show that the adaptation of a practice to achieve fit with a particular environment increases the difficulty of transfer (i.e., stickiness), and consequently undermines implementation outcomes. For example, in Szulanski and Jensen's (2006) study of an Israeli branch of a multinational franchise company, the adaptation of a standardized action plan provided by the company's headquarters was negatively associated with the subsidiary's performance in the growth of the local franchise network. Departures from the original action plan made the top managers of the Israeli branch lose a referent, with which they could track down the causality between their adaptation attempts and outcomes. As causality became obscure, top managers had difficulty figuring out what to do next in order to accomplish a given task within a given time frame. As a result, adaptation diminished the value of the original practice as a referent in diagnosing and solving problems in the new setting (Szulanski & Jensen, 2006).

Scholars have conceded that many practices are at least moderately complex (Rivkin, 2000) and causally ambiguous (Winter & Szulanski, 2001). Therefore it is difficult to predict how adaptation attempts influence the implementation processes and outcomes in each unique adopting environment. Moreover, Zaheer (1995) points out that understanding a host-country environment involves substantial difficulty, and requires significant learning costs. She found that foreign subunits sticking to routines imported from the home-country headquarters outperformed those adapting their practices to a local host-country environment (Zaheer, 1995). These studies suggest that adaptation should at least proceed with caution, and should be based on a proper understanding of both the original practice and the host-country environment. Until the causal relationships between an adaptation and its impact have been thought through, it is perhaps best to follow the template of the original practice, at least initially.

These previous studies in the international management literature show that adaptation is both inevitable and widely prevalent. Also, they suggest that implementation outcomes of practice transfer/adoption attempts are closely related to how the adaptation of the practice is managed. However, the field's focus on the causal relationship between adaptation and implementation outcomes results in a bright-line division between the conditions of adaptation and no adaptation, and subsequent contrasting managerial implications, with little consideration of the nuances of timing or of the multiple dimensions involved in adaptation. In order to extend the current knowledge base about the adaptation of a practice, especially in the international management context, it is necessary to look into the processes and mechanisms of adaptation more thoroughly.

Multidimensionality of Organizational Practices

Another limitation of the previous studies on adaptation is that few studies have incorporated the multidimensional characteristic of practices in their theory-building efforts. Studies suggest that different dimensions underlying a practice are affected by sociocultural contexts to different degrees. Rosenzweig (1994: 29) argues that because "social variables are inherently social, which are concerned with such things as role specialization, norms of behavior, and the values in which norms are embedded", their transfer across countries is likely to be affected by the sociocultural contexts of the transferring parties. In contrast, the transfer of technical variables is likely to be untouched by such sociocultural factors, because technical variables are usually less involved in

human interactions, and because they usually have external referents (Rosenzweig, 1994). Zaheer (1995) reports similar findings in her comparison of foreign currency trading rooms in Tokyo and New York. According to her observation, the technical aspects of trading rooms (such as procedures for trading currencies and physical office layouts) were almost identical, whereas the social aspects of the trading room (such as control mechanisms) were significantly different across these locations. These studies highlight the importance of taking characteristics of different dimensions into account in studying the adaptation of an organizational practice.

In this study we distinguish the conceptual, social, and technical dimensions underlying organizational practices. The conceptual dimension indicates the principles guiding a given practice, such as the stated objectives, the intended benefits, and the rationale for adopting the practice (Reger et al., 1994). The social dimension is mainly concerned with how to manage interactions among people and task units. For example, managing spatial and vertical communication flows, motivating and controlling employees, and organizing task units would be included under the social dimension. The technical dimension, on the other hand, refers to particular techniques, methodologies, and guidelines that practice users are supposed to use. In other words, the technical dimension tends to have "an external referent; that is, a tangible object in the real world with which they correspond" (Rosenzweig, 1994: 30). For example, using hard numbers and figures, following concrete step-by-step guides, and working with particular tools and methods would all be included under the technical dimension.

Among the numerous possibilities that exist for identifying the different dimensions underlying a practice, we argue that the conceptual, social, and technical dimensions are commonly observable across many organizational practices. Of course, one dimension could be more salient than the other, depending on the nature of a practice. For example, some narrowly defined functional practices (e.g., performance appraisals in HR, quality control in operations) may put more of an emphasis on the technical dimension, while some broader "strategic organizational practices" (Kostova, 1999), such as TQM and Six Sigma, tend to take the social dimension more seriously. Nevertheless, most organizational practices in firms are likely to contain all three – the conceptual, social and technical dimensions – to a greater or lesser extent.

CASE SETTING AND METHODS

In this section we first discuss our focal organizational practice, Six Sigma. We then describe our case setting, which is situated in the context of Asian firms' strategic transformation. A detailed description of our research design and methods follows.

Focal Organizational Practice: Six Sigma

We select Six Sigma as the focal organizational practice for three reasons. First, Six Sigma is currently one of the most popular and frequently adopted organizational practices around the world. Second, Six Sigma is a practice affecting a broad set of organizational activities in adopting firms. Finally, Six Sigma clearly is multidimensional, containing the conceptual, social and technical dimensions, all of which are regarded as equally important elements in Six Sigma (Choo, Linderman, & Schroeder, 2007).

Six Sigma originated in Motorola in 1985. Facing the threat of Japanese competition in the electronics industry, Motorola defined an ambitious quality goal of achieving less than 3.4 defects per million opportunities (DPMO). This goal is predicated on process variability being $\pm$ 6 standard deviations (σ) from the mean, resulting in a 99.99966% process yield. In other words, the term *Six Sigma* reflects a goal of near-perfection in meeting customer requirements. Following its initiation in Motorola, Six Sigma became popular thanks to General Electric's success in using it. Former GE CEO Jack Welch wrote in the company's annual report that Six Sigma had saved the company more than $2 billion in merely 3 years (Pande & Holpp, 2002). Currently, numerous US corporate giants, including 3M, American Express, and Honeywell, as well as mid- to small-sized firms in the US and many other non-US corporations, such as Allianz, HSBC, and Samsung, have adopted Six Sigma and have published their success stories. The media's interest in Six Sigma continues, and *Businessweek* (11 June 2007) even reported on the downside of Six Sigma as a potential restrictor of creativity in a cover story.

Six Sigma shares the same pedigree as TQM and other quality management initiatives, but has distinct features and characteristics. It indicates a clearer goal (3.4 DPMO) than its predecessors. It also provides specific methods and tools to achieve that goal, such as statistical analysis and

detailed step-by-step problem-solving methodology (e.g., DMAIC – Define, Measure, Analyze, Improve, and Control). Different from TQM (which was concerned mainly with production and operations functions), Six Sigma emphasizes a systemic view toward problem-solving, which requires managers to consider entire business processes rather than focusing on just part of a problem. Therefore Six Sigma projects usually involve simultaneous changes across various elements of business processes (Pande & Holpp, 2002).

Definition of the original Six Sigma template. The concept of adaptation requires the articulation of the original and adapted practices for comparison. Therefore defining the original form of Six Sigma should precede the case observation. Different from company-specific organizational practices, a practice such as Six Sigma has many publicly available materials, such as books and articles, that define its core characteristics. While there have been several "flavors" of Six Sigma in practice (most notably the GE version compared with the original Motorola version), the core characteristics that define Six Sigma appear fairly consistent and stable across companies and industries.[1]

To identify these core characteristics of Six Sigma, we examined a number of publicly available materials describing Six Sigma in some depth. As a result, we could characterize the features of the original Six Sigma as described in Table 1. The first three elements indicate the conceptual principles behind Six Sigma – customer focus, strategic initiative, and business process improvement. We call these the *conceptual* dimension of Six Sigma. The second three elements reflect the specific tools and methods that Six Sigma participants are supposed to use in conducting a given task. In this study, these elements are referred to as the *technical* dimension. The last three elements specify how to manage people and task units participating in Six Sigma, which emphasizes cross-functional teamwork, top management involvement and selection/motivation of the right people. We refer to these elements as the *social* dimension.[2]

Case Setting

Asian challenges. Our case studies are situated in the context of Asian firms' strategic transformation. As more and more Asian firms expand their businesses to foreign markets, and as greater numbers of multinational enterprises enter into their domestic territory, Asian firms increasingly face strong pressures to change and to accommodate global norms and rules by importing concepts and practices from the West. However, these changes are usually difficult for Asian firms to embrace, for a variety of reasons, including a lack of hard and soft

Table 1 The original template of Six Sigma

Dimension	*Descriptions*
Conceptual dimension	*Customer focus*: Six Sigma is an initiative to make an impact on customer satisfaction and value. *Strategic initiative*: Six Sigma is a firm-level initiative as opposed to an operational/functional initiative: therefore it is closely linked to the firm's strategic direction. *Business process improvement*: Business processes are where the Six Sigma action is.
Technical dimension	*Fact/data-based approach*: In Six Sigma projects, clear measures should be defined in order to identify project goals and to evaluate the project performance. Throughout the project, decisions should be made based on data and facts. *Predefined roadmap (e.g., DMAIC)*: Six Sigma projects should be conducted according to a predefined set of steps – mostly DMAIC (i.e., define – measure – analyze – improve – control). *Statistical and group processing tools*: Various techniques are recommended to use in order to help one better understand, manage, and improve a business or a process. Some of the key tools are brainstorming, flow charts, and statistical analysis.
Social dimension	*Cross-functional teamwork*: Six Sigma projects are better to be undertaken by a team composed of members from any related functional areas to a project goal. *Top management involvement*: Top management, including the CEO, should create a vision of Six Sigma and should be actively involved in Six Sigma activities. *Selecting and motivating the right people*: It is recommended that the firm selects highly talented employees and provides them with incentives such as rewards and recognition to participate.

infrastructure (Khanna & Palepu, 1999) as well as cultural and institutional barriers. In particular, the cultural differences between the West and Asian countries present significant challenges to Asian firms in adopting a new practice, because cultural differences often create different behavioral assumptions (Bhagat, Kedia, Harveston, & Triandis, 2002; Kedia & Bhagat, 1988).

The culture of Asian countries is often characterized by its emphasis on hierarchical order and harmony (Westwood, 1997). Westwood (1997) observes that in Asian countries a leader's authority is derived from structural power differentials, and is maintained through the extant structural arrangement, rather than through followers' recognition of the leader's contribution to group success or progress. At the same time, Asian culture emphasizes harmony among societal members. This emphasis is reflected in Asian management principles such as Korean *Inhwa*, Japanese *Wa*, and Chinese *Guangxi* (Alston, 1989). In seeking harmony, Asian societies and firms expect their members to follow the rules of proper behavior within the status hierarchy, and to recognize existing socio-structural arrangements, thus maintaining social order (Westwood, 1997).

It is important to recognize this emphasis on hierarchy and harmony in understanding Asian firms' strategic transformation, because it influences a firm's structural arrangements and the communication patterns involved in strategic change. For example, compared with the Western Weberian organizational system, where structure and position are impersonal, in Asian cultures that value hierarchy and harmony, the policies, decisions, and procedures introduced by a leader are viewed as personal orders, making it difficult for followers not to comply (Westwood, 1997). Also, with regard to compensation, when the harmony of societal or organizational members is important, singling out one individual or one unit for outstanding performance with monetary incentives not only threatens the productivity of the group as a whole, but reduces or destroys the subsequent effectiveness of the individual or the unit (Yoshino, 1976). Given that cultural tendencies in the West are aligned with the preference for equality, less autocratic leadership, and less centralization of authority (Gibson & Zellmer-Bruhn, 2001), the implementation of practices originating from the West in Asian environments is likely to create significant misalignment and confusion. Nevertheless, most books or articles for practitioners provide recipe-like guidelines, only pressing for a closer convergence toward Western business models (Khanna & Palepu, 1999).

Six Sigma implementation in Korean firms. Given this context, we use Six Sigma implementation in Korean firms to illustrate the challenges faced and efforts made by Asian firms to achieve strategic transformation. A comparison of Six Sigma implementation in Korean and US firms can be particularly insightful, for the following reasons. First, the US is where Six Sigma originated; and Korean firms have actively adopted Six Sigma since the late 1990s. Therefore Six Sigma is not new, and it has been well institutionalized in both countries. Second, the national culture and the institutional environment of Korean firms are known to be very different from those of US firms (House, Hanges, Javidan, Dorfman, & Gupta, 2004), providing us with an opportunity to study adaptation across richly different contexts.

From around 1996, several Korean firms that were suppliers to GE started to adopt Six Sigma, as GE pushed its suppliers to adopt it for the purpose of quality control. Six Sigma experts from GE visited these Korean firms and provided training programs. Therefore the GE version of Six Sigma in particular became the initial form that diffused to the Korean Six Sigma community. A few years later, as these early adopters started to announce positive outcomes from Six Sigma initiatives, many other Korean firms joined the Six Sigma bandwagon, and the use of Six Sigma proliferated. The diffusion of Six Sigma in Korea was initially led by conglomerate groups such as LG, Samsung, SK, and POSCO, followed by adoption in many other business sectors such as financial services and research institutes, as well as in public services such as government agencies (Bae & Cho, 2005).

Research design. In order to understand the process and the mechanisms involved in the adaptation of a practice in greater depth, we adopt a comparative case study approach to elicit concepts and relationships, which we triangulate both within and across cases of Six Sigma implementation in Korean and US firms. We started out with observation of quarterly Six Sigma focus group meetings over a 2-year period (May 2003 – November 2005), where a number of US firms in different industries met to share knowledge and issues on Six Sigma practices and implementation, facilitated by a US regional Six Sigma Institute. In these meetings the

first author received permission to sit in as an observer and observe confidential presentations of nine US firms (five of them in the Fortune 500). She also obtained an actual Six Sigma project deliverable at a US Fortune 500 food manufacturing company, and conducted an intensive interview with the project participants. These meetings and the interview were very helpful in understanding what the baseline accepted practices of Six Sigma were in the US, and helped us develop our understanding of the original template of Six Sigma (described in Table 1). Simultaneously, in 2004, the first author followed up with pilot case studies based on interviews and archival material from three Korean firms in two industries, and began surfacing areas where Six Sigma implementation was similar to and different from what had been observed in the US firms. These pilot case studies helped us develop an interview protocol and a questionnaire to be used for the final round of more detailed case studies. The last round in 2006 involved the development of detailed case studies of two Korean firms, one in the steel industry (which was later used for triangulation within Korea) and the other Seoul Financial, and of one US firm, American Financing.[3] We also had access to internally circulated Six Sigma documentation (over 70 pages of the power point format) in these three firms, 13 research reports on Six Sigma implementation from practitioner-oriented research institutes, and 11 corporate documents in the public domain describing these firms' Six Sigma practices. In presenting our model below, we focus on describing our findings only from Seoul Financial and American Financing, in the interests both of brevity, and of greatest comparability across the cases, as they are two firms in the financial services industry, both belonging to resource-rich diversified conglomerates, and are considered exemplars of Six Sigma practice in each of their home countries.

Seoul Financial is a domestic market leader in the Korean insurance industry, with around 6000 employees. This firm is an affiliate of the Seoul Group, which is at the forefront of the Korean economy in many industries. The brand "Seoul" is very well-known worldwide. The Seoul Group began to adopt Six Sigma in 1996, and Seoul Financial adopted Six Sigma in 2002. Currently, Seoul Financial is known as the most advanced case of Six Sigma application among all services industries in Korea. Six Sigma at the Seoul Group is frequently benchmarked by both domestic and international firms. The CEO of the Seoul Group was even interviewed by the American Society of Quality about the firm's successful deployment of Six Sigma.

The US firm, American Financing, is an affiliate of the American Group, which has been regarded as a "textbook case" of successful Six Sigma implementation. American Financing itself is also cited by many Six Sigma books for practitioners as an exemplar. The main business of American Financing is leasing and managing clients' property. The number of employees is 2900.

We compare how these Korean and US firms respectively use Six Sigma, and track down why each firm ends up with the form of Six Sigma each currently practises. Of course, these two firms do not represent their respective countries, nor are they necessarily "best-practice" companies. However, this study aims to build theory (as opposed to testing theory). Also, both the firms selected for this study are influential and well-known in their respective countries as well as worldwide. Therefore in-depth observation of these firms can provide significant insight into what is missing from our current state of knowledge. In accordance with this case design, we limit our theoretical validity to large firms that aspire to be more competitive in the global market, and which have sufficient resources to carry out adaptations as they wish.

Data Collection and Analysis

Our primary data collection at these two firms was through interviews conducted at each case site with employees as well as with executives involved in Six Sigma projects. Through a process of asking our initial contacts in the firms to recommend others who would be most knowledgeable about the evolution and adoption of Six Sigma at each firm, we were able to conduct in-depth interviews with four key informants in Seoul Financial and with five key informants in American Financing respectively. These informants were key employees and managers who had been involved with Six Sigma in each of the firms for a number of years, and brought with them current knowledge as well as a historical perspective. To incorporate diverse views within each of the firms we made sure that this group included interviewees from different levels in terms of Six Sigma certification (e.g., master black belt, black belt[4]) and from different functional areas, with the help of a key informant at each site.

The interviews at American Financing and Seoul Financial were all conducted in the fall and winter

of 2006. As the primary investigator can speak both languages (Korean and English) fluently, we used the language appropriate for the interviews at each site. Each interview was face-to-face and semi-structured, with the questionnaire prepared prior to the site visits. The questionnaire focused on how the original template of Six Sigma, described in Table 1, had been applied in that firm. Since the questions were open-ended, the interviewees described their impressions, experiences and opinions with regard to each element of the original Six Sigma template, in a free and casual manner. Each interview lasted 40–60 minutes. All of the interviews were recorded using a digital voice recorder.

While developing our theoretical model with a direct comparison between Seoul Financial and American Financing, as described earlier, we also used the following supplementary qualitative data in order to ensure validity and reliability of the emergent theoretical relationships and triangulate our findings:

(1) Additional interview data (transcribed verbatim) from a large steel manufacturing Korean company conducted in 2006 (with eight managers; 5 total people-hours).
(2) Four meeting minutes with four different managers in three additional Korean firms (two firms from manufacturing and one from the energy industry; 5 total people-hours). These meetings were conducted in 2004. In those meetings, managers described how Six Sigma had been implemented and was being used in their respective firms.
(3) Confidential presentation materials of nine US firms (five of them Fortune 500 firms) that described each firm's Six Sigma activities at a detailed level. These materials were obtained by the primary investigator of this study while participating in the quarterly Six Sigma focus group meetings facilitated by a US regional Six Sigma institute for 2 years (from November 2003 to May 2005; attended six meetings; 24 meeting-hours).
(4) One actual Six Sigma project deliverable in a US Fortune 500 food manufacturing company.
(5) Additional publicly available documents, including 13 research reports from four different practitioner-oriented research institutes, and 11 corporate documents (from various web sources) describing each firm's Six Sigma in use. These materials were used for within- and between-method triangulation.

To increase the reliability of this data collection procedure, we developed and followed the case study protocol (Yin, 1984).[5]

For the analysis, we first transcribed the recorded interviews. The Korean scripts were translated into English, and we let another person verify this translation in order to increase its reliability. We then conducted a within-case analysis by reading the scripts of each case, line by line, and inserted relevant labels and comments with no perceptual restrictions (Strauss & Corbin, 1998). This micro-analysis helped us fully understand and become familiar with these qualitative data, as well as helping us develop emergent constructs. As a next step, we followed Eisenhardt's (1989) cross-case analysis technique by comparing similarities and differences observed in the adaptation of each dimension (i.e., the conceptual, social, and technical dimensions) at Seoul Financial and at American Financing. This procedure enabled us to identify the factors and mechanisms involved in the adaptation process. As a result of an iterative process in which we repeatedly went back and forth between the data and an emerging conceptual model, we surfaced several insightful theoretical relationships. These theoretical relationships were cross-validated with our supplemental data. We also constantly checked whether or not there were any inconsistencies across the interviewees from the same company in their descriptions of focal constructs.

OBSERVATIONS AND THEORY-BUILDING

We first describe the cascading sequential pattern that we observed in the adaptation of Six Sigma, and the process mechanisms associated with the adaptation in the Korean firm, Seoul Financial. Then we compare this adaptation pattern with our observations on the US firm, American Financing. Based on these observations and comparison, we develop a set of propositions on the adaptation of a practice. Finally, we present the results of cross-validation of our theoretical model with supplemental data.

Conceptual Adaptation

The initial contextual influences on the adoption decision. Since the Asian economic crisis in 1997, Korean society overall has experienced a nation-wide innovation movement accompanied by rapid institutional changes. From that time, change and innovation have become a central focus of the entire Korean economy, as Korean firms started to

realize that unless they drastically changed their traditional ways of doing business, they could not survive global competition. Coincidentally, the years 1996 and 1997 were the time frame during which Six Sigma was first adopted by several companies in Korea (as explained in the previous section), and Six Sigma was suddenly spotlighted as an effective innovation methodology for firms to follow in Korea.

At the firm level, Seoul Financial has been a dominant market player in the domestic insurance industry, and it had aspirations to build a world-class organization. This firm-level aspiration was strongly influenced by its parent group. In January 1998, right after the economic crisis, the Seoul Group announced a group-wide drastic innovation plan covering restructuring of its diversified businesses, innovating corporate-governance structures, and improving financial reporting systems. Following this trend, Seoul Financial also started to use a "change management team", which led the organizational change activities associated with group-wide innovation movement. This team later evolved to become the "management innovation team" that took charge of Six Sigma deployment and its subsequent management in the firm. The following statement illustrates the contextual influences on the adoption decision of Six Sigma in this firm.

> There was a stream of innovation movement in the Seoul Group, and Six Sigma adoption at Seoul Financial was an extension of this stream. … Top managers at the Group level believed that Six Sigma would be the best way to make the innovation stream continue through the entire group. Thus it was suggested that the rest of the Seoul affiliates [that had not adopted Six Sigma yet] adopt Six Sigma. So, we adopted it in 2002. Our top managers wanted to revive the momentum for innovation and change one more time through Six Sigma.

Misalignments. As Six Sigma was adopted under the great theme of "corporate innovation", there emerged some misalignments between the original template of Six Sigma, especially in the conceptual dimension, and the adopting context. In particular, in this adopting context, Six Sigma needed to be seen as something very powerful that could bring about changes to the entire organization and operations from top to bottom. Also, in order to maintain such a grand-scale innovation initiative, top managers needed to secure the legitimacy to continue down this path by showing significant and tangible outcomes from using Six Sigma, to other organizational members. However, the emphasis of the original Six Sigma template on customer satisfaction and business process improvement did not appeal to many executives of Seoul Financial, because these were seen as narrowly focused, and implied that Six Sigma was just a tool to improve particular functions rather than to create large-scale organizational transformation. The following statements illustrate this misalignment.

> At first, we applied the concept of customer satisfaction in selecting projects. That resulted in projects such as "improving processes for call center service", which was actually a good fit with the Six Sigma method. However, at the corporate level, the results were too minute, and executives were not really interested in such a project or in the project results. Also, we applied the Six Sigma method to the finance function, and we improved, for example, the rate of collecting loans. But again, the impact on the entire company was not big enough.

Adaptation. Facing such a misalignment, Seoul Financial adapted the original conceptual framing of Six Sigma to fit its own aspirations. All the interviewed managers emphasized, "Our company motto is *management=innovation=Six Sigma*". Accordingly, whereas the original Six Sigma template emphasizes customer satisfaction, strategic initiatives, and business process improvement as core conceptual principles, Six Sigma at Seoul Financial put less emphasis on customer satisfaction and on business process improvement. The following statements illustrate this distinct conceptual framing:

> We know that Six Sigma is a great tool for process improvement. However, as the focus of our Six Sigma becomes a tool for improving the entire management of the company, there are areas that are not necessarily defined as processes. For example, think about one of our strategic goals, "target the affluent market segment." We cannot pinpoint any particular process involved in this goal. Therefore some executives even say, "do not call Six Sigma a process improvement methodology." Six Sigma, at this firm, is [designed] to improve the overall management [of the firm] rather than to improve processes only.

> When we develop Six Sigma goals and projects, customer satisfaction is used as an important philosophy, but all the goals are not coming from what customers want. Because management equals to innovation in our company, you need a different Six Sigma paradigm. In other words, you can include "customer satisfaction", but the ultimate objective of Six Sigma is not just about satisfying customers.

Figure 1 illustrates the different conceptual framing of Six Sigma observed in Seoul Financial, compared with the original template of Six Sigma.

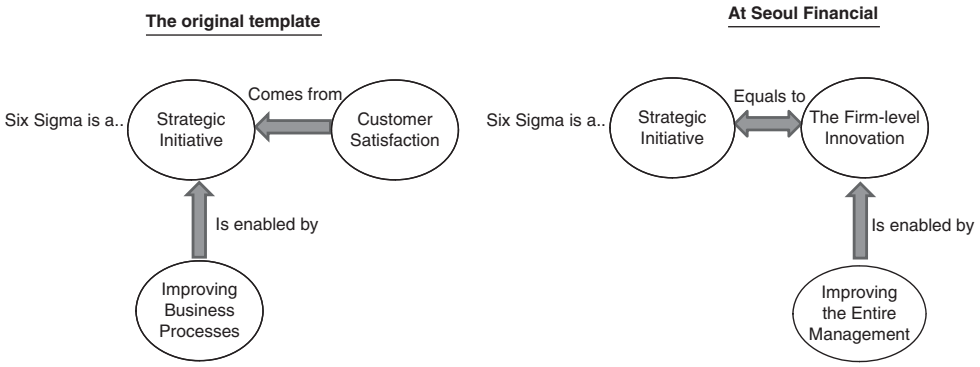

Figure 1 A different conceptual framing of Six Sigma.

Social Adaptation of Six Sigma

Emergent conditions from the conceptual adaptation of Six Sigma. The altered conceptual framing of Six Sigma as an enabler of firm-wide innovation at Seoul Financial resulted in the firm's emphasis that everybody should get on board. In order to boost the innovation movement throughout the organization, it was critical to make all organizational members participate in the initiative. Therefore the firm pushed every functional area to take part. The following statements support this emphasis.

> From the first wave of Six Sigma at our company, we emphasized that every functional division, including auditing and staffing that are not the traditionally applied areas in Six Sigma should take part. Now, there is no area that does not do Six Sigma in our company.

This "All-In" approach, however, required different organizing mechanisms from the original template of Six Sigma, which suggests selecting highly talented employees to participate, and focusing on a few projects that will deliver the greatest strategic impact at a given point in time.

Contextual influences. In terms of organizational structure, Seoul Financial had several business units (BUs), such as Product Development, Sales, and Channels. The leaders of these BUs (most of whom are at the executive level) have their own key performance indices (KPIs), and each BU runs with an eye on its leader's KPI. In addition, aligned with the high value orientation toward hierarchy in Korean society overall (House et al., 2004), Seoul Financial also had an organizational cultural orientation of hierarchy and authority. Regarding the firm's organizational culture, one manager stated:

> For example, we do not use 360 degree performance appraisal system: not because we do not know about that but because it can hurt leadership. Organizational hierarchy and order must be maintained.

Misalignment. The emergent conditions from the conceptual adaptation of Six Sigma (i.e., the "All-In" approach), and the firm's organizational structure and culture did not fit appropriately with what the original Six Sigma template suggests in terms of how to arrange work groups and how to provide compensation.

More specifically, with the BU structure and the cultural emphasis on hierarchy and authority, it was difficult to execute extensive cross-functional work, because the KPIs of the executives were often in conflict. One manager explained:

> Think about this. KPIs are critical for executives because, different from the employee level, they can be fired if they do not accomplish their KPIs. Oftentimes, KPIs of different BUs are in conflict. Salespeople are only concerned about sales, and product development people are only concerned about product development. Therefore it is extremely difficult for them to work together well.

Another manager added:

> Since the initial adoption of Six Sigma, we have emphasized cross-functional work. However, there was much conflict between the different teams and units. It was difficult to clarify the responsibility for a task. Cross-functional work could be done only when you, as a team leader, had enough power and authority.

Adaptation. The misalignment described above resulted in the social adaptation of Six Sigma.

Specifically, the cross-functional teamwork intrinsic to the original Six Sigma template was managed quite differently in Seoul Financial. *Cross-functional work in this company, in a most interesting departure from the original, was coordinated and conducted through the organizational hierarchy*. First, firm-level Six Sigma goals that required cross-functional effort were split into a number of lower-level divisional/functional goals. While the firm-level goal conceptually determined how many different divisions needed to work together in order to achieve that goal, actual project teams were formed *within* the relevant divisions or functional units, and tasks were conducted at the divisional/functional level. In this way, most Six Sigma tasks were carried out with minimal actual cross-functional interaction, while critical cross-functional issues were handled only by top-level managers. Figure 2 illustrates the comparison between what the original Six Sigma template suggests and what we observed at Seoul Financial.

This hierarchical arrangement of cross-functional work is also reflected by the firm's labeling of projects by hierarchical titles, such as the "CEO project", the "champion project", or the "BB (i.e., black belt) project", depending on who had primary responsibility and control. More interestingly, these projects were also linked hierarchically. The following statements illustrate this hierarchical arrangement of cross-functional work more specifically:

> Let's take the example that I am working on. My project is about "reinforcing the customer-serving system". We call this a CEO project as the CEO owns this project, which means we report the project status occasionally to the CEO. Under this CEO project, there are six champion projects [owned by divisional heads (mostly executives)], under which 14 BB (Black Belt) projects are being conducted. Actually, the CEO project or the champion projects exist conceptually. These projects indicate who has responsibility and control. The actual work is done in the BB projects.

> All the executives at Seoul Financial have their own KPIs. Each KPI becomes a Champion project in which a given executive has the full responsibility and control for the project. Each Champion project typically has two to three BB projects. Currently 60 BB projects are running in the company. In one BB project, there is one full time Black Belt and five to six [part-time] team members. Black Belts are typically middle-level managers.

In addition, the mechanisms used to motivate people to participate in Six Sigma were also quite significantly adapted. Rather than attracting a few highly talented employees to participate in Six Sigma, Seoul Financial put a great deal of emphasis on every organizational member's participation in the Six Sigma movement. Accordingly, the firm used fairly strict and formal employee control mechanisms, such as officially requiring Six Sigma

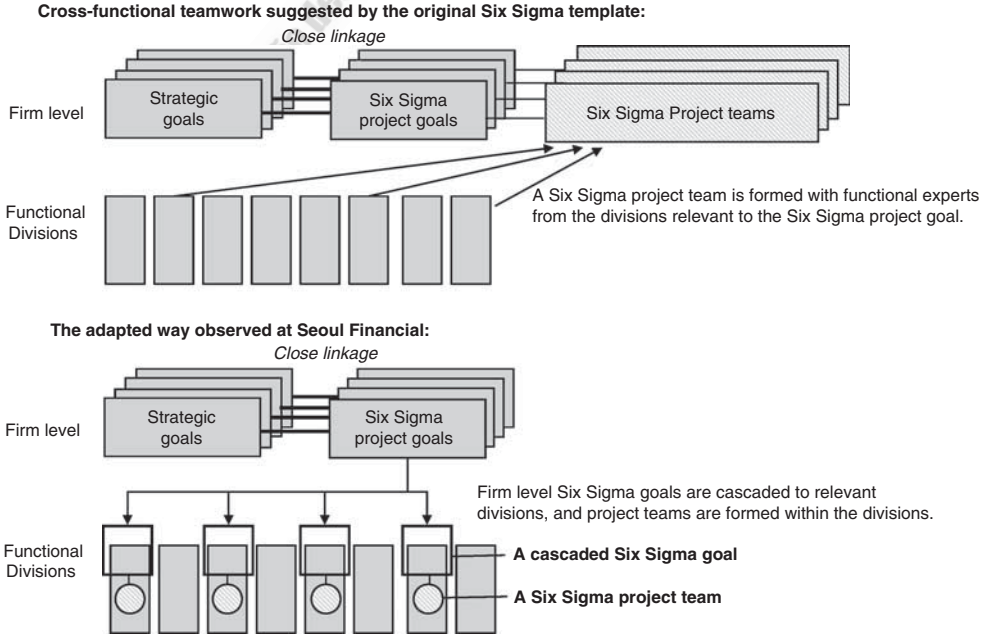

Figure 2 Different ways of operating cross-functional teamwork.

belt certificates for promotion, and providing higher scores in performance appraisals to people with Six Sigma experience. Additionally, to promote executives' active participation, every executive's KPI was tightly linked to a firm-level Six Sigma goal in a named "Champion Project", so that executives had little choice but to be actively engaged in Six Sigma.

An interesting observation related to this social adaptation is that adaptation occurred relatively early in the implementation phase. In other words, rather than deploying the cross-functional team projects right away as the original template suggests, Six Sigma projects were conducted at the divisional level first, without much collaboration across different divisions. As the need for cross-functional work grew, Seoul Financial started to apply the hierarchical arrangement of cross-functional work from within the BU level, and only later gradually expanded the scope to the firm level. A manager described this process:

> From July 2004, we launched a "champion project", which spans different parts within the same business unit. Before then, most projects were conducted within the same part. Then, from 2005, we initiated the concept of a "Mega Project", and "CEO project", which is led by the CEO and BU leaders, and which requires collaborative approach across different BUs.

Technical Adaptation of Six Sigma

Emergent conditions from the social adaptation and further misalignments. While most of the Six Sigma projects started to be conducted at the functional level within a hierarchical arrangement of cross-functional work, not all functions were suited to the application of the original Six Sigma methodology.

The following statements illustrate some misalignments created as a result of the emergent conditions:

> Different from manufacturing industry, our business has a sales orientation. Finding a problem based on data analysis does not provide many helpful implications because, in many cases, sales people already know what the problems are. Thus, rather than finding a problem and its root causes, Six Sigma methodology is used primarily to develop logical thinking and to make objective decisions in projects.

> Salespeople do not have enough time to take all the steps of defining, analyzing, and improving problems. They have to react to market needs as promptly as possible.

Adaptation. As Six Sigma projects are typically conducted in various functional divisions under the hierarchical arrangement, Seoul Financial has significantly modified the original DMAIC roadmap by developing new logics in order to achieve a better fit of Six Sigma with the firm's key functional areas. For example, it has developed the "Six Sigma Sales Stimulation Program", "Six Sigma for marketing", and "Six Sigma for master planning". One manager states:

> In some projects, we advise our project teams to take the Analyze phase first prior to the Measure phase. In this case, we call it DAMIC instead of DMAIC.

An interesting observation related to this adaptation is that although the DMAIC roadmap has been modified into different forms, this adaptation did not occur right away. Although organizational members were not used to the new methodology, such as handling statistical tools and following the DMAIC process, the firm expended much effort and time training its employees and enforcing compliance with the original Six Sigma template methodology for several years. One manager described it thus:

> When we first began Six Sigma, the DMAIC was rigid. At that time, we had no choice but to follow the discipline. We gave the project members one month each for each phase of the DMAIC. We really stressed, "You have to strictly follow each step, even the sub-steps, as predefined ways."

It is only recently that the modified DMAIC process has started to be applied to their various corporate functions (5 years after the initial adoption), and that Six Sigma managers have started to work on systematically institutionalizing the modified methodology.

A Comparison of the Adaptation Process between Seoul Financial and American Financing

American Financing, the US firm, had not experienced any major national-level pressures similar to what Korea had been through, since Six Sigma was first used in Motorola in 1986. Therefore the original principles of Six Sigma have been maintained relatively intact, and have been integrated with the concept of "continuous improvement of quality and process" that has existed for a long time. At American Financing, the firm framed Six Sigma as a tool for achieving process excellence to reach firm-level strategic goals tightly aligned with the "customer focus" philosophy. This conceptual framing of Six Sigma at American Financing is very close to what the original Six Sigma template suggests (see Figure 1). At this firm, the customer focus philosophy was truly a starting point based

on which all strategy, business goals, as well as Six Sigma project scope and goals were determined.

As Six Sigma was understood as a tool to improve business processes, as suggested by the original template, the scope of Six Sigma projects could be relatively easily defined by targeting particular business processes. As each project team was working toward a specific process-oriented goal, inputs and outputs from various functional units could be defined relatively clearly. Accordingly, project teams could be formed with clear role specifications for each of the team members coming from various functional units. The organizational context in terms of hierarchy and authority was not mentioned by any interviewee as an issue. All of these factors allowed project leaders in American Financing, unlike those in Seoul Financial, to manage cross-functional teamwork under his or her own leadership.

As a result, the cross-functional team was fostered as the basic unit for all Six Sigma tasks. One interviewee stated, "I can't think of any project that doesn't have cross-functional involvement". Typically, each project team had a project champion, who was an operational leader. Several black belts and master black belts were assigned to work with the project champion. Then key metrics were defined, mostly by the master black belts and black belts, and, depending on those metrics, several people from relevant functional areas were selected to form a team. Annually, eight to ten Six Sigma project teams are formed by linking the project goals with the firm's operational goals, which are in turn aligned with its annual strategic goals. These project teams are sometimes interdependent, but most of the time they work just on their own goals. To manage potential conflicts caused by cross-functional work, managers at American Financing emphasize project leaders' management skills, and specifically their ability to foster a common vision and focus on larger objectives.

At American Financing as well, Six Sigma project engagement and the black belt and master black belt certifications have become a critical career path for successful employees. It has become a tradition that highly talented employees working in functional divisions are selected to join the quality team in which they can lead Six Sigma projects for 2 years. After the 2-year experience those employees are usually promoted to a higher-level position. As a result, Six Sigma project engagement and black belt and master black belt certifications have been regarded as a next step for career advancement, even though the firm does not officially require Six Sigma belt certifications for promotion.

At American Financing, as the conceptual principles behind Six Sigma have remained intact, the social dimension of the original Six Sigma template could also be maintained without much adaptation. This in turn results in little demand for major modifications of the technical dimension. As a result, while there have been some ups and downs in terms of how rigorously Six Sigma teams follow the technical dimension, mostly depending on the top manager's style in a given time period (according to an interviewee at American Financing), the basic methodology and tools have remained almost the same as in the original Six Sigma template.

Table 2 shows interview quotes from managers at American Financing that support our observations.

Theory-building

We have thus far described the process of Six Sigma adaptation observed in Seoul Financial and compared the observations with those in American Financing. Based on these observations and comparisons, we build a process model of adaptation.

First, we observe a cascading sequential pattern to the adaptation. Our observations suggest that when a practice is adopted and implemented in a new setting, adaptation of the practice is initiated by how the practice is conceptually framed. Every adopting environment has its unique context, both at the level of the firm and at the larger societal level. Seoul Financial was operating in the context of the nationwide innovation movement happening in South Korea at that time, and of the Seoul Group's aspiration to become a globally competitive firm. These contextual factors pushed the firm to introduce Six Sigma as a tool for firm-wide innovation and not just for process improvement. With this background to the adoption, there was misalignment between Seoul Financial's goal of spurring innovation and the conceptualization of the original Six Sigma template (which emphasizes process improvement and customer satisfaction). The firm's unique framing of Six Sigma as "management equals to innovation, which equals Six Sigma" right from a very early stage in the implementation process was driven by the context.

The early adaptation of the conceptual framing of Six Sigma created the emergent condition that, in order to achieve innovation across the whole firm, every organizational member from top to bottom and in all business and functional units had to participate in the innovation movement. This

Table 2 Interview quotes from managers in American Financing

Dimension	*Quote*
Conceptual dimension	"First and foremost [among important features of Six Sigma] is that it brings customers to the forefront. Today, why we leverage Six Sigma is to be able to improve the areas that customers ultimately 'feel', at least for our business. This is very important. And what we understand [about] how the process performs is the tools to improve customers' experience with us". "Historically, customers always told us what we should be working on. We have found in the past that, when we work on those things, we do a great job of making improvements and engaging customers along the way. They [the customers] will continue to give us their business and subsequently, are much more willing to grow with us. As they are growing, we are growing. Ultimately, that's our own growth strategy". "For me, Six Sigma is really about process improvement. It is a set of tools by which an individual can go and understand how each process is performing to the very detailed level, including what the important issues are and why this process is not performing at the level that you want it to be".
Social dimension	"In a week, they [team members] contribute to the project in an hour or two. There are 10 to 15 members in a project. Only one or two are full time, and the rest of them are part-time members. On the low end, three to four functions are working together; at the high end, there can be six to eight functions working together. Interactions between the six or so functions are chain relationships: so all the six functions are not making impact all together, but one or two functions are tied together, making impacts on one another. Once a week I bring all the members together [to share the project status]". "There are challenges in cross-functional work. The way functions are designed is that you make sure [there are] checks and balances in conflicting interests. So, there is a sales department that is pushing for more sales and is measuring time, and there is a credit business, especially landing business that cares about bad credits. So, you meet a conflicting design issue. We do have those conflicts, but we want to make that [into] healthy competition between functions. What we do is to have a neutral party, which is the quality team, and make sure employees have business goals, not just functional goals". "Facing the conflicts between different areas, I tried to show the conflict to the people who are siloed over here. They are doing what they are doing in the silo [for] all the right reasons. So, the reasons are hard to debate. They are experts who are working on the process for 20 years. They found most of the process improvement from their style and their points. But you have to show them the larger objectives because there is usually something in their process to accomplish something for the larger goal. But if you want to change them for the larger goal, you have to get them understand that this is what they need to change".
Technical dimension	"For the most part, we have pretty much consistently followed the DMAIC steps". "In this business, to get you certified, you have to take the training, complete the test, and you have to complete two projects that have followed all of the DMAIC process. So, it is in everyone's best interest to make sure they follow this because if you are not following the process, the quality team would not want you to be certified". "A big piece of Six Sigma is using data to understand how a process is performing. It is not guess-work. It is [by] having data that we can know what is statistically valid and be able to understand how a process is performing".

requirement, combined with the firm's cultural context favoring hierarchy and authority, as well as the firm's structural context of rigid business units, created further misalignment with the social dimensions of the original Six Sigma template (which emphasizes cross-functional teamwork and selective participation in Six Sigma projects). Seoul Financial adapted the structure of work units and the compensation system to create a hierarchical arrangement of cross-functional work within the rubric of Six Sigma. It aligned senior executives' KPIs with firm-level Six Sigma goals, and created strict formal employee control mechanisms (such as requiring Six Sigma belt certifications for promotion, and providing advantageous scores in performance appraisals to those who complied with these requirements). This adaptation of the social dimension also occurred in the early stages of implementation, almost simultaneously with the conceptual adaptation.

The structural adaptation in turn created another emergent condition and associated misalignment. As Six Sigma in Seoul Financial was applied to all functional areas (as opposed to just selected business processes), not all Six Sigma projects were suited to the use of the methodologies prescribed in

the original template (such as the DMAIC process). Therefore Seoul Financial adapted the original methods and created several different versions for various functional uses.

What might we suggest from the way adaptation played out in this firm? Based on the above discussion, we begin to see a process model of cascading misalignments and adaptations, driven by the larger societal as well as the firm context. The process starts with some conceptual adaptation of the practice, followed by social adaptation, with adaptation of the technical aspects of a practice happening fairly late in the process. Formally, we propose:

Proposition 1: When an organizational practice is implemented in a new adopting environment, conceptual adaptation occurs first at an early stage of implementation. Conceptual adaptation is followed by social adaptation, and technical adaptation occurs at a relatively late stage in the implementation process.

The sequential pattern discussed above suggests that different dimensions of an organizational practice are context-bound to different degrees. In Seoul Financial, while the conceptual and social adaptation occurred at an early stage of implementation, the technical dimension – that is, the modification of DMAIC process – occurred relatively late. This temporal pattern in the adaptation process suggests that the technical dimension is less context-bound. In other words, although organizational members are not used to the new methodology, and it is often difficult for them to cope with new ways of working, they are more open to learning about the technical dimension and more tolerant of any lack of fit there, as compared with the conceptual or social dimensions. This is because the technical dimension by nature contains clear external referents (such as the standard DMAIC roadmap), which minimizes the confusion that might be caused by different meanings across different contextual environments (Rosenzweig, 1994). Based on this discussion, we propose:

Proposition 2: When an organizational practice is implemented in a new adopting environment, the conceptual and the social dimensions of a practice are more significantly influenced by contextual factors in the adopting environment than the technical dimension, especially in the early stages of implementation.

Our case observations also suggest the process mechanisms that drive the adaptation of the practice. First of all, in our case setting, the national context initially shapes the conceptual adaptation of the practice. The cultural and structural orientation of the firm also creates misalignments with the original template, resulting in the adaptation of the social dimension. These observations illustrate the context-dependent nature of organizational practices, and confirm that the larger national sociocultural context as well as the firm's own cultural and structural context significantly affect how a practice is adapted.

More important and interesting, however, is *the cascading nature of adaptation, whereby each adaptation creates further misalignment that drives further adaptations*. In the case of Seoul Financial, the conceptual framing of Six Sigma as a tool for firm-wide innovation created emergent conditions that required different ways of organizing and motivating work units. This resulted in the adaptation of the social aspects of the original template, which in turn created another set of emergent conditions and misalignments that required the modification of the technical dimension. Formally:

Proposition 3: When an organizational practice is implemented in a new adopting environment, the adaptation of any one dimension of the practice creates new emergent conditions and misalignments that can drive subsequent adaptations of other dimensions.

Figure 3 illustrates our theoretical model.

Cross-validation of the Proposed Relationships

Jick (1979: 602) suggests that "organizational researchers can improve the accuracy of their judgments by collecting different kinds of data bearing on the same phenomenon". Yin (1984) also stresses the importance of using different sources of data (i.e., triangulation) in developing a theory using case study methodology. In order to show that the proposed theoretical relationships are not from an idiosyncratic case of a peculiar company, but reasonably represent reality, we cross-validate the proposed theoretical relationships using supplemental data.

First, using publicly available data such as postings on corporate websites, we compare how several selected Korean and US firms (which are well-known for the successful use of Six Sigma in their respective countries) describe Six Sigma in their

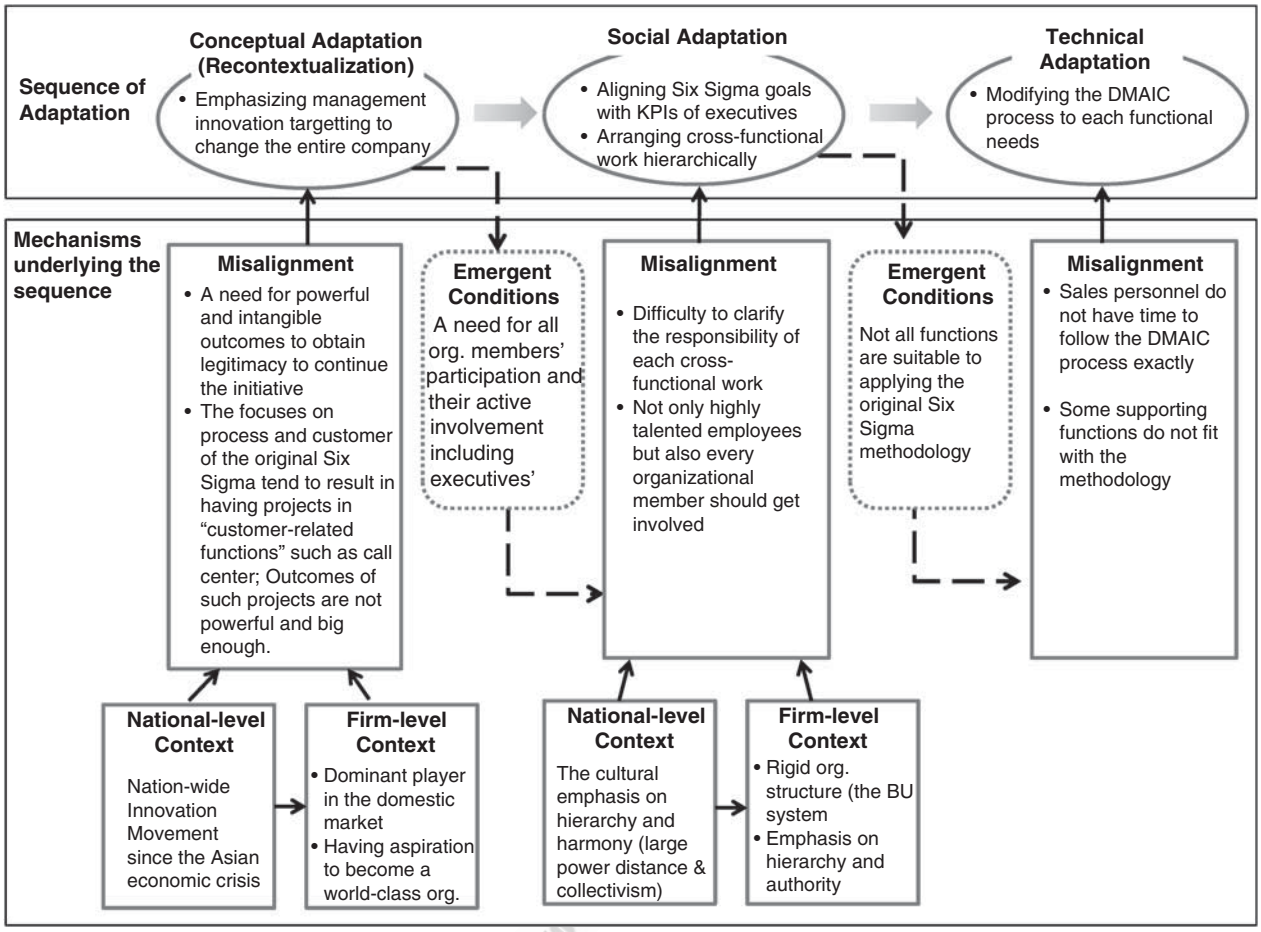

Figure 3 A process model of adaptation of organizational practices.

firms in public announcements. Table 3 summarizes this comparison. The comparison clearly shows that although Six Sigma is understood as a tool for change and innovation in general, the foci are very different between Korean and US firms. Whereas US firms focus more on process and quality improvement through Six Sigma, Korean firms focus more on fundamental innovation across the entire company, which is consistent with our case observation results.

This unique recontextualization (Brannen, 2004) of Six Sigma in Korea is also reflected in two studies conducted by practitioner-oriented Six Sigma institutes in Korea. One study conducted in 2004 reports that among 83 participating firms, 70% of those in the service industry and 50% of those in manufacturing responded that the reason for adopting Six Sigma was to "improve the entire firm's competitiveness", while 17% of firms in both industries answered that it was "to improve the firm's particular operational areas" (Pyo, 2006). Another Six Sigma institute conducted a similar study, and its findings indicate that among 78 participating firms, 55% express that they use Six Sigma as a "management innovation tool" rather than as a "quality innovation tool" (Chung, 2005).

Second, in order to compare how Six Sigma is actually used in firms, we reviewed confidential presentation materials of US firms (obtained by participating in regional Six Sigma focus group meetings for 2 years), a Six Sigma project deliverable at a US firm, and additional interview data with 12 Korean managers in four other Korean firms. These data suggest that, in all of the reviewed US firms, Six Sigma projects are specifically targeted to improve chosen business processes. For example, in a food-manufacturing company producing canned meat products (a Fortune 500 firm), there were 13 concurrent projects geared to "improving pricing process", "reducing damaged/unsellable products", "mastering records", and "forecasting". In all the US firms, cross-functional teamwork was

Table 3 Comparisons of how Six Sigma is described conceptually in selected firms in Korea and in the US

Korean firms	*US firms*
LG Electronics Six Sigma is not merely a statistical tool to improve defect rates. It is an innovation tool that implies our company's business direction for developing corporate culture seeking for efficiency and customer satisfaction. Now, Six Sigma at LG Electronics expanded from operation sites to every managerial area. Through the success of Six Sigma, we have overcome the IMF economic crisis quickly. Six Sigma will become an effective management innovation tool for us to become Global Top 3.	*3M* Six Sigma is an initiative at 3M that is fundamentally improving our business processes, helping us become more customer focused, and strengthening our ability to create and market new products. At 3M, Six Sigma methods are used to analyze and improve the key processes that affect our growth, costs, cash, and customers. The results are faster commercialization and shorter cycle times, increased productivity, improved cost structures, better utilization of cash resources and most importantly higher levels of customer satisfaction.
Samsung SDI (former Samsung Display) Management innovation activities are exerted for a company to be equipped with competitiveness to respond to and lead management environmental changes (market). So far, Samsung SDI establishes "Samsung SDI 6 Sigma Promotion Strategy" by integrating and arranging in-house breakthrough activities, promotes company-wide management innovation activities and continuously expands company competency to lead the digital era. Now, at Samsung SDI, Six Sigma has grown from a simple statistical tool into a management tool and philosophy that changes the way we think and work to eventually maximize customer satisfaction.	*GE* First, what is Six Sigma not? It is not a secret society, a slogan or a cliché. Six Sigma is a highly disciplined process that helps us focus on developing and delivering near-perfect products and services. There are three key elements of quality: customer, process and employee. Everything we do to remain a world-class quality company focuses on these three essential elements. To achieve Six Sigma quality, a process must produce no more than 3.4 defects per million opportunities. An "opportunity" is defined as a chance for nonconformance, or not meeting the required specifications. This means we need to be nearly flawless in executing our key processes.
POSCO Six Sigma at POSCO represents our innovation. It starts from our fundamental evaluation of how we change. Six Sigma is how we face and address challenges to make Global POSCO. Six Sigma at POSCO is a strategy to develop our core competencies, to overcome organizational problems, and to improve efficiency.	*Honeywell* Six Sigma Plus (at Honeywell) is an overall strategy to accelerate improvements in all processes, products and services, and reduce the punitive cost of poor quality through elimination of waste and reduction of defects and variations. One of the ultimate aims documented in the Six Sigma Plus strategy is "Providing maximum value to customers" by applying a logical and structured approach to all business processes.

fundamental to the execution of Six Sigma projects. A summary of a project deliverable at another Fortune 500 food manufacturing firm describes its cross-functional team building process:

> The VP of the Packaging department in R&D took on the responsibilities of a project champion. The Technology manager from the statistics group was selected as a project manager, and a special pack manager from Supply Chain and a research engineer from R&D formed the core team of the project. The special pack manager and research engineer [each] have nearly a decade of experience in special pack, and the project manager has had dozens of experiences on leading project teams. Core team members also established some ground rules for team meetings, such as "Have a regular meeting on a weekly basis", "Be open minded to accommodate all ideas" and "Create action items at the end of each meeting."

In contrast, all the Korean firms that we interviewed used a hierarchical arrangement for cross-functional work. Some firms called such an organizing method a "top-down" arrangement, and some firms called it "cascading of Six Sigma goals". A global steel manufacturing firm in Korea uses the terms *Mega Y* and *Big Y*.[6] Mega Y refers to the firm-level Six Sigma goal that is closely aligned with firm-level strategy, and which the CEO keeps track of, whereas Big Y is the business-unit-level project goal, which an executive-level person is in charge of. Mega Y projects are described as being conducted through cross-functional work across several different business units. However, the actual operationalization of Mega Y projects is very similar to what we observed in Seoul Financial. A manager in

this steel manufacturing company described how Mega Y projects were conducted in this firm:

> For example, in our division, we are working on a Mega Y project for "investment in plant and equipment". In this project, our objective, which comes from CEO's interest and order, is to reduce costs involving such investment. Regarding this objective, we discussed issues and identified several core functional areas which needed to improve in order to achieve that objective. We then designated several owners of each of these functional areas. Then, we decided BB (black belt) tasks and GB (green belt) tasks associated with each of the areas. BB tasks are conducted as a team (led by a black belt in a given functional department). GB tasks are conducted individually.

The close alignment of firm-level Six Sigma goals with their executives' KPIs that we observed at Seoul Financial was commonly observable across the interviewed Korean firms. Additionally, all the interviewed firms use "one person Six Sigma projects" called GB (i.e., green belt) projects in which employees are assigned an individual task linked with an upper-level project (i.e., BB projects). This unique way of organizing cross-functional work in Korea reflects the contextual influences discussed earlier, such as the cultural orientation toward hierarchy and authority. In the survey study conducted by a Korean Six Sigma institute mentioned earlier, getting different departments to cooperate with one another was raised by survey participants as the most difficult challenge in Six Sigma implementation (Pyo, 2006).

Compared with the conceptual and social adaptation of Six Sigma, which shows a somewhat converging pattern across Korean firms, technical adaptation seems less salient. According to the interviews with managers from three Korean firms conducted in the year 2004, none of the firms had adapted the technical dimension yet, although 8 years, 5 years, and 2 years had passed respectively since their initial adoption of Six Sigma. In contrast, in these firms, we observed patterns of conceptual and social adaptation similar to what we had observed in Seoul Financial. The Korean steel manufacturing company did adapt the technical dimension into a modified version of the DMAIC roadmap called Quick Six Sigma (QSS). QSS especially targets the firm's production sites so that production units can also take part in the firm's Six Sigma innovation movement. Reflecting the fast-paced daily business at production sites, QSS lets people at production sites improve any observed problems that seem to undermine the efficiency, safety and quality of production by using Six Sigma toolkits, while allowing some latitude in following each of the DMAIC steps. In this firm, QSS was launched in 2006, 3 years after the initial adoption of Six Sigma, while the social adaptation occurred much earlier. Managers in this company describe the process of adaptation that they undertook as follows:

> Looking back, I think that we could do better if we had some flexibility in applying DMAIC. There certainly was a waste of time and energy in applying those steps to any work, where it may not necessarily be applicable. We just followed what the American consultants said. But … it was inevitable. How can you dance when you are not even able to walk?

As thus far reviewed, our supplemental data thus support our claims of the sequential pattern of the adaptation, the different degrees of contextual influence on the conceptual and social dimensions vs the technical dimension, and the impact of the adaptation of one dimension on the adaptation of other dimensions.

DISCUSSION AND CONCLUSIONS

In this section we discuss the adaptation process we observed further by comparing our model with findings from previous studies. The limitations of this study are also discussed. We then conclude this paper by discussing implications for theory and for practice, and especially for the strategic transformation of Asian businesses as they face global competition. Asian firms with global aspirations often look to implement management practices that have been successful in the West in their own operations, and our study provides guidance to managers on how they should approach the adaptation and replication of imported practices in their own environments.

Overall, our model highlights a sequential pattern to the adaptation of organizational practices. We observe that how a practice is initially conceptualized affects how the social dimension is adapted, which subsequently influences how the technical dimension is modified. These sequential and mutual influences among different dimensions arise through the adaptation of one dimension creating unexpected emergent conditions in the adopting context and subsequent misalignment with the other dimensions. This sequential pattern is similar to what scholars holding the structuration view observe in terms of how an initial interpretation of a technology shapes subsequent processes of structural adaptation (Barley, 1986; Orlikowski et al., 1995). In a similar vein, Brannen (2004)

argues that, depending on local contexts, the same practice or products can deliver different meanings in each adopting environment. For example, in her discussion of Disney's theme park internationalization to Tokyo and Paris, Mickey Mouse was conceptualized as a cute character in Japan, as the Japanese were familiar with similar characters such as "Hello Kitty". In France, on the other hand, Mickey was represented as more cunning, because of a French comic book using Mickey as a detective (Brannen, 2004). Scholars have argued that understanding such recontextualization (i.e., "how meanings shift and change in differing contexts") is very important in studying practice implementation, because the way organizational members understand and perceive a given practice affects their acceptance of it, and therefore can determine the success or failure of the implementation (Brannen, 2004; Klein & Sorra, 1996; Reger et al., 1994). Our study extends this understanding by showing that the initial conceptual framing of a new practice is a critical component in the implementation of a new practice, not only because it affects organizational members' acceptance of or resistance to the practice, but also because it influences how subsequent adaptation of the practice unfolds.

The cascading sequential pattern of adaptation that we find also sheds lights on why adaptation is difficult to manage. Because organizational practices are multidimensional by nature, and because those dimensions are often intertwined, the adaptation of one particular dimension in order to enhance fit with the environment can interfere with the consistent application of other dimensions of the practice. For example, if Seoul Financial had conducted only the adaptation of the social dimension – that is, modifying how cross-functional teamwork is undertaken – without adapting the original Six Sigma template methodology, the use of the original methodology would have hardly been effective, because the assumptions or conditions upon which the effectiveness of the original methodology was based would have been altered. This argument suggests that the adaptation process be interpreted as a long-term configuration process to achieve the appropriate fit with the external context as well as achieving internal consistency (Whittington & Pettigrew, 2002; cited in Sinha & Van de Ven, 2005: 397).

Second, our model also suggests that different dimensions of organizational practices are affected by contextual factors to different degrees. There have been a number of studies highlighting contextual influences on organizational practices (e.g., Kostova, 1999; Kostova & Roth, 2002), but few studies have discussed the different degrees of contextual influence on different dimensions of a practice. This understanding provides some insights into why the international management field has observed contrasting arguments about the impact of adaptation on implementation outcomes. As reviewed earlier, depending on the theoretical orientation of researchers, adaptation has been understood as either enhancing or prohibiting the implementation of a new practice. Our theoretical model raises the possibility that these contrasting views and associated research findings can be an artifact of the practice characteristics that a given study focuses on. For example, studies arguing for adaptation tend to focus more on organizational practices that encompass extensive social interactions among different individuals and teams, such as quality management practices (in Kostova and Roth's (2002) study) and human resource management practices (in Beechler and Yang's (1994) and Rosenzweig and Nohria's (1994) studies). Given that such practices heavily involve social interaction, they are likely to be influenced by organizational- and national-level contextual factors. In this regard, adaptation can substantially reduce the potential confusion, difficulty and coordination costs incurred by incompatibility between the new practice and the existing context.

In contrast, studies reporting the negative impact of adaptation tend to focus more on work manuals that specify what a particular individual needs to do in a given time frame, which is similar to what we call the technical dimension. For example, Szulanski and Jensen (2006) used the "52-week plan" for local franchise network growth as the focal practice on which to observe the impact of adaptation. In their recent study arguing for the importance of adhering to the original practice (i.e., template in their terminology), Jensen and Szulanski (2007) focused on sales manuals proven to be "best practice" that specifies a sales person's sales process. Of course, these manuals involve a certain level of ambiguity and subjectivity, and thus are not easy to follow exactly. However, the action and decision items specified by these manuals are basically targeted to help an individual make decisions and take appropriate actions. Because they provide a clear external referent, complications caused by contextual differences are limited.

Furthermore, given that these manuals provide a specific action guide for what to do in order to accomplish a given objective in a given time frame, adaptation in this respect can be harmful, especially when it occurs in the early implementation stages, by losing the external referent that helps to diagnose a situation (Szulanski & Jensen, 2006). This discussion suggests that one should be careful about drawing conclusions about the impact of adaptation, because such an inference can be bounded by the focal practice's characteristics or by whether the observed practice has more of a social or a technical dimension to it.

Further, our model provides some insights into the notion of mutual adaptation (Leonard-Barton, 1988; Van de Ven, 1986), especially in the international management context. Organizational structure and culture have long been studied as influencing innovation. Scholars have argued that, while implementing a new practice, organizations experience mutual adaptation of both structure and practice through ongoing interactions (Leonard-Barton, 1988; Van de Ven, 1986). In our case study setting, the Korean firm's business unit system, with the executives' key performance indicators and its particular emphasis on hierarchy and authority, resulted in the adaptation of cross-functional teamwork and the incentives for employee participation, rather than changing its organizational structure and cultural orientation to fit the newly introduced practice. This observation highlights that, particularly in the international management context, because organizational structure and culture are deeply influenced by the national context (Lincoln et al., 1986), in the short run they are less amenable to adaptation. Therefore the adopted practice tends to be adapted to the local structure and culture, rather than the local structure and culture being adapted to the new practice, at least early on in the implementation. Especially when the social dimension of a new practice demands significant changes to the distribution of power, status, and rewards in an adopting firm, organizational members tend to have substantial difficulty in accommodating the new practice (Bhagat et al., 2002). Thus the social dimension of the practice in particular is more prone to be adapted to the local environment in the early stages.

There are some limitations to this study. Although we cross-validate our model using our supplemental data, our theory is drawn from observing only a pair of firms that have successfully adopted and implemented Six Sigma. Therefore the generalizability of the propositions would benefit from further empirical studies. Also, while our supplemental data show the converging pattern of a practice across different firms within a country, it does not effectively show firm-level differences in implementing and adapting a practice. In order to observe firm-level differences of the adaptation process in further detail, additional in-depth case studies with multiple firms in various national contexts will be needed. Lastly, the findings are based on the interviewees' retrospective memories about their implementation and adaptation processes. Although the interviewees very vividly recalled their experiences from the beginning, longitudinal studies with real-time data would effectively supplement the current study, as well as current knowledge in the field.

Despite these limitations, the current study makes significant contributions to the international and strategic management literatures. First, our theoretical model extends the field's current understanding by moving the research focus from the relationship between adaptation and its outcomes to the mechanisms involved in the process of adaptation. Our model specifies different dimensions of an organizational practice, the national- and organizational-level contextual factors involved in each stage of implementation, and the sequence of adaptation of the conceptual, social and technical dimensions to achieve the best-possible configuration among these dimensions. Given that there have been few theoretical frameworks available related to the adaptation process, our study significantly extends the previous knowledge base by providing an in-depth understanding and rich explanation of how and why adaptation occurs especially across borders.

Second, this in-depth understanding about the adaptation process provides helpful insights into how to resolve the contrasting arguments in the extant literature about the impact of adaptation on implementation outcomes. Our model suggests that *adaptation and exact replication* of a given practice are *not competing nor are they mutually exclusive*, but they are substantiating mechanisms that can support each other for successful practice implementation. In other words, the conceptual and social dimensions are more likely to be affected by the context, and thus can be adapted at an earlier stage of implementation. While the conceptual and social dimensions are locally adapted, the technical dimension can be maintained in its original form, since it is less vulnerable to the local

context. Moreover, given that the maintained technical dimension specifies what to do in a given time frame, it can enable managers not to lose focus and to be able to benchmark implementation against global standards, while still adapting the other dimensions. This view is similar to Williams' (2007: 867) recent argument that knowledge (or practice in our study) display a "dual nature in that it is both ambiguous and context-dependent". Subsequently, Williams (2007) argues that both adaptation and exact replication (not either/or) play a positive role in knowledge transfer.

Our model also suggests that diverse theoretical perspectives can be embraced to study various phenomena related to the adaptation of organizational practices. To date, the cultural and institutional perspectives have highlighted the context-dependent nature of organizational practices, whereas the knowledge-based view has focused on the practice's knowledge characteristics, such as causal ambiguity and *ex ante* uncertainty. In addition, we highlight the multidimensionality of organizational practices, and describe the need for sequential adaptation and configuration of those dimensions. In this respect, the organizational *configuration perspective* can provide an opportunity to revisit the strengths and weaknesses of the two existing perspectives in the literature, and provide additional insights into building more comprehensive models of the adaptation process.

Our study provides practical insights for managers as well, and particularly for managers of late-globalizing Asian firms. To these managers, we stress that neither a precise copy nor massive adaptation alone can contribute to successful implementation. Rather, managers should understand the characteristics of organizational practices such as their multidimensionality and context dependency, and implement the adaptation process with careful consideration given to temporal and configurational issues. This study also suggests some important managerial interventions to be considered during the implementation of a new practice. For example, actively managing organizational members' initial conceptual framing of a given practice is critical, as it significantly affects the subsequent adaptation process. Also, given the different degrees of contextual influence on the conceptual and social vs technical dimensions, managers would do well to align the conceptual and social dimensions of a practice with national cultural and institutional norms early, whereas they should move more slowly on changing the technical dimensions of a practice. While delaying the adaptation of the technical dimension, organizational members can learn how to use the new tools and methods through a process of trial and error. Based on this learning, managers are able to evaluate the effectiveness of individual tools and methods in their own environments, and to eliminate some redundancy and inefficiency caused by overuse of these tools and methods at a later stage.

In addition, by providing a concrete example of how a South Korean firm adapted Six Sigma and made it work, our study shows that managing the adaptation process requires long-term commitment and substantial resources. Drawing on this peer company's experiences, managers particularly from other Asian "late movers" may be able to strategize their approach to managing the adaptation process, as they implement so-called "advanced practices" borrowed from overseas.

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NOTES

[1]Although Six Sigma originated in Motorola, we do not define the Six Sigma of Motorola as the original practice, in that Six Sigma is now perceived as public knowledge. Furthermore, Six Sigma in Motorola has evolved, and has been adapted to its own contexts, as well.

[2]We have verified the validity of this definition of the original Six Sigma template by asking all of our interviewees (all of them were Six Sigma experts) about this selection.

[3]Because of confidentiality agreements, we are using pseudonyms to indicate participating companies.

[4]Six Sigma Glossary (from www.isixsigma.com):
Champion: Business leaders and senior managers who ensure that resources are available for training and projects, and who are involved in project tollgate reviews.
Black Belt: Black belts are knowledgeable and skilled in the use of the Six Sigma methodology and tools. Black belts coach green belts, and receive coaching and support from master black belts
Master black belt: Master black belts are Six Sigma Quality experts who are responsible for strategic

implementation of Six Sigma within an organization. Master black belts' main responsibilities include training and mentoring of black belts and green belts. *Green belt*: An employee of an organization who has been trained in the improvement methodology of Six Sigma and will lead a process improvement or quality improvement team as "part" of their full-time job.

[5]We will share this protocol upon request.

[6]*Y* is the term that Six Sigma participants frequently use to indicate the ultimate project goal, reflecting $Y=f(x)$.

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