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# Realizing IT Strategic Alignment and Business Performance: An Integration of Three Perspectives

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# REALIZING IT STRATEGIC ALIGNMENT AND BUSINESS PERFORMANCE: AN INTEGRATION OF THREE PERSPECTIVES

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## Abstract

*IT strategic alignment remains a key concern for business executives over decades. Unfortunately, prior empirical studies tend to ignore the relevance of cultural and capability dimensions to IT strategic alignment. Consequently, whether IT-related orientation and capabilities are adequate for attaining organizational goals and leading to business values still requires exploration. This study adopts three perspectives to understand why and how IT strategic alignment can be achieved through IT-related orientation and capabilities in program (i.e. project portfolio), management, and flexibility. This study develops a model to examine the relationships among such IT-related orientation, IT capabilities, IT strategic alignment, and subsequent business performance. Accordingly, seven hypotheses were proposed and the model was tested with Partial Least Square technique based on the data collected from a survey of 209 manufacturing firms in Taiwan. The results support our model with seven hypotheses confirmed. By focusing on relevant IT-related orientation, IT capabilities, and IT strategic alignment, this study extends the literatures on program (project portfolio) management, IT capability, and strategic management by manifesting the effects the studied constructs from the bridging, transformative, and adaptive perspectives. Implications of the results are provided and limitations and future research directions are discussed.*

*Keywords: program, capability, flexibility, strategic alignment.*

# 1 INTRODUCTION

While having received plentiful research attentions over the past two decades, IT strategic alignment remains an issue of top priority for IS researchers and practitioners (Tallon & Pinsonneault 2011; Luftman & Ben-Zvi 2011; Preston 2014). As IT function plays a more critical strategic role in competition, IT strategic alignment has also become a greater concern for business executives and been ranked as the most important issue faced by IT executives (Avison et al. 2004). Such alignment, recognized as the extent of fit or congruence between IT strategy and business strategy, has also revealed its positive effect on business performance (Baets 1992; Chan et al. 1997; Kearns & Lederer 2001; Croteau & Raymond 2004; Chan et al. 2006; Celuch et al. 2007; Kearns & Sabherwal 2007; Chang et al. 2008; Johnson & Lederer 2010). Earlier academic efforts on examining IT strategic alignment are about strategic alignment model (SAM) (Henderson & Venkatraman 1993; Avison et al. 2004). Similar models have the merits in recognizing the alignment with the multi-domain and multi-component nature in a holistic perspective. Filling the gaps between business and IT domains, as well as between strategy and infrastructure domains, substantially realizes IT strategic alignment. In these modelling, a domain consists of several components for achieving alignment. Such a perspective also pinpoints either business domain or IT domain as the anchor domain (i.e. the domain which sets the direction of alignment) to explain the existing notions of the business-driven and IT-driven initiatives of alignment. However, due to the components in these domains being general concepts and remaining underdeveloped (i.e. scope, competencies, governance, architecture, processes, and skills), empirical investigation for the line of study is difficult. Despite some prior studies has identified certain enablers and inhibitors of IT strategic alignment, guidance on how to achieve such alignment demand further investigation (Avison et al. 2004). Even though diverse antecedents of IT strategic alignment have been explored in many empirical studies (Tallon & Kraemer 1999; Kearns & Lederer 2001; Hussin et al. 2002; Chan et al. 2006; Kearns & Sabherwal 2007; Preston & Karahanna 2009), essentially highlighting executives' involvement and their knowledge sharing, there still lacks suitable perspectives to give a more coherent picture of the factors that facilitate IT strategic alignment. Such perspectives would be definitely helpful for theorizing the antecedents of IT strategic alignment, as well as justifying the legitimacy of specific practices. Neglecting the potential cultural dimension and capability dimension also limits the added opportunity to improve chronic IT strategic alignment substantially. Prior literatures show that rare researches understand about how organizations actually can achieve alignment in practice (Smaczny 2001; Preston & Karahanna 2009). Further, IT professionals often know precisely what they are doing technically, but rarely understand what their practices means to business strategies. As a result, it remains unclear whether the favored IT-related orientation and IT capabilities are adequate for attaining organizational strategic goals and thereby leading to greater business value. To address this question, we propose program (i.e. project portfolio) orientation, IT management capability, and IS flexibility as the critical factors toward IT strategic alignment from the bridging, transformative, and adaptive perspectives. We focus on these factors because they are readily applicable and actionable for IT professionals.

Overall, this research examines whether IT-related orientation and capabilities would affect IT strategic alignment and the subsequent business performance. Specifically, this research attempts to answer the following questions: (1) whether IT strategic alignment contributes to business value; (2) why and how common but relevant IT-related orientation and capabilities facilitate IT strategic alignment; (3) what are the potential meanings among the relationships of such IT-related orientation and capabilities. Accordingly, our research contributes to the literature with: (1) the development of specific theoretical perspectives for IT strategic alignment; (2) the increased understanding for the effects of the rarely-examined program orientation and IT management capability on IT strategic alignment.

The remainder of this paper is arranged as follows. We first discuss the theoretical foundations of our research and then develop the research model and the associated hypotheses. Next, we introduce

our methods for collecting and analyzing the data. After discussing our results and the implications, we assess the limitations of our research and suggest future research directions.

# 2 THEORETICAL FOUNDATION AND HYPOTHESIS DEVELOPMENT

The very nature of alignment is to take whole organization as a system and promote its functional parts to operate toward the same end or a consistent goal. An embodied metaphor of alignment is that all wheels of an automobile efficiently move in a straight line to fit in a driver's goal of movement (Semler 1997). As IT strategic alignment has many pseudonyms (Avison et al. 2004), the most frequently used one is "fit" (Porter 1996). However, the term "fit" actually focuses on the congruent consequence of alignment, neglecting the process of alignment. Despite the rhetoric, IT strategic alignment attracts debates about its nature, reason, and how to achieve (Avison et al. 2004). For example, some researchers suggest that IT strategic alignment is not a real issue because strategy in its broadest sense is all about alignment between internal resources and external environment (Smaczny 2001). Besides, too tight an alignment or fit between IT strategies and business strategies may also reduce strategic flexibility (Jarvenpaa & Ives 1994; Benbya & Mckelvey 2006; Tallon 2007; Chen et al. 2010). Still, rarely have studies focused on how organizations achieve alignment. Instead, prior studies tend to rely on the assumption of mechanistic organizations enabling alignment (Smaczny 2001). This study therefore focuses on how IT strategic alignment can be achieved. We thus propose some explanatory perspectives and their representative constructs, corresponding to IT-related orientation and capabilities, to address the research issue.

The first perspective is the bridging perspective. This perspective suggests that when an organizational orientation is considered theoretically as having the bridging effect to facilitate communications between IT function and business functions, this orientation could lead to better IT strategic alignment due to the shared understanding of strategic goals. Such bridging mechanisms could be tangible, such as some artifacts, as well as intangible, such as organizational culture, norms, and routines. Due to its inherent nature, implicit knowledge (e.g. values, vision, and strategy) is difficult to be articulated, understood, and transfered across organizational units. This difficulty becomes worse when more organizational unit and members are involved in the knowledge sharing or transfer. This is also a problem for organizations when they implement multiple, interrelated IT projects together, and the collection of the projects is often called a program. By extending project management, program management has been widely used to implement the strategies of organizations (Pellegrinelli & Bowman 1994; Morris & Jamieson 2005; Pellegrinelli et al. 2007). Program management has been recognized as a group of interrelated projects coordinated together as a program in order to achieve desired outcomes and realize common benefits (Haughey 2001; PMI 2006; OGC 2007). Although the idea of program management originates from portfolio management in financial investment area, the purpose of program management focuses on maintaining project goals as congruent with business goals, distinguishing from the risk-diminishing purpose of the latter one. For our study, we adopt the term "program orientation" to accommodate the idea of program formation within program management. Program can be viewed as a mechanism that bridges the gap between project delivery and organizational objectives by promoting communication and coordination among projects. Thus, programs can deliver strategic benefits that may not be delivered by uncoordinated projects in isolation (Ferns 1991; Lycett et al. 2004; Artto et al. 2009). In addition, the firms that implement program-based initiatives are likely accompanied by establishing a program office to institutionalize associated activities. Such a revamped organizational structure, likely attributing to organizational innovation, provides a more tangible arena for handling IT/business strategies and paralleling project affairs holistically with a coordinated manner. Thus, program plays a bridging role by communicating and coordinating strategic goals, facilitating IT strategic alignment.

The second perspective is termed the transformative perspective, signifying that when an IT-related capability is considered theoretically as intending to transform tangible or intangible resources into business' strategic value, the capability can lead to IT strategic alignment because of the strategic nature of delivered business value. For example, Markus and Tanis (2000) elaborate the success of realizing IT investments payoff through the processes of ideas-to-dollars, dollars-to-assets, assets-to-impacts, and impacts-to-performance. For clarity, we can think such processes as transforming solution ideas into actions of IT investments, subsequently transforming the investments into various IT resources, in turn transforming these resources into usage, and finally transforming usage into business value. This transformative process pertinently explains the "black box" in the big picture of how IT delivers business value (Kohli & Grover 2008) in practice. As there is a contemporary trend that firms have been increasingly engaged in deploying information systems to support and shape their strategic choices (Tian et al. 2010), IT management capability has gained greater importance. Thus, a firm with a high level of IT management capability is likely to both transform IT resources and deliver business value effectively. In general, IT management capability may involve IT planning, decision-making, coordination, and control capabilities. Such capabilities not only help in the major phases of the transformative process but also facilitate IT strategic alignment due to its potential in shaping desired business solutions.

We term the last perspective as the adaptive perspective, denoting that when changing environments demand business strategies to be adaptive, business functions would press IT function to have the capability to deal with changes more flexibly, thus engendering IT strategic alignment. For most firms, the environmental factors outside the organizational boundaries are critical contingencies for business outcomes. As the business environment becomes more dynamic, the strategy literature also focuses more on dynamic capabilities that are more capable of capturing transient opportunities. When firms occupy advantageous positions in static environments, their strategies presumably have a better fit with their environments. However, such a presumption is likely to be invalid in a more dynamic environment. Teece (2009) thus points out that dynamic capability assists firms in achieve evolutionary fit (fitness), referring to how well the capability enables firms to make a living. Such a fit (fitness) is distinguished from ordinary capability's technical fit (fitness), defined as how effectively a capability performs its function. As business strategy pursues continual fit or alignment to their environment, IT function inevitably has to quickly and continuously adapt to the changes in business strategy. IS flexibility certainly is the basis for achieving such adaptability and thereby IT strategic alignment.

Our research constructs are defined as follows. IT strategic alignment refers to the extent of goal congruence between IT strategy and business strategy in a firm. Such alignment also indicates how well IT strategy can support the mission, objectives, and plans contained in business strategies (Henderson & Venkatraman 1993; Chan et al. 1997; Sabherwal & Chan 2001; Chan 2002). In addition, based on the coordination nature of program management, program orientation is defined as an organizational culture that urges program members to pursue the success of individual project in taking care of the shared goal in the program. The content of program orientation is expanded to include program formation. IT management capability refers to the extent to which a firm can manage it's IT resources to deliver business value. This capability is manifested by IT planning, IS decision-making, IT coordination, and IT control. IS flexibility is defined as the extent of the ability of information systems in responding to the changing technology and business environments. Finally, business performance refers to the outcome of organizational operations, manifested by growth, profitability, and effectiveness.

In this study, we examine the relationship between IT strategic alignment and business performance and apply the proposed bridging, transformative, and adaptive perspectives to theorize the antecedents of IT strategic alignment. We also propose and investigate the relationships among the constructs of these antecedents. The direct effect of IS flexibility on business performance is also proposed as the

literature has suggested. Figure 1 shows our research model. In what follows, we develop our research hypotheses.

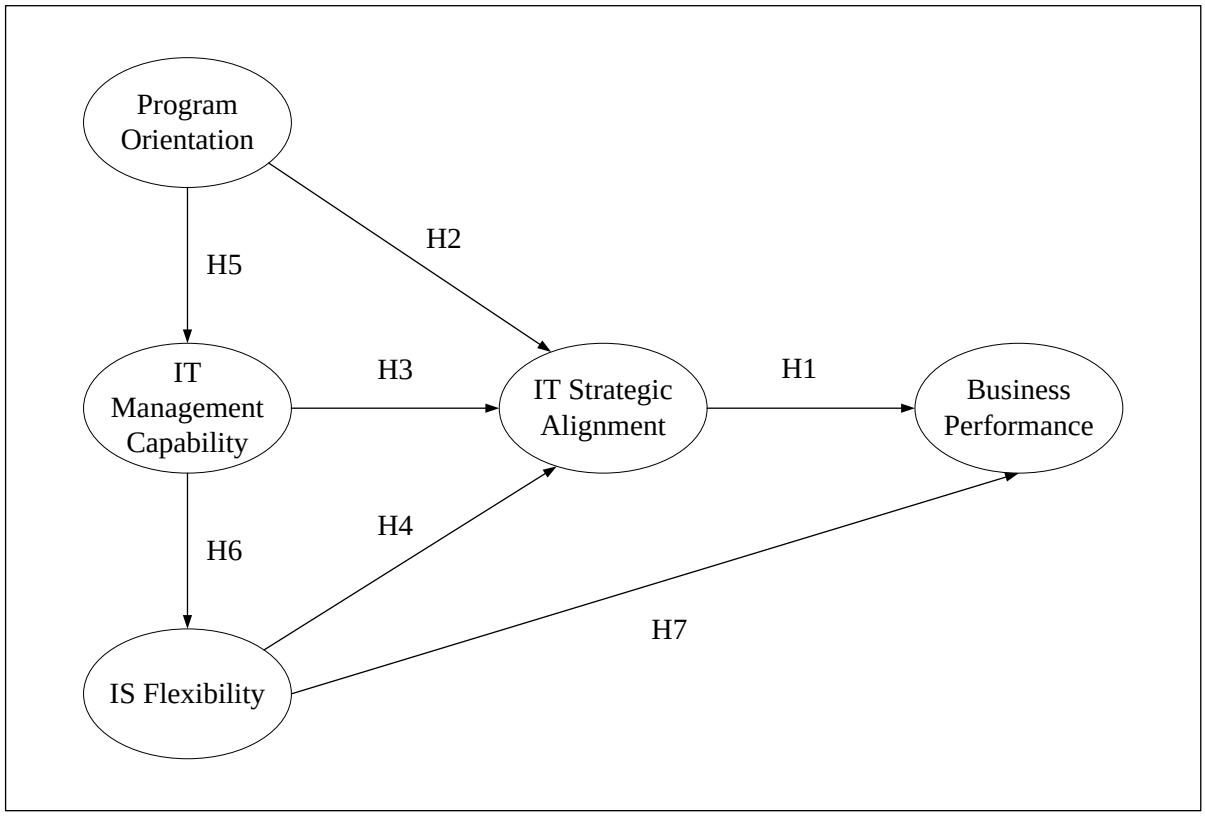


*Figure 1. Research Model*

### 2.1 IT Strategic Alignment and Business Performance

IT strategic alignment could help business performance in two ways. On the one hand, IT strategy generally highlights the optimal IT resource deployment for maximizing stakeholders' benefits. When IT strategy is consistent with business strategic goals, critical IT resources will be dedicated to important areas for addressing business bottlenecks or amplifying business value. Without a certain level of IT strategic alignment, IT resources will be misplaced and substantial business performance will suffer. On the other hand, business strategy frequently requires IT function's support. When a business decision is made without considering IT, there will be a risk of damaging results in business performance (Sauer & Burn 1997). Similarly, when a firm's business needs are not aligned with IT strategy, its competitiveness also suffers (Marchand 2005). Thus, we propose:

*Hypothesis 1: IT strategic alignment is positively associated with business performance.*

### 2.2 Program Orientation and IT Strategic Alignment

Two factors in traditional project-oriented activities can cause misalignment between IT strategy and business strategy. First, the behaviors of IT project members inevitably tend to align with their performance indicators at the project level (Evaristo & Fenema 1999). Second, project members have relatively less opportunity to fully understand business strategies. Most firms hold the presumption of top-down business strategy, but IT strategy against this presumption as IT function grows rapidly and its strategy often emerges autonomously as technology advnaces. Hence, in the project initiation phase, the top-down strategy chain may break. It may be argued that business executives could voice their business strategies in events such as the kick-off (initiation) meetings. However, due to the abstract nature of strategy, it is hard to communicate all aspects of a strategy or

strategy change in rush minutes. In other words, the critical problem that causes misalignment is the failure of extending higher-level business strategy down to the project level effectively. As program is well placed to establish a bridge between project and business strategic goals (Pellegrinelli 2002), program orientation, manifested by program formation and coordination, hence has its advantage in enabling project members to gain a fuller understanding of business strategy. As a result, IT strategy may be better aligned with business strategy (or mutual adjustments arise), and project performance indicators may also reflect business-level performance guideline more fully. Consequently, we propose:

*Hypothesis 2: Program orientation is positively associated with IT strategic alignment.*

### 2.3 IT Management Capability and IT Strategic Alignment

IT management capability involves IT function's capabilities in IT planning, IS decision-making, IT coordination, and IT control. With effective IT management capability, IT departments can better transform their resources according to business needs without harming IT strategic goals while at the same time maintaining congruence with business strategic goals. Because the process of business value delivery is multiple phased at the micro level, effective IT management capability can control the final quality of such delivery, resulting in a better fit between IT strategy and business needs. In addition, with effective IT planning, IT personnel can increase productivity by taking the advantage of information systems to conduct resource transformation more effectively with changing requirements (Brynjolfsson & Hitt 2000), engendering possible IT strategic goal adjustment to business one. Further, when IT departments develop IS toward the internal needs, future-focused decisions enable the combination of IS and IT resources that differs from those of other competitors and becomes imperfectly imitable resources or capabilities (Barney, 1991; Makadok, 2001), supporting the holistic integration of IT strategy and business strategy. Thus, we propose the following hypothesis:

*Hypothesis 3: IT management capability is positively associated with IT strategic alignment.*

### 2.4 IS Flexibility and IT Strategic Alignment

IS flexibility can consist of scalability and adaptability (Sambamurthy et al. 2003; Tallon & Pinsonneault 2011). Scalability, defined as building or acquiring new software into original systems easily and quickly, is an important property of IS to address flexibility (Byrd 2001; Tallon & Pinsonneault 2011). In addition, adaptability is related to whether the data formats are interchangeable and whether the applications can be ported to other systems without translating and redesigning (Tallon & Pinsonneault 2011). As information systems are scalable and adaptable, different IT strategies are easier to implement. The rationale is that information systems can be altered with less efforts and applications can communicate with one another more easily. As such, business strategies can be better supported by IT strategies. With such flexibility that ensures continual support from IS, allowing a higher degree of integration and consistency between IT and business strategies. However, if IS lacks flexibility, achieving IT strategic alignment will be much more difficult (Weill & Vitale 2002). Chung et al. (2005) also suggest that IS with high flexibility can better accommodate organizational changes due to the ability to add, modify, and delete modules quickly with minimum efforts, leading to reduction in the misalignment between IT and business strategies (Chan et al. 1997). Consequently, the following hypothesis is proposed:

*Hypothesis 4: IS flexibility is positively associated with IT strategic alignment.*

## 2.5 Program Orientation and IT Management Capability

Program orientation enables members in different projects to pay more attentions to business goals rather than individual project goals. A firm with a higher program orientation tends to integrate interrelated projects into a program to better ensure that the results of the IT projects satisfy their common business objectives. Hence, the better shared understanding of business goals, the better setting the course of the development of various organizational capabilities, including IT management capability. Besides, a program not only provides a mechanism to set priority and monitor the progress of the projects belonging to the program (Thiry 2004; Milosevic et al. 2007; Wagner & Barkley 2010) but also a bridging mechanism that facilitates effective communication. Decreased communication cost and improved communication quality certainly are helpful for more efficient and effective IT planning, IS decision-making, IT coordination, and IT control, thus resulting in greater IT management capability. Thus, we propose:

*Hypothesis 5: Program orientation is positively associated with IT management capability.*

## 2.6 IT Management Capability and IS Flexibility

With better IT management capability, the firm will have higher possibilities to design information systems more adaptable to changing requirements. Quality IT planning assists in establishing a deliberate IT architecture or an in-house compatible platform that can accommodate various applications. In this way, firms will have great flexibility to expand the number of applications. Having better IT management capability, the firm will also be more likely to make decisions to purchase proper hardware and software to build up and maintain a flexible infrastructure. Further, an IT decision-maker also can choose modularized software or interchangeable data formats to realize seamless connections among applications, allowing the flexibility of expanding applications. Moreover, a good IT decision-maker can equally choose system providers who supply systems with built-in flexibility for unpredictable changes (Ramaraj 2010). Saraf et al. (2007) also note that IT managerial processes enables IS to become flexible. Consequently, we propose:

*Hypothesis 6: IT management capability is positively associated with IS flexibility.*

## 2.7 IS Flexibility and Business Performance

IS flexibility can support firms to quickly respond to changing market demands and improve service quality, thus allowing the firms to gain greater sales growth, financial profitability, and business effectiveness. As an important factor for firm performances (Kettinger et al. 1994), flexible IS in fact can be less expensive to operate in a dynamic environment (Kumar 2004). Owing to the uncertain demands in changing market environments, firms should also pay more attentions to their ability to satisfy those demands dynamically. Without flexible IS, firms could not carry out the demands or do so much additional cost. For example, as firms need to switch business partners quickly, IS flexibility is important because of its influences on lowering the costs of switching business partners (Saraf et al. 2007). Inflexible IS certainly would resist to change, and is difficult to adapt to new market demands and changed strategies (Ray et al. 2005). Byrd and Turner (2000) demonstrate that IS flexibility can support activity efficiency and thus contribute to competitive advantages and accrue benefits to firms. Thus, we propose the following hypothesis:

*Hypothesis 7: IS flexibility is positively associated with business performance.*

# 3 RESEARCH METHODOLOGY

## 3.1 Measurement Development

All measures of the study were adopted from existing measures in the literature to fit the research context. A seven-point Likert scale was adopted, with anchors ranging from strongly disagree (1) to strongly agree (7), and all measurement items are reflective indicators of the research constructs. After compiling an English-language version of the questionnaire, the original questionnaire was translated into Chinese. The survey items then were verified and refined for translation accuracy by an MIS professor and a senior doctoral student. The survey items are provided in Appendix A.

## 3.2 Survey Administration

This study focused on large and medium-sized manufacturing companies in Taiwan and the sampling frame was "Top 1000 manufacturing firms in Taiwan 2010" published by Common Wealth Magazine. The top 1,000 manufacturing firms were selected to distribute our survey. IT managers were chosen as the informants because we believe that senior IT managers should be the most knowledgeable and reliable informants within a company to answer the questionnaire.

A total of 1,000 survey packets were mailed on April 15, 2012 and accordingly 211 surveys were returned with 209 completed surveys for subsequent analysis, yielding an effective response rate of 20.9%. The mailing to each respondent included a cover letter explaining the purpose of the study, the questionnaire, and a self-addressed stamped return envelope. To encourage participation, the questionnaire also noted that the researchers would send a summarized report to the respondent after the research completed if the respondent showed interest in receiving one.

Among the responding firms, 76 percent have less than NT$ 8 billion revenue in 2011. In addition, 80 percent of the firms have less than 20 IT employees and 65 percent have less than 1% IT budget relative to revenue, revealing that the sample mainly consists of medium to large-sized firms in Taiwan. On average, the informants had been in the current position for 6.5 years and in the firm for 11.5 years, indicating the informants should have sufficient knowledge to answer the survey.

## 3.3 Data Analysis

Data analysis utilized a two-step approach as recommended by Anderson and Gerbing (1988). The first step involves the analysis of the measurement model, while the second step tests the structural relationships among the latent constructs. The aim of the two-step approach is to establish the reliability and validity of the measures before assessing the structural relationship of the model. SmartPLS 2.0 M3 was used to assess both the measurement model and the structural model because PLS places minimal restrictions on measurement scales, sample size, and residual distribution (Chin and Newsted 1999).

### *3.3.1 Measurement Model*

The adequacy of the measurement model was evaluated on the principles of reliability, convergent validity, and discriminant validity. Reliability was examined by the composite reliability values. Table 1 shows that all the values are above 0.7, satisfying the commonly accepted threshold. The convergent validity of the scales was assessed by two criteria (Fornell & Larcker 1981): (1) all indicator loadings are significant and exceeds 0.7 and (2) average variance extracted (AVE) of each construct exceeds the variance due to measurement error for that construct (i.e., AVE should exceed 0.50). As shown in Table 2, all items exhibited a loading higher than 0.7 on their respective

construct, and as shown in Table 1, all the AVEs range from 0.66 to 0.82, thus satisfying both the criteria for convergent validity.

| Constructs | Items | Composite Reliability | Mean (STD) | AVE | Adapted Scales |
|---|---|---|---|---|---|
| Program Orientation (PO) | 11 | 0.97 | 5.34 (1.23) | 0.74 | Braunscheidel and Suresh (2009); Hoegl et al. (2004) |
| IT Management Capability (MC) | 11 | 0.96 | 5.43 (1.15) | 0.69 | Kim et al. (2011) |
| IS Flexibility (FL) | 4 | 0.95 | 4.95 (1.27) | 0.81 | Saraf et al. (2007) |
| IT Strategic Alignment (SA) | 4 | 0.95 | 5.39 (1.19) | 0.82 | Preston and Karahanna (2009); Kearns and Sabherwal (2007) |
| Business Performance (BP) | 9 | 0.94 | 4.76 (1.26) | 0.66 | Croteau and Bergeron (2001); Pelham (1997) |

*Table 1. Reliabilities and Average Variance Extracted*

Discriminant validity was assessed by two criteria. First, that the loading of each measurement item on its assigned construct is larger than its loadings on all other constructs will be consider as having good discriminant validity (Chin 1998). Second, the square root of the AVE of a construct should be greater than the correlations between the construct and other constructs in the model (Fornell & Larcker 1981). As shown in Tables 2 and 3, both criteria are clearly met, demonstrating sufficient construct validity of the scales.

| | PO | MC | FL | SA | BP |
|---|---|---|---|---|---|
| PO1 | **0.83** | 0.58 | 0.47 | 0.51 | 0.34 |
| PO2 | **0.89** | 0.67 | 0.51 | 0.59 | 0.36 |
| PO3 | **0.88** | 0.62 | 0.48 | 0.57 | 0.37 |
| PO4 | **0.88** | 0.63 | 0.48 | 0.56 | 0.39 |
| PO5 | **0.87** | 0.67 | 0.51 | 0.57 | 0.33 |
| PO6 | **0.90** | 0.71 | 0.60 | 0.63 | 0.39 |
| PO7 | **0.85** | 0.66 | 0.50 | 0.58 | 0.33 |
| PO8 | **0.88** | 0.68 | 0.53 | 0.63 | 0.39 |
| PO9 | **0.85** | 0.61 | 0.51 | 0.55 | 0.35 |
| PO10 | **0.82** | 0.64 | 0.53 | 0.59 | 0.42 |
| PO11 | **0.80** | 0.59 | 0.52 | 0.55 | 0.36 |
| MC1 | 0.63 | **0.83** | 0.59 | 0.65 | 0.44 |
| MC2 | 0.63 | **0.86** | 0.64 | 0.65 | 0.44 |
| MC3 | 0.66 | **0.83** | 0.65 | 0.71 | 0.45 |
| MC4 | 0.54 | **0.73** | 0.51 | 0.60 | 0.30 |
| MC5 | 0.54 | **0.77** | 0.58 | 0.59 | 0.30 |
| MC6 | 0.58 | **0.78** | 0.55 | 0.61 | 0.39 |
| MC7 | 0.60 | **0.81** | 0.62 | 0.63 | 0.46 |
| MC8 | 0.69 | **0.89** | 0.69 | 0.75 | 0.44 |
| MC9 | 0.65 | **0.87** | 0.66 | 0.66 | 0.42 |
| MC10 | 0.64 | **0.87** | 0.71 | 0.74 | 0.44 |
| MC11 | 0.64 | **0.85** | 0.64 | 0.68 | 0.44 |
| FL1 | 0.48 | 0.63 | **0.87** | 0.63 | 0.39 |
| FL2 | 0.55 | 0.72 | **0.92** | 0.67 | 0.47 |
| FL3 | 0.57 | 0.70 | **0.91** | 0.67 | 0.46 |
| FL4 | 0.55 | 0.67 | **0.91** | 0.69 | 0.48 |
| SA1 | 0.61 | 0.72 | 0.63 | **0.91** | 0.42 |
| SA2 | 0.59 | 0.68 | 0.67 | **0.91** | 0.48 |
| SA3 | 0.64 | 0.75 | 0.71 | **0.94** | 0.54 |
| SA4 | 0.58 | 0.74 | 0.64 | **0.85** | 0.49 |

| | | | | | |
|---|---|---|---|---|---|
| BP1 | 0.40 | 0.46 | 0.47 | 0.48 | **0.85** |
| BP2 | 0.31 | 0.36 | 0.32 | 0.43 | **0.77** |
| BP3 | 0.37 | 0.42 | 0.43 | 0.43 | **0.85** |
| BP4 | 0.32 | 0.38 | 0.43 | 0.39 | **0.86** |
| BP5 | 0.24 | 0.33 | 0.38 | 0.34 | **0.84** |
| BP6 | 0.29 | 0.38 | 0.43 | 0.36 | **0.78** |
| BP7 | 0.35 | 0.36 | 0.33 | 0.44 | **0.76** |
| BP8 | 0.40 | 0.47 | 0.43 | 0.50 | **0.79** |
| BP9 | 0.39 | 0.42 | 0.41 | 0.48 | **0.79** |

*Table 2. Cross Loadings of Measurement Items*

| | PO | MC | FL | SA | BP |
|---|---|---|---|---|---|
| PO | **0.85** | | | | |
| MC | 0.75 | **0.83** | | | |
| FL | 0.60 | 0.75 | **0.90** | | |
| SA | 0.67 | 0.80 | 0.74 | **0.90** | |
| BP | 0.43 | 0.50 | 0.50 | 0.53 | **0.81** |

*Table 3. Correlation among Constructs and the Square Root of the AVE*

### *3.3.2 Structural Model*

In PLS analysis, we examine the structural paths and the R-square scores of endogenous variables to assess the explanatory power of the structural model. Figure 2 shows the results of structural path analysis. Most of paths exhibit as significant with a P-value less than 0.01 except one path with a P-value less than 0.05. The significance of all paths is assessed with 500 bootstrap runs. Overall, the R-square values of the endogenous variables range from 31.1% to 68.9%, suggesting reasonable explanatory power of this model.

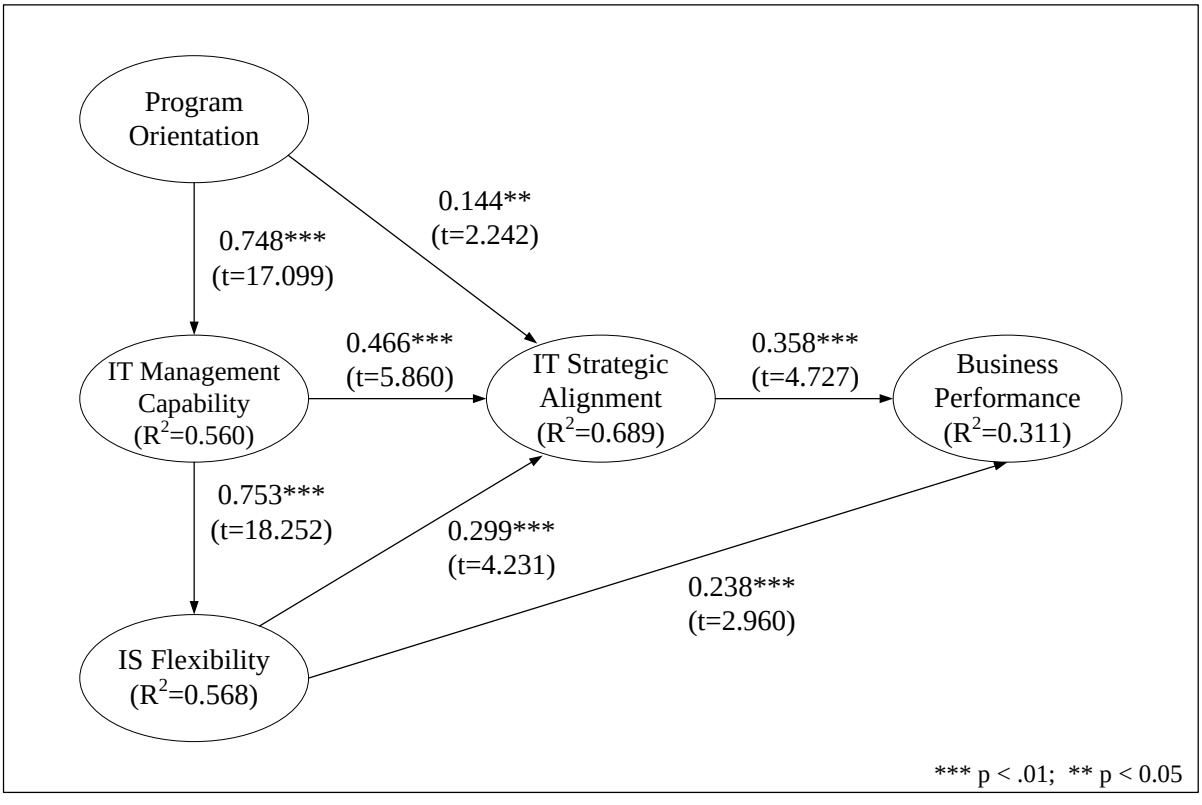


*Figure 2. PLS Analysis of Results*

# 4 DISCUSSION AND IMPLICATIONS

## 4.1 Summary of Results

According to the results in Figure 2, all hypotheses are positively significant as expected. In terms of effect size, the paths to IT strategic alignment are adequate, as well as the path from IS flexibility to business performance. Besides , the proposed relationships among the IT-related orientation and capabilities are quite strong. The result thus suggests that: (1) the three proposed perspectives of IT-related orientation and capabilities toward IT strategic alignment and subsequent business performance are empirically corroborated; (2) because IS flexibility can have a direct influence on business performance without IT strategic alignment, such an IT-related capability might be worth special attentions; (3) program orientation has great potentials in supporting IT management capability, as well as IT management capability in supporting IS flexibility. In fact, program orientation, which can be viewed as a kind of culture or structure, undergirds ordinary organizational capability, such as IT management capability. In the same vein, as IS flexibility acts as a sort of dynamic capability, IT management capability underlying IS flexibility for generating dynamic capability should also be justified.

## 4.2 Implications for Theory

IT strategic alignment has been identified as one of the most important issues in IS discipline for decades (Henderson & Venkatraman 1993; Tallon & Pinsonneault 2011). However, IS researchers often either took ad hoc antecedents or hastily applied existing theoretical perspectives. IS discipline was criticized for borrowing theories from other disciplines and lacking its own theories. As IT strategic alignment is such a critical issue in IS discipline, IS researchers perhaps should address the issue more adequately by integrating or extending useful theoretical perspectives to develop a new relevant theory. Our bridging perspective thinks that shared understanding in communication can result in IT strategic alignment while the transformative perspective underscores that the nature of IT strategies is to deliver business value. Meanwhile, the adaptive perspective gives priority to addressing external pressure than other factors for IT strategic alignment. These three proposed perspectives and their integration for studying IT strategic alignment are preliminary, but should provide a start point for further theorizing and development. Interested researchers may advance or reshape them toward more robust conceptualization and operationalization. In addition, this study also informs IS, organizational, and strategic researchers that contemporary organizations are still restrained from their structures and at the same time require better bridging mechanisms in pursuing effective communication and coordination for implicit knowledge. For example, Kaplan and Norton (1996) proposed balanced scorecard (BSC) as a tool for performance measurement, but later converted it into a mechanism for both communicating organizational vision and embedding strategic goals within key performance indicators (KPIs), establishing a stronger causal link between strategy and performance measurement.

## 4.3 Implications for Practice

According to the results of our study, IT-related orientation and capabilities in program, IT management, and flexibility indeed are helpful for achieving organizational strategic goals and performance. Such outcomes should inspire IT practitioners to continue honing their IT practices. Besides, our study provides several implications for IT practitioners. First, IT professionals generally view program (i.e. project portfolio) as a managerial tool for top-down organizational policy compliance. However, program can be a two-way communication mechanism that benefits IT strategic alignment. We therefore highlight the bridging perspective to justify the critical importance of program-based practice. Second, IT professionals are used to deliver IT solutions for justifying their value in organizations but lack a sense of business strategy. Our transformative perspective thus suggests that discovering the strategic needs of business with IT perhaps is the primary task of IT

professionals, instead of just delivering IT solutions as requested. Third, our adaptive perspective suggests that IT professionals may change their current mindset of providing solutions as requested. When they are simultaneously aware of the environmental pressures, they may play more important roles in assisting organizations to gain superior performance.

### 4.4 Limitations

Our study has a number of limitations. First, the data was collected from a single respondent in each firm with perceptual measures. Multiple respondents may be needed to better rule out the possible common method bias. Second, while our study focuses on the manufacturing firms in Taiwan with IT managers as our target respondents, the study results may not be generalizable to different industrial environments. Third, our variance model tested by data from a cross-sectional survey cannot offer clear-cut causality among the proposed IT-related orientation and capabilities. Longitudinal process models may be more pertinent for clarifying the causality. Forth, as the scale of program orientation is developed by this study, a more comprehensive development may still be needed.

### 4.5 Future Research

Based on the academic and practical importance of IT strategic alignment and IT-related orientation and capabilities, we suggest the following directions for future research. First, academics could advance or modify the proposed perspectives as well as offer other perspectives in order to better theorize IT strategic alignment. Second, investigation of other types of IT practices relevant to business strategies may also deserve more research attention. Third, development of better scales of program-based concepts and IT management capability may also be helpful for advancing our understanding in attaining greater IT strategic alignment.

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## Appendix A: Questionnaire Items

**Program Orientation (PO)** (Braunscheidel and Suresh 2009; Hoegl et al. 2004)

| | |
|---|---|
| PO1 | It is our usual practice that we manage interrelated projects as a program. |
| PO2 | When interrelated projects are grouped into a program, we provide clear common goals for the program. |
| PO3 | We tend to organize interrelated projects into programs with a leader for each program. |
| PO4 | Each interrelated project leader work closely and in harmony to achieve common goals for the program. |
| PO5 | We communicate our business goals across all business functions. |
| PO6 | Interrelated projects are integrated to pursue business goals. |
| PO7 | All leaders of interrelated projects understand how each project can contribute to achieving our business goal. |
| PO8 | Processes and activities were well coordinated across interrelated projects. |
| PO9 | We monitor and coordinate the progress of interrelated projects. |
| PO10 | We had no problems in coordinating interrelated projects as a whole. |
| PO11 | Discussions among interrelated projects are conducted constructively. |

**IT Management Capability (MC)** (Kim et al. 2011)

| | |
|---|---|
| MC1 | We continuously examine the innovative opportunities for the strategic use of IT. |
| MC2 | We enforce adequate plans for the introduction and utilization of IT. |
| MC3 | We perform IT planning processes in systematic and formalized ways. |
| MC4 | When developing IS, we think about and estimate the effect they will have on the quality and productivity of the employees' work. |
| MC5 | When developing IS, we consider and project about how much these options will help end users make quicker decisions. |
| MC6 | In our organization, IS and line people meet frequently to discuss important issues both formally and informally. |
| MC7 | In our organization, information is widely shared between IS and line people so that those |

who make decisions or perform jobs have access to all available know-how.

MC8 In our organization, the responsibility and authority for IT direction and development are clear.

MC9 We are confident that IT project proposals are properly appraised.

MC10 We constantly monitor the performance of IT function.

MC11 Our IT department is clear about its performance criteria.

**IS Flexibility (FL)** (Saraf et al. 2007)

FL1 The manner in which the components of our information systems are organized and integrated allows for rapid changes.

FL2 Our information systems are highly scalable.

FL3 Our information system is designed to support new business relationships easily.

FL4 Our information systems are designed to accommodate changes in firm requirements quickly.

**IT Strategic Alignment (SA)** (Preston and Karahanna 2009; Kearns and Sabherwal 2007)

SA1 The IS strategy is congruent with the corporate business strategy.

SA2 Our business strategy and IS strategy are closely aligned.

SA3 The IT plan aligns with the company's mission, goals, objectives, and strategies.

SA4 We prioritize major IT investments by the expected impact on business performance.

**Business Performance (BP)** (Croteau and Bergeron 2001; Pelham 1997)

BP1 The sales growth position relative to our principal competitors

BP2 The market share gains relative to our principal competitors

BP3 My satisfaction with sales growth rate

BP4 The return on corporate investment position relative to our principal competitors

BP5 The net profit position relative to our principal competitors

BP6 The financial liquidity position relative to our principal competitors

BP7 Relative product quality to our principal competitors

BP8 New product success to our principal competitors

BP9 Customer retention rate to our principal competitors