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ON THE IMPACT OF STRATEGIC PLANNING ON MANDATORY IS INVESTMENTS

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ABSTRACT

Prior research demonstrated that firms invest in IS to create competitive advantage. Nevertheless, many firms are forced to invest in IS to comply with government regulations, regardless if the investment promises competitive advantage or not. A recent example is the Sarbanes-Oxley Act, which required many firms to upgrade their systems. Surprisingly enough, firms sometimes realise that such mandatory investments create competitive advantage. This paper analyses reasons for this phenomenon. We hypothesise that the creation of competitive advantage from mandatory IS investments is facilitated through strategic IS planning (SISP). Our empirical investigation demonstrates that two of three selected SISP methods enable the creation of competitive advantage from mandatory IS investments. The method that does not facilitate competitive advantage differs from the other methods in terms of its scope. Thus, we conclude that the adequacy of SISP methods to unlock competitive advantage from mandatory investments depends on the scope of the methods.

Keywords

Strategic IS Planning, Competitive Advantage, IS Investments, Regulatory Compliance

INTRODUCTION

Firms are affected by various government regulations that have implications for their information systems (ISs) (Braganza and Franken, 2007). For example, many firms have recently been affected by new auditing regulations based on the Sarbanes-Oxley Act (SOX) (Marnet, 2007). Many firms needed to increase IS security standards to achieve SOX compliance (Sipior and Ward, 2007). As SOX compliance is legally required, the related investments are mandatory.

Recent surveys show that firms are increasingly concerned about the high costs associated with mandatory IS investments (Gartner, 2006b). Many firms experience that these investments lead to substantial increases of IS costs that do not pay off because the investments do not contribute to the firms' goals (Strassmann, 1996). These costs are particularly problematic for firms that follow a cost-leadership strategy (Abrahami, 2005). Additional costs are a potential threat to this strategy and hence threaten the competitive position of these firms. Consequently, mandatory IS investments are a big challenge for firms that aim at cost leadership (Ariff, Zubeidah and Loh, 1997).

Generally, there are two approaches how firms can react to this challenge. First, they can follow a reactive approach, and reduce mandatory investments to an absolute minimum. Firms that follow this approach will try to acquire inexpensive hardware and software, and reduce planning efforts through following a 'quick and dirty' tactic. For example, they might limit the number of staff involved in planning, or restrain from planning activities altogether (Garcia, 2004). Second, firms can follow an active approach, and purposefully use mandatory IS investments in their cost-leadership strategy. Firms that follow the second approach attempt to broaden the investment benefits from mere compliance to efficiency improvements and cost reductions (Ghandforoush, Sen and Wander, 1999). Therefore, these firm increase planning efforts, and use planning to identify opportunities how a mandatory investment can support their cost leadership strategy.

The process of identifying these opportunities is referred to as strategic IS planning (SISP) (Byrd, Sambamurthy and Zmud, 1995). Prior research has shown that SISP facilitates the identification of previously unknown opportunities how ISs can be applied in a firm. Hence, it enables firms to realise additional benefits of IS investments (Segars and Grover, 1998). Therefore, theoretically, a firm should be able to use SISP to discover opportunities how mandatory IS investments can contribute to cost reductions. Nevertheless, there is currently no empirical evidence for this assumption because prior studies on SISP do not focus on mandatory investments (e.g. Teubner, 2006; Newkirk and Lederer, 2006). It is conceivable that the system changes that are required for regulatory compliance are different from those changes that result in cost reductions (Garcia, 2004). Besides, as government regulations affect all competitors in a market (Scott, 2006), mandatory IS investments in different firms might be similar, so that firms might not be able to utilise them to distinguish themselves from

competitors. Hence, it is currently not clear if firms that follow a cost-leadership strategy can create competitive advantage from mandatory IS investments when they use SISP.

This study addresses this gap in SISP research and investigates how SISP effects the creation of competitive advantage from mandatory IS investments. We examine a sample of 87 Australian firms that pursued a cost-leadership strategy, and had recently invested in ISs to ensure regulatory compliance. Applying a quantitative approach, we compare if firms which used SISP created a higher level of competitive advantage than other firms. Archival data was obtained from the Australian Department of Communication, Information Technology, and the Arts (DCITA), and bases on a DCITA survey among IS decision makers in Australian firms in 2004.

This study is an initial attempt to investigate the effects of SISP on mandatory IS investments. It contributes to theory because it demonstrates that in addition to previously known SISP benefits, certain SISP methods can also be used to unlock competitive advantage in this special case. However, not all SISP methods are adequate to facilitate competitive advantage. From our results, we conclude that the adequacy of a method depends on its scope. Methods of large scope are more adequate than other methods. This study has practical implications for firms that pursue a cost-leadership strategy, and are forced to invest in ISs to comply with government regulations. Our results provide insights which SISP methods these firms need use to create competitive advantage from these investments.

THEORETICAL FOUNDATION

The theoretical foundation of this research bases on the IS Planning and Investment Model by Henderson and Sifonis (1988) (Figure 1). The model illustrates how strategic IS planning (SISP) ensures that a firm's IS investments are aligned with the business strategy. The business strategy defines a firm's goals. During the SISP process, the firm decides which IS investments are necessary to reach these goals (Henderson and Sifonis, 1988). In a competitive environment, the business strategy is directed at improving a firm's competitive position (Barney, 1991). Through SISP, a firm ensures that investments in ISs result in competitive advantage.

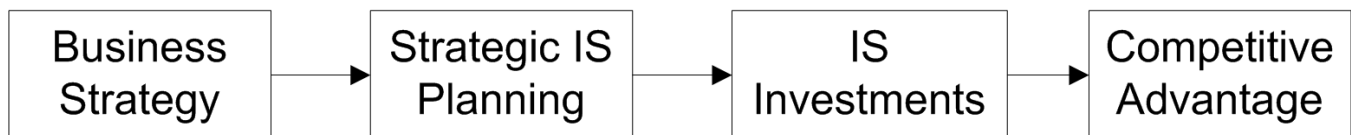


Figure 1. IS Planning and Investment Model

Business Strategy

The business strategy comprises a firm's goals, and an action plan to achieve these goals (Bracker, 1980). Once a firm has determined goals, it generates alternative action plans that specify how the goals can be reached. During the strategy formulation process, the firm assesses the alternative plans, and selects the most promising action plan for implementation. All further activities of the firm follow this action plan and hence contribute to the business strategy (Chaffee, 1985). According to Porter (1985), competitive advantage is achieved through three basic business strategies: Cost leadership, differentiation, and focus.

In the cost-leadership strategy, a firm tries to distinguish itself through the costs of products and services. The firm aims at operating at lower costs than competitors and offering products and services to lower prices. Firms that follow a differentiation strategy distinguish themselves by certain attributes of their products and services, for example, on the product or service itself, the delivery system, or the marketing approach. Firms that follow the focus strategy aim at a particular, usually very narrow segment of a market where there is little or no competition (Porter, 1985).

Strategic IS Planning

SISP is the process of identifying opportunities to use ISs as a means to reach the firm goals that are defined in the business strategy. Further, SISP develops action plans to implement these opportunities (Segars and Grover, 1998). In the course of the SISP process, the firm decides how the currently existing systems can be utilised to support firm goals, and which further components need to be implemented (Lederer and Sethi, 1988). The outcome of the process is an IS portfolio that assists a firm to achieve its goals. Hence, SISP aligns a firm's IS investments with the business strategy.

SISP can be addressed with or without formal methods. While formal methods are usually not beneficial for small SISP processes, they are required for larger processes. Sometimes, firms develop their own formal in-house methods. The development of in-house methods is however cost-intensive, and often requires professional support from outside

consultants. Hence, many firms are not able or willing to develop in-house methods (Lederer and Sethi, 1988). To enable these firms to efficiently address SISP, prior research has developed a range of standard methods that can be used without outside support.

Surveys among practitioners revealed that the most commonly applied methods are business cases, internal contractual arrangements, and post-implementation reviews (Gartner, 2005; Gartner, 2006a). Prior research indicates that these methods are useful to identify benefits from an IS investment (e.g. Lin and Pervan, 2003). Consequently, it can be expected that these methods are adequate to find out how mandatory IS investments can be used for competitive advantage. Therefore, in our further investigation, we focus on these three methods.

A **business case** is a formal summary of benefits that a firm anticipates from an IS investment (Gil-Garcia, Chengalur-Smith and Duchessi, 2007). It is constructed to identify the potential of the investment to contribute to firm goals (Ward and Peppard, 2002). The development of a business case includes the systematic identification of technological artefacts created through the IS investment, an analysis of their impacts on the firm, and an investigation in how far these impacts will be beneficial (Irani, Love, Elliman, Jones and Themistocleous, 2005). Figure 2 shows an example of a business case (Ward and Peppard, 2002).

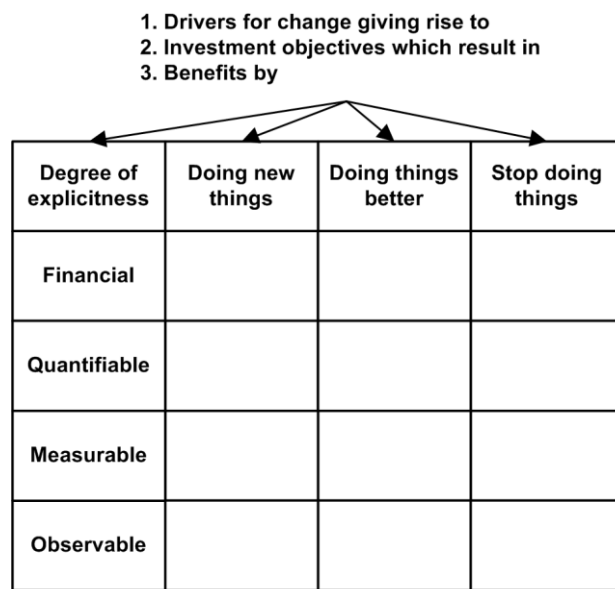


Figure 2. Illustration of a Business Case.

An **internal contractual arrangement** is a formal agreement that defines IS responsibilities of a particular department in the firm, e.g. the production department (Feeny and Willcocks, 1998). These responsibilities include, for example, the systematic identification of IS needs, the documentation of the department’s current and planned ISs, and the report of the department’s IS needs to the IT department (Figure 3). Usually, an internal contractual arrangement is negotiated between a department on the one hand, and top management on the other hand (James, 1999). Firms use these arrangements to manage the SISP process, and ensure that all necessary planning information is available (Wearne, 1985).

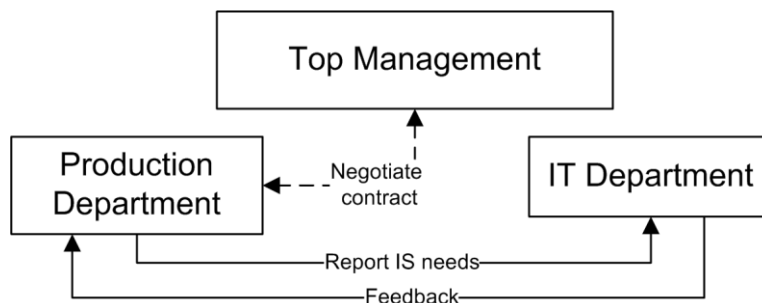


Figure 3. Internal contractual Arrangement for the Reporting of IS Needs.

A **post-implementation review** is a systematic analysis of potential benefits that could have been achieved from past IS investments (Smith, 1989). The analysis determines which of those benefits have not been achieved (Piccoli and Ives, 2005), and if it is possible to still achieve these ‘missed’ benefits through additional investments (Doll, Deng and Scazzero, 2003). Hence, post-implementation reviews determine requirements for future investments (Figure 4). A post-implementation review contributes to the current SISP of a firm in two ways. First, by identifying non-achieved benefits, it reveals investment challenges, i.e. future investment needs that arise from previous investment failures (Lin and Pervan, 2003). Second, by determining how ‘missed’ benefits can still be achieved through further investments, post-implementation reviews expose possibilities how future IS investments can build on previous ones (Gwillim, Dovey and Wieder, 2005). Thus, it becomes possible to downsize future IS investments by building on artefacts that have already been created through previous investments (Brady, Davies and Gann, 2005).

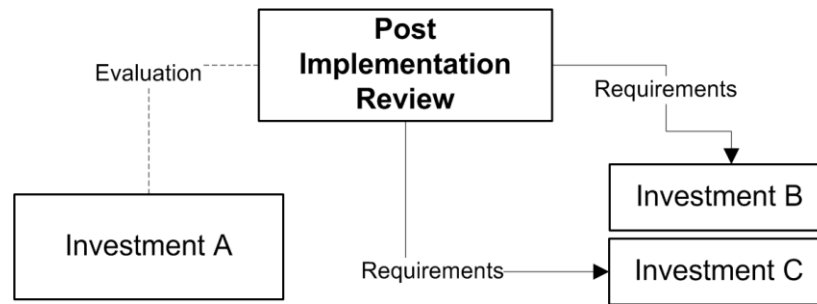


Figure 4. Post-Implementation Review.

IS Investments and Competitive Advantage

The IS Planning and Investment Model illustrates that the creation of IS-based competitive advantage is determined through the business strategy. Generally, a firm creates competitive advantage if it implements a business strategy that creates value, and is not implemented by any current or potential competitor (Barney, 1991). SISP enables firms to identify how ISs can be used to implement such a strategy. Depending on which of Porter’s basic strategies the firm follows, planning activities will concentrate on different aspects of value creation. Thus, the firm will identify different opportunities to use IS investments for competitive advantage.

To be able to pursue a cost-leadership strategy a firm must focus on internal efficiency and minimise process costs (Barney, 1991). Hence, the firm will invest in ISs that increase efficiency and reduce costs. For example, the firm might implement ISs that automate labour-intensive processes (Melville, Kraemer and Gurbaxani, 2004). By contrast, firms that pursue a differentiation strategy focus on product and service characteristics other than price. Hence, they invest in systems that enable them to offer these characteristics (Bardhan, Whitaker and Mithas, 2006). Finally, firms that follow a focus strategy concentrate on one particular market segments. These firms invest in specialised systems that are most adequate for this segment (Arunkundram and Sundararajan, 1998).

THE IMPACT OF SISP ON MANDATORY IS INVESTMENTS

In the information age, firms discover that most government regulations have implications for their ISs. It is estimated that firms spend up to 15% of their IS budgets on regulatory compliance (Gartner, 2006b). Most government regulations require the implementation of a range of IS components (Scott, 2006). These components are implemented over a period of time (Garcia, 2004). Throughout this period, compliance-motivated IS investments occur simultaneously with other investments. Thereby, the investments cannot always be clearly separated (Hu, Hart and Cooke, 2007). A mandatory IS investment is therefore not a one-time discretionary event. Instead, the ambition to comply with a regulation impacts the firm’s IS investments over a period of time. During this period, the regulation can be considered as an external factor that increases the firm’s IS investments.

The IS Planning and Investment Model demonstrates how this factor affects the alignment between business strategy and investments. Normally, a firm first defines its business strategy, then, the firm uses SISP to determine necessary ISs, and finally invests (Henderson and Sifonis, 1988). Hence, SISP ensures that the investments are rooted in the business strategy (Segars and Grover, 1998). However, the government regulation bypasses business strategy and SISP steps of the model and affects the investments directly (Ghandforoush et al., 1999). To ensure compliance, the firm is forced to invest regardless of the business strategy (Braganza and Franken, 2007). Hence, the regulation disturbs Henderson’s and Sifonis’ planning and investment process.

Generally, there are two approaches how firms react to the disturbance of this process: the reactive approach, and the active approach (Figure 5). Firms that follow the reactive approach continue the process, and aim at minimising the disturbance. These firms perceive a mandatory IS investment as an additional expenditure that conflicts with their cost-leadership strategy, and threatens their ability to create competitive advantage (Lazarides, 2007). In order to restore this ability and realign their IS investments with the cost-leadership strategy, these firms minimise the related investments. Hence, they acquire inexpensive hardware and software. SISP activities are also minimised because they are associated with additional costs. Hence, firms avoid formal SISP methods (Garcia, 2004).

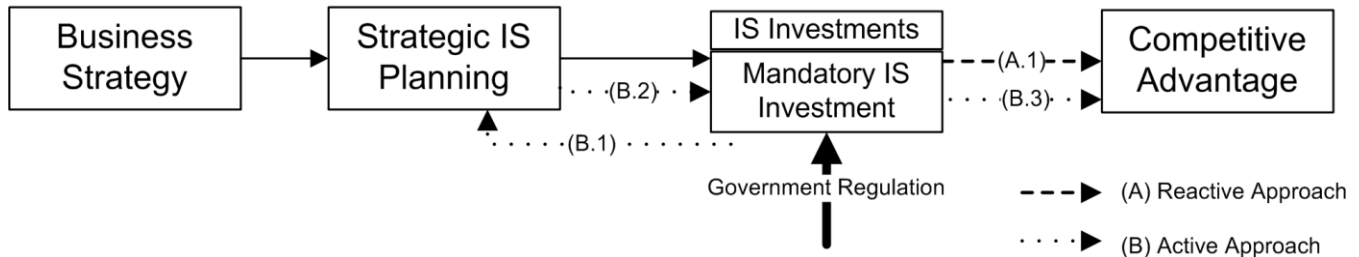


Figure 5. Active and reactive Approach to Government Regulations.

By contrast, the active approach aims at eliminating the disturbance caused by a mandatory IS investment. To reach this aim, firms try to utilise the investment for their business strategies (Hu et al., 2007). Hence, in the case of a cost-leadership strategy, firms need to discover possibilities to use the investment for cost reductions and efficiency improvements. These possibilities can be identified through SISP. Thereby, it is also necessary to review other IS investments in the firm to discover possible synergies (Ghandforoush et al., 1999). Thus, firms are confronted with very complex SISP processes, and need to use formal SISP methods. The active approach is adequate to introducing an iteration in Henderson's and Sifonis' model: Firms go back to the planning step, re-plan major IS investments, and are then turn the investments into competitive advantage (Figure 5).

Experiences from practice show that firms which pursue a cost-leadership strategy prefer the reactive approach (Garcia, 2004). The active approach is avoided because it is perceived to be more risky (Lazarides, 2007). The additional SISP activities during the active approach consume extra resources (Segars and Grover, 1998). Hence, firms are concerned that this approach conflicts even more with the cost-leadership strategy.

Nevertheless, prior research provides hints that this is not necessarily the case. It has been demonstrated that SISP allows firms to realise additional benefits of IS investments (Segars and Grover, 1998). Thus, it can be expected that SISP enables firms to discover opportunities to use mandatory IS investments for cost reductions and efficiency increases. This is particularly true for the three SISP methods discussed above. Business cases allow firms to systematically identify benefits from mandatory IS investments (Atkinson, 1990). Therefore, it can be expected that firms that use business cases are more aware how a mandatory IS investment can support a cost-leadership strategy than other firms. Internal contractual arrangements ensure that the SISP process is based on information about IS needs of particular departments (Feeny and Willcocks, 1998). Hence, firms can easily identify opportunities how mandatory IS investments can be used in these departments. Post-implementation reviews enable firms to identify strategic investment challenges that arise from previous investments (Lin and Pervan, 2003). Therefore, it can be expected that firms which conduct post-implementation reviews discover opportunities to use mandatory IS investments to address these challenges.

In summary, we propose that all three methods enable firms to identify opportunities how a mandatory IS investment can contribute to the business strategy. Assuming that firms which use SISP have the same ability to put identified opportunities into practice as other firms, it can be expected that firms which identify more opportunities will be able to put more opportunities into practice. Hence, it is hypothesised:

Firms that follow a cost-leadership strategy and use

- (H1) business cases
- (H2) internal contractual arrangements
- (H3) post-implementation reviews

for IS investments create a high level of competitive advantage from mandatory IS investments.

METHODOLOGY

We tested the three hypotheses with an archival dataset provided by the Australian Department of Communication, Information Technology, and the Arts (DCITA). In 2004, DCTIA conducted a survey amongst owners, CEOs, and other IS decision makers of Australian firms about their IS investment behavior in the 2003/2004 Australian tax year. During this year, firms were preparing for the SOX regulations that became compulsory in Australia in July 2004. The reliability of the collected data was ensured through a range of pilot studies (Gregor et al., 2004). An SPSS dataset containing all survey responses can be accessed free of charge through the website of the department (DCITA, 2005).

As discussed before, a mandatory IS investment is not a one-time event, rather, the firm's IS investments are influenced by a government regulation over a period of time. Theory provides no hints as to how long this period typically is. For this study, we assume that one year is a good proxy. Hence, we selected firms that stated that their IS investment in the previous Australian tax year had been motivated by government regulations. From the cases that fulfilled this criterion, we then selected firms that stated that they competed based on the price of their products and services. The variables that were used for the selection process are provided in Table 1. The selection process resulted in a final sample of 87 firms.

Selection Variable	Item in Questionnaire	Scale	Selection Criterion
IS investments motivated by government regulations	'Please specify how important/unimportant changes to regulatory and other government requirements were to you as a reason to invest in information systems in the last twelve months!'	1: Extremely unimportant ... 10: Extremely important	Cases >6 were selected
Competitive Strategy	'Does your organisation mainly compete on the price of products and services?'	yes/no	'yes' –cases were selected

Table 1. Variables used in the Selection Process.

The three independent variables in this study refer to the usage of SISP methods. The usage of each method was measured through a single item. The items identify how often the three methods were used (scale: 1[never] to 5 [always]). The measurement instrument for competitive advantage was adapted from Flynn, Schroeder and Sakakibara (1995) who have developed the instrument and tested its reliability. For the purpose of this study, we focussed on the cost-based component of competitive advantage. Hence, competitive advantage was measured through a four-item scale describing in how far firms had experienced cost reductions from IS investments. Applied to our sample of firms whose IS investments are motivated through government regulations, this instrument measures competitive advantage from mandatory IS investments. The measurement instrument is provided in Table 2.

Measurement Item	Item in Questionnaire	Scale
Cost reductions in supply chain management	'Did your IS investments contribute to...'	... savings in supply chain management?'
Reductions in operating costs		... reduce operating costs?'
Reductions in communication costs		... reduce communication costs?'
Avoiding the need in increase workforce		... avoid the need to increase workforce?'
		1: Strongly Disagree ... 10: Strongly Agree

Table 2. Measurement Instrument for competitive Advantage from mandatory IS Investments.

We cannot exclude the possibility that IS-based competitive advantage is affected by factors other than SISP. Therefore, we introduced control variables in our research design (Table 3).

Control Variable	Rationale	Operationalisation
Firm Size	The creation of IS-based competitive advantage is influenced by firm size (Melville et al., 2004)	Only firms with 20 to 200 employees were included
Investment Size	The creation of IS-based competitive advantage is influenced by the size of an IS investment (Melville et al., 2004)	Only investments that exceeded 10.000 AUD were included
Prior IS experience	The ability to create competitive advantage from ISs is affected by the previous IS experience of a firm (Chang, 2002)	Only firms that had used ISs for more than 4 years were included

Table 3. Control Variables.

DATA ANALYSIS AND RESULTS

The following procedure was applied for each of the hypotheses to analyse the impact of SISP on mandatory IS investments. First, the 87 cases were divided into two groups. The first group frequently used the SISP method that was mentioned in the hypothesis (usage score >3), the second group did not (usage score ≤ 3). For both groups, the mean score for competitive advantage was calculated. A t-test was conducted to examine if the means of the two groups were significantly different. The data was nearly normally distributed and therefore, t-tests are an adequate technique to compare means between different groups (Agresi and Finlay, 1999, p. 184).

The data analysis showed that most firms in the study were able to transform mandatory IS investments in competitive advantage. Firms which frequently applied SISP methods created a higher level of competitive advantage from mandatory IS investments than other firms (Table 4). Yet, there were differences between the three investigated methods. Firms that used business cases and post-implementation reviews had a significantly higher mean score for competitive advantage. Hence, H1 and H3 are supported. By contrast, for internal contractual arrangements, the difference of mean scores for competitive advantage was not significant. Therefore, H2 is not supported.

Frequency of SISP method			Mean score for competitive advantage from mandatory IS investments	P-Value (T-Test for equality of means)
Business Case (H1)	Group 1: Frequent usage (>3)	N=32	7.38	0.016*
	Group 2: No frequent usage (≤ 3)	N=55	6.60	
Internal Contractual Arrangement (H2)	Group 1: Frequent usage (>3)	N=39	7.03	0.483
	Group 2: No frequent usage (≤ 3)	N=48	6.77	
Post-Implementation Review (H3)	Group 1: Frequent usage (>3)	N=40	7.33	0.025*
	Group 2: No frequent usage (≤ 3)	N=47	6.51	
* $p < 0.05$				

Table 4. Results of the Data Analysis.

DISCUSSION AND CONCLUSION

The data analysis provided support for H1 and H3, but not for H2. We believe that the reason for these results lies in the scope of the three investigated methods. A business case is a comprehensive summary of all benefits that can be expected from an investment (Ward and Peppard, 2002). Post-implementation reviews analyse the entirety of impacts of previous investments on a firm (Lin and Pervan, 2003). Therefore, business cases and post-implementation reviews are developed with data from all departments of a firm. Hence, within the firm, they can be considered global methods. By contrast, an internal contractual arrangement is negotiated between top management and one department of a firm. Firms rarely ever develop arrangements for all departments (Feeny and Willcocks, 1998). Thus, an internal contractual arrangement can be considered a local method.

Apparently, global methods are more adequate to discover possibilities to use mandatory IS investments for the creation of competitive advantage than local ones. It is assumed that the reason for this observation is the nature of competitive advantage. Firms achieve competitive advantage through their output, i.e. their products and services. This output is produced through the collaboration of all departments in a firm. Hence, a global SISP method could be more appropriate to discover possibilities to use an IS investment for the creation of competitive advantage because it captures the collaboration of various departments. A local approach fails to identify a large number of these possibilities because it focuses on one department, or a limited number of departments. Thus, it cannot fully capture opportunities that arise from collaboration between departments.

This study contributes to prior research on SISP, because it is an initial attempt to investigate the effects of SISP on mandatory IS investments. We demonstrated that in addition to previously known SISP benefits, SISP can also be used to turn a mandatory IS investment into a competitive advantage. Thereby, we extended on Henderson's and Sifonis' IS Planning and Investment Model. We showed that if the process depicted in this model is disturbed by a government regulation, firms should go back to the SISP stage of the process to realign their IS investments with their business strategy, rather than instantly continuing the process. Nevertheless, contrary to our expectations, not all SISP methods support the creation of competitive advantage. Only methods that consider the firm in its entirety are appropriate to align mandatory investments with the business strategy. These findings have implications for firms that pursue a cost-leadership strategy, and are confronted with government regulations like the Sarbanes-Oxley Act that result in mandatory IS investments. We recommend that these firms use global SISP methods like business cases and post-implementation reviews to unlock competitive advantage from mandatory IS investments.

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