Comparing Strategic IT Alignment versus Process IT Alignment in SMEs

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Recently researchers have begun to suggest that the study of IT alignment in SMEs should be based on organizational processes rather than on strategy. This research investigated both approaches in a comparative exploratory study of 38 SMEs in Chile and Colombia. Regression was used to compare both types of alignment against IT success.

The findings did not show significant differences between strategic IT alignment and process-level alignment although the strategic alignment approach better explained the variability of IT success (35.8%) than the process approach (18.7%). This contradicts the findings of recent research which has suggested that alignment models based on SME processes better explain IT success than models based on the company's strategy. Unexpectedly we also found that there was a very high correlation between both types of alignment (0.810). Results showed that strategic alignment could impact the relationship between Process-level alignment and IT success. Our conclusion is that in spite of the fact that few SMEs are involved with extensive and formal long-term planning, there often seems to be an implicit SME strategy that shapes the way that IT is used on processes. Despite the exploratory nature of this study, the unexpected findings may encourage other researchers to validate and deepen the understanding of our conclusions.

Keywords: Strategic IT alignment, Process IT alignment, SMEs, IT Success

ACM Classification: K.6.1 (Project and People Management – Strategic information systems planning)

INTRODUCTION

Understanding the information technology (IT) alignment in companies has produced a large number of studies. However, it must be noted that these investigations have been characterized by two major biases: a focus on the study of strategic alignment to the detriment of other forms of

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alignment (Cragg, Tagliavini and Mills, 2007) and an emphasis on large companies instead of SMEs (Burgess, 2002). These two biases have been criticized by some researchers who claim that IT alignment in SMEs should be studied from a process approach rather than a strategic one. For example, Cragg *et al* (2007) asserted that "This suggests that operational alignment in SMEs could be at least as important as strategic alignment, and possibly of greater importance. Yet operational alignment in SMEs is poorly understood and an under-researched topic." But this claim is not without controversy. For example, Gutierrez *et al* (2009) asserted that "although current studies in alignment have not explored the differences between large and small organizations in much detail, most of the theories around alignment can be applied to small and medium-sized organizations with some confidence". These statements raise an important issue for IT researchers that has not yet been widely discussed: should the IT alignment in SMEs be studied in terms of a process view rather than a strategic view?

To answer this question, this exploratory study used a survey methodology with a sample of 38 SMEs in Chile and Colombia. Three comments should be mentioned on the sample and the study. First, the data was obtained through another ongoing investigation which was testing a new analysis methodology (Cataldo, Hardings and McQueen, 2009). Second, because of the sample size of 38 firms, analysis was limited to only parametric and regression techniques. Although 38 cases may be considered by some as a very small sample, other authors consider this an acceptable number for such techniques (Field, 2005; Milton, 1986; Sekaran, 2003; Coakes, Steed and Ong, 2009). Third, we are aware that nonprobability sampling put serious limitations on the results and their generalization. However, we believe that our results were sufficiently important to be subjected to scrutiny by other researchers.

The rest of this paper is separated into five sections. The next section summarizes the literature which is the background for this work and is followed by the design and methodology applied in this research. The remaining sections present the main findings, the discussion, and the conclusions and the potential for future work.

LITERATURE REVIEW

The concept of strategic alignment was influenced by the development of contingency theory, which proposes that organizations that achieve the best fit between internal needs and environmental demands will achieve the best adaptation (Venkatraman, 1989a). The IT alignment has raised special interest among researchers because, according to the contingency theory, the size of the company and the technology are factors which affect to the organization.

Part of alignment theory has focused on definitions of IT alignment with strategy. For example, some researchers define it as the degree to which the mission, goals and business plans are shared and supported by IT strategy (Chan and Reich, 2007). McKeen and Smith (2003) argue that strategic alignment exists when the goals and activities of the organization and information systems remain in harmony. These differences in definitions have also led to different terms to describe alignment, such as fit, connection integration, bridging, fusion, consistency and covariation (Chan and Reich, 2007). All those are used almost interchangeably, but in some cases represent small differences between the concepts. For example, fit is associated with measurement of alignment and is more related to mathematical models. Despite all this, it now seems that there is little discussion in the current literature about which "alignment" is the most appropriate way to denominate the fit between goals and the IT (Chan and Reich, 2007).

On the other hand, other researchers have focused on developing general models of fit between business and IT. These alignment models describe how different elements of an organization inter-

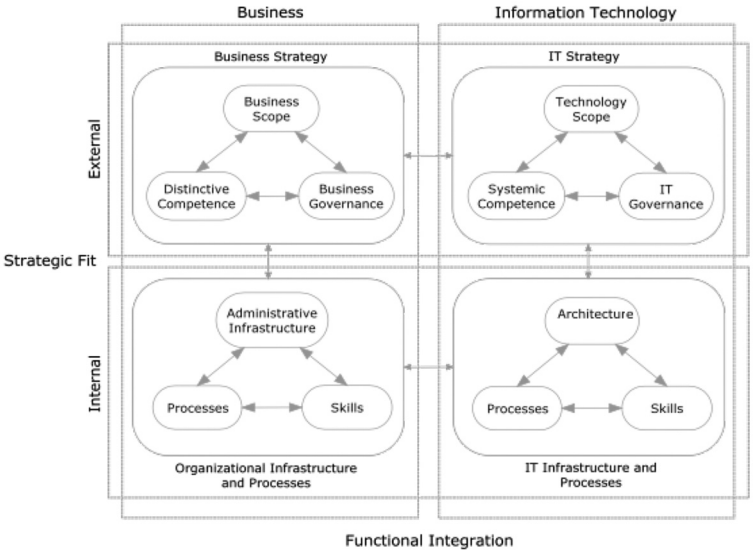

Figure 1: The SAM model by Henderson and Venkatraman raises two different types of alignment: strategic and tactical (Henderson and Venkatraman, 1999).

act to achieve an effective alignment. Many studies have used some concepts drawn from these models. The first alignment model was developed by Massachusetts Institute of Technology (MIT) and is known as MIT90 (Chan and Reich, 2007). This model argues that revolutionary changes involving investment in IT bring substantial rewards if and only if, the key elements of strategy, technology, structure, management processes and individuals and roles are held in alignment (Chan and Reich, 2007).

Based on the MIT90 model, Henderson and Venkatraman (1992) developed the Strategic Alignment Model (SAM) which is perhaps the most widely cited of all models. SAM is based on four key interrelated domains (see Figure 1): (A) business strategy, (B) IT strategy, (C) infrastructure and organizational processes, and (D) processes and infrastructure of information systems. Each domain has three components. Components of the domains A and B are: scope, distinctive competencies and governance (business and IT), while components of domains C and D are: infrastructure (administrative and IS), processes and skills. According to SAM, the alignment is achieved in bivariate form: (a) at the strategic level, i.e. between the business strategy with IT and (b) at the tactical level, i.e. between the infrastructure and organizational processes with the IT.

Several authors have sought to apply and validate the model. Avison *et al* (2004) examined SAM and proposed a technique based on this model. They used a case study methodology on an Australian firm. However, despite its popularity SAM has some shortcomings. For example, depending on the degree of intensity of information required in an industry, the scope of implementation of the model can vary as well as the value of some of its components (Chan and Reich, 2007). Smaczny (2001) critiqued SAM and the classic vision of alignment, and claimed that SAM is based on a mechanistic view of organizations and is impracticable. Smaczny prefers and defines the concept of "Fusion", and found that an adequate fit is achieved only when IT strategy is created simultaneously with the business strategy. Therefore a Chief Information Officer (CIO) should be an active player in the strategic planning process and know all business processes end-to-

end (Smaczny, 2001). Another problem with SAM that has been discovered is the limited ability of the model to become a practical tool to help managers understand how companies can align their technological resources with the organization's strategic goals (Avison *et al*, 2004). In fact, several works have been presented to operationalize the SAM model (Avison *et al*, 2004; Chan and Reich, 2007; Coleman and Papp, 2006; Gutierrez *et al*, 2009).

Other researchers have sought to extend or propose alternative models to SAM. For example, Baets (1992) developed another model, arguing that in many organizations there is no explicit strategy or it is not well known to all members. Baets' model considers the alignment as a process and involved four activities and their interactions: business strategy, organizational infrastructure and process, IS infrastructure and process, and IT strategy. Another alternative model was proposed by Ward and Peppard (2002), who argued that business performance is derived directly from business operations but IT skills impact that operation and other three organizational dimensions, namely IS/IT strategy, IT operations and services, and business strategy. The Peppard and Ward model is distinguished from other models in two fundamental ways. First, the model is based on the view that IT capabilities are only useful insofar as they are implemented and at the same time they create value in terms of improving business performance. In that sense, the model emphasizes value creation and effective implementation of IT skills. Second, the Peppard and Ward approach, based on implementation of IT, contrasts with other models that focus on aligning business strategy and IT, or aligning the structure and processes of the IT function in relation to business activities. Figure 2 (a) and (b) show the Baets model and the Ward and Peppard model in a simplified way.

Despite their differences, all the models presented share a common characteristic: they describe the IT alignment as a multidimensional and complex phenomenon. In fact, they all show that alignment should be targeted not only at the strategic level but also at a functional level. However, when studying the related literature is not difficult to realize that there is a strong bias towards the study of alignment at the strategic level, leaving aside the functional side of the alignment. For example, Gutierrez (2009) emphasizes the value of examining IT alignment beyond the strategic level that is typically addressed.

The trend to investigate only the strategic dimension of alignment has been criticized by some researchers. These investigators have come especially from those interested in studying IT alignment in SMEs. For example, Levy *et al* (2001) concluded that SMEs have an operational orientation rather than strategic one and therefore should be assessed at that level. Levy and Powell (2005) introduced a new model based on customer relationships and strategic business focus, which they called "focus-

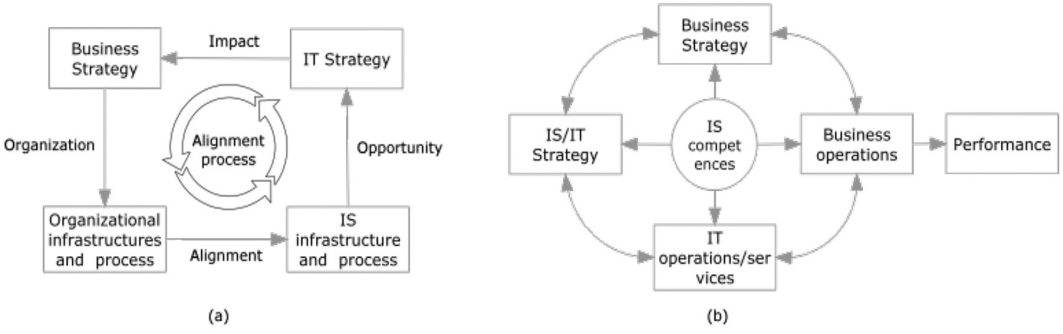

Figure 2: Both the alignment model by Baets (a) as Ward and Peppard's Model (b) describe alignment as a multidimensional process.

dominance". This model classifies SMEs into four types according to its focus: efficiency, co-ordination, partnership, and repositioning. Two criteria are used to classify a SME: the strategic focus and the number of customers. Once classified, the Levy and Powell (2005) model can help a SME to align their IT using different paths. They concluded that in SMEs "the limited planning that is undertaken tends to focus on operational systems to improve efficiency and effectiveness, and there is little concern with competitiveness."

Others have developed methods for measuring the alignment in SMEs using process-based organizational models. For example, Ravarini *et al* (2001) proposed a method that checked IT alignment using a set of standard processes. They argued that in a SME, it is questionable whether anyone in the company does consider IT efficiency, effectiveness and strategic alignment as issues. On the other hand, Tagliavini *et al* (2004) looked for alignment problems by studying the dissension between the Chief Executive Officer (CEO) and the CIO. They also used a standard set of business processes to represent the company. To justify their choice by the dimension of processes rather than strategic, the authors argued: "it is questionable whether within SMEs the IS development process is aligned with the business strategy." (Tagliavini et *al*, 2004).

Recently, Cragg *et al* (2007) analyzed the alignment in SMEs using a SAM based process approach, and claimed the process approach was more appropriate than one based on the strategy of SMEs. To operationalize the alignment they used the Process Classification Framework (PCF) of APQC (American Productivity & Quality Centre's International Benchmarking Clearinghouse 2005). PCF is a list of about seven hundred processes clustered in twelve levels. The model created by Cragg *et al* (2007) used a structural model based on Partial Least Square (PLS), and is shown in Figure 3a. They used moderation to compute the alignment and then contrasted it with IT Success. They found a significant correlation between process alignment and IT Success (0.83), and found process alignment explained 70% of the variability of IT success.

In summary, although the alignment models describe this phenomenon in a complex and multidimensional way, researchers have tended to study mainly the alignment from a strategic standpoint. This has led to some research on other dimensions of alignment. In particular, IT alignment researchers in SMEs have argued that the process approach is more appropriate than strategic. But as far as we know, no one has proved or rejected the latter claim through a comparative study.

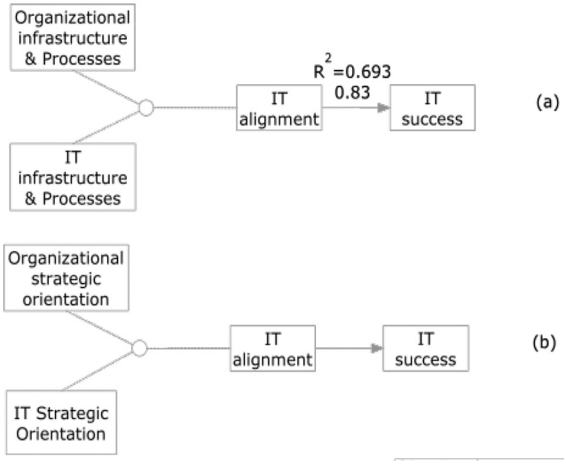

Figure 3: (a) Process alignment model developed by Cragg *et al* (2007) (b) Alternative model of strategic alignment.

Our objective for this study is to compare the two types of SME IT alignment: strategic versus process-level. The model developed by Cragg *et al* (2007) for comparison between the two approaches was selected because it is based on the widely accepted SAM model (Chan and Reich, 2007) and because eventually our results could be compared more directly with Cragg *et al* (2007). Therefore we compared the two alternative models shown in Figure 3 (a) and (b). Figure 3a shows the model studied by Cragg *et al* (2007) and Figure 3b shows the alternative model we used to compare both types of alignment. Thus our hypothesis can be stated as follows:

H0: In SMEs, the correlation index between alignment of process and IT success will be significantly higher than the correlation index between strategic alignment and IT success.

RESEARCH DESIGN

This section describes the study design, including the instruments used, the sample used, and some comments about the limitations due to the size and type of the sample.

Instruments used in this Research

Three survey instruments were used for this study:

- One for collecting data from the strategic orientation of the company and IT
- Another to collect data related to the strategic importance of processes and its technological support
- An instrument to collect information related to IT success.

To get the ***strategic orientation*** of the company and IT we used the survey developed by Byrd *et al* (2006) which was based on Strategic Orientation of Business Enterprise (STROBE) and Strategic Orientation of Information Systems (STROIS). STROBE assesses strategic orientation of companies and it was developed by Venkatraman (1989). Venkatraman operationalized the strategic direction of a company through six dimensions that he later expanded to eight (Chan, Huff and Copeland, 1997b). These dimensions are shown in Table 1. An important addition to the STROBE

Dimension	Definition
Company Aggressiveness	Push to dominate (i.e. increase market share) even if this means reduced prices/cash flow
Company Analysis	Reliance on detailed, numerically oriented studies prior to action
Company Internal Defensiveness	Emphasis on cost cutting and efficiency; internally "lean and mean"
Company External Defensiveness	Forming tight marketplace alliances (e.g. with customers, suppliers and distributors)
Company Futurity	Having forward-looking, log-term focus
Company Proactiveness	Being one step ahead of the competition; on the lookout for new business opportunities
Company Risk Aversion	Reluctance to embark on risky projects
Company Innovativeness	Creativity and experimentation are strengths

Table 1: Eight dimensions to analyse the strategic conduct of a firm (Chan *et al*, 1997a; Chan *et al*, 1997b)

Abbreviation	Process	Abbreviation	Process
P1	Develop Vision and Strategy	P7	Manage Information Technology
P2	Develop and Manage Products and Services	P8	Manage Financial Resources
P3	Market and Sell Products and Services	P9	Acquire, Construct, and Manage Property
P4	Deliver Products and Services	P10	Manage Environmental Health and Safety (EHS)
P5	Manage Customer Service	P11	Manage External Relationships
P6	Develop and Manage Human Capital	P12	Manage Knowledge, Improvement, and Change

Table 2: APQC Process Classification Framework (Source: Cataldo *et al* (2009))

methodology was STROIS developed by Chan (1997a). STROIS serves to operationalize the strategic orientation of the information systems. Chan developed the STROIS model as a complement to STROBE (Chan *et al*, 1997a; Chan *et al*, 1997b). Like STROBE, STROIS also uses eight dimensions to characterize a company. The instruments designed by Byrd *et al* (2006) are two questionnaires, one that is filled out by the business leader of the company (manager or owner) and another questionnaire which is filled by the technological leader (CIO or person in-charge). Each question was scored using a Likert scale.

STROBE and STROIS have already been validated in SMEs by other researchers such as Cragg *et al* (2002).

For ***process alignment***, we used the same set of questions designed by Cragg *et al* (2007) to measure the alignment of processes to IT success. As described above, the authors used a list of top-level processes of the PCF to build two questionnaires of twelve questions. As with STROBE, a questionnaire was given to the business leader and another to the technological leader (when there was one). Interviewees evaluated each question using Likert scales. These processes are shown in Table 2.

Finally, although there are several instruments proposed to measure ***IT success*** (Armstrong, Fogarty, Dingsdag and Dimbleby, 2005), we measured it using the same instrument developed by Cragg *et al* (2007), a survey of eight questions related to the impact of IT on the organization. The authors drew on work by Thong *et al* (1996) to select and adopt survey questions appropriate to the study environment. Thong *et al* (1996) recognized that there is no consensus on how to measure the effectiveness of IT, and developed an instrument based on how IT impacts the organization such as by helping to reduce operating costs, increasing revenue, improving profitability, and so on. The survey is given to the manager who is asked to assess each of the questions on a scale ranging from -1 (negative impact) to 3 (very positive impact). No question of the instruments used was significantly changed or altered.

The Sample of SMEs Studied

First of all, we should note that the data used in this study was collected from a group of companies that participated in a study in progress that was testing the design of a new analysis methodology that has been published elsewhere by Cataldo *et al* (2009).

Surveys were applied to a non-probabilistic sample of 43 SMEs but five companies were excluded because their responses showed bias (all responses were scored as five at least in one

Type	Employees	Number
Micro	1 to 5	5
Small	6 to 9	17
Medium	10 to 200	16
Total		38

Table 3: Distribution and classification of companies according to number of employees.

questionnaire). The selection of participating companies was based on convenience (access to contact person information) and participants were also asked to suggest other possible participants (snowball approach). Table 3 summarizes the firms analyzed. The total number of firms analyzed was 38. Finally, 35 firms were from Chile and three were from Colombia.

The type of business was classified according to the number of employees. This is the criteria most commonly used by researchers and institutions (Burgess, 2002, Levy and Powell, 2005). In particular, we adopted the criteria of the Government of Chile that divides companies with 200 or fewer employees into the categories shown in Table 3, which also gives the number of firms in this study in each of these categories.

Most respondents were the SME's manager-owner and the firm's IT leader, if there was one. The questions were translated into Spanish from the original English instruments and tested in a preliminary group of five firms. The corrections made after the pretest were minor.

The process of working with Chilean companies was as follows. An initial telephone contact was made with the manager of the company to schedule an appointment. At the start of the meeting for those who agreed to meet, the aims and methods of the study were given through a presentation of 15 minutes. Next, the surveys were administered – the questions related to business were given to the manager/owner and the questions related to technology were given to the IT leader. If there was not an identifiable IT leader, the owner/manager also answered the technology questions. Finally, we conducted a semi-structured interview with the owner/manager of the company, and on average, each interview lasted an hour and a half. In the case of Colombian companies, the procedure only excluded the presentation and the interview was by videoconference.

Limitations Based on the Size and Type of Sample

There are two important limitations to the study sample, namely its size and its non-probabilistic sampling. The sample size limits both the generalization of results as well as the techniques used in our study. In consequence, we performed only descriptive and regression analysis on the study data, because the application of sophisticated statistical methods based on PLS or other approaches require sample sizes exceeding 100 cases (Bryman and Cramer, 2008; Coakes *et al*, 2009). However, Sekaran (2003) suggests that a sample of 30 cases and less than 500 is adequate for a statistical study based on regression. In addition, Coakes *et al* (2009) suggest a minimum of 20 cases per variable when performing a multiple linear regression analysis.

To compute the minimal size of the sample we used the graph suggested by Field (2005) on page 173. Previous research showed an effect size of 0.83 (Cragg *et al*, 2007), which is a large effect (Field, 2005). According to Field (2005), in the case of large effect and using a simple regression model, we required around 30 cases. This coincides with the formula of Milton (1986). With an R^2 of 0.69 (Cragg *et al*, 2007), *p*-value of 0.05 and Δr^2 of 0.05 we needed a minimum sample of 26 cases. Based on these guidelines, our sample size of 38 appears appropriate for the analysis methods that were used.

Results

We utilized Cronbach's alpha to measure the reliability of the instruments. The Cronbach's alpha is the statistic most widely used to measure the internal reliability of multiple-item scales. The coefficient varies between 0 and 1 being considered a good level of reliability values of 0.8 or above (Bryman and Cramer, 2008). Table 4 shows Cronbach's alpha for each test. All instruments presented alpha greater than 0.8 confirming their reliability.

As the IT success (Is) ranges between -1 and 3 and that both the strategic alignment (Sa) as alignment to process-level (Pa) vary between 5 and 25, we decided to apply a linear transformation so that all the variables varied between 0 and 1. Table 5 presents the descriptive statistics of the three variables analysed and the results of the normality test.

For illustrative purposes we present the distribution graphs of the variables studied. Figure 4a and Figure 4b show the scatter diagrams of strategic alignment and process-level alignment respectively.

Test	Cronbach's alpha	Cronbach's alpha based on standardized items	Number of items
STROBE	.891	–	28
STROIS	.956	–	28
PCF (Business)	.865	.864	12
PCF (IT)	.891	.893	12
IT Success	.900	–	8

Table 4: Cronbach's alpha of each survey. All instruments showed good level of reliability.

	N	Minimum	Maximum	Mean	Std. Deviation	Normality test (p-value)
IT Success	38	.250	1.000	.71217	.209714	.737640
Strategic Alignment	38	.158	.884	.54944	.187705	.916527
Process Alignment	38	.184	.948	.56780	.187630	.978324
Valid N (listwise)	38					

Table 5: Descriptive statistics of IT Success, Strategic Alignment and Process Alignment

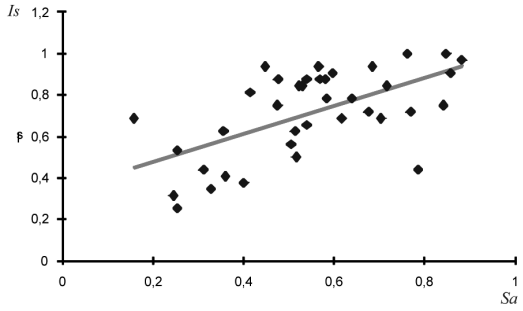

Figure 4a: Scattergram of strategic alignment vs. IT success

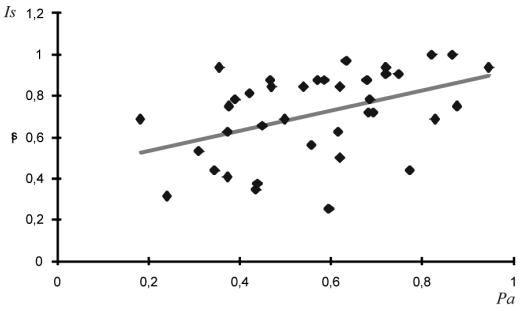

Figure 4b: Scattergram of process-level alignment vs. IT success

		IT Success	Strategic Alignment	Process Alignment
IT Success	Pearson Correlation	1	.598**	.433**
	Sig. (2-tailed)		.000	.007
	N	38	38	38
Strategic Alignment	Pearson Correlation	.598**	1	.810**
	Sig. (2-tailed)	.000		.000
	N	38	38	38
Process Alignment	Pearson Correlation	.433**	.810**	1
	Sig. (2-tailed)	.007	.000	
	N	38	38	38

**. Correlation is significant at the 0.01 level (2-tailed).

Table 6: Correlation Matrix

Table 6 presents the correlation matrix.

From Table 6, it can be seen that IT success was positively and significantly correlated with strategic alignment $r = .598$ ($p < .001$) and process-level alignment $r = .433$ ($p < .05$). Strategic alignment also was correlated with process-level alignment, $r = .810$ ($p < .001$).

Next, we used Williams' T2 statistic to compare both correlations. This statistic is used in correlated correlations evaluating the null hypothesis H_0: $r_{13} = r_{23}$ when $r_{12} \neq 0$ (Steiger, 1980). Finally, we did not find a significant differences among the relationships IT success – strategic alignment and IT success – process-level alignment (t-score = 1.984, $df = 35$, p-level = .05, 2-tailed).

Therefore, we reject the initial hypothesis that in SMEs process-level alignment fits better with IT success than strategic alignment.

Although we had already answered the initial question posed in this study, the high correlation between strategic alignment and process-level alignment caught our attention. A very high correlation between the independent variables strongly suggests that there is a transfer of information between them to the dependent variable (Cohen, Cohen, West and Aiken, 2003). We decided to explore a new explanatory model. Figure 5 shows the scattergram between strategic alignment and process-level alignment.

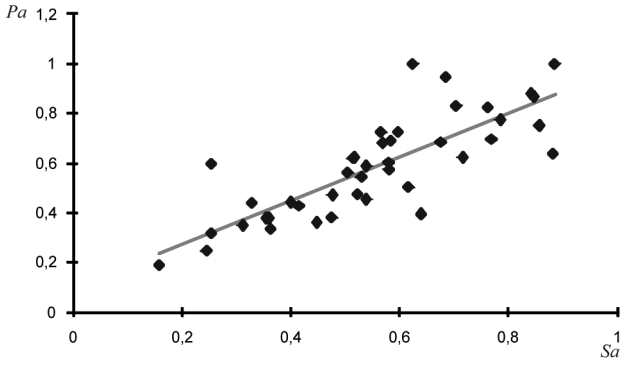

Figure 5: Scattergram shows a very high correlation between Strategic Alignment and Process-level Alignment ($R^2 = .810$)

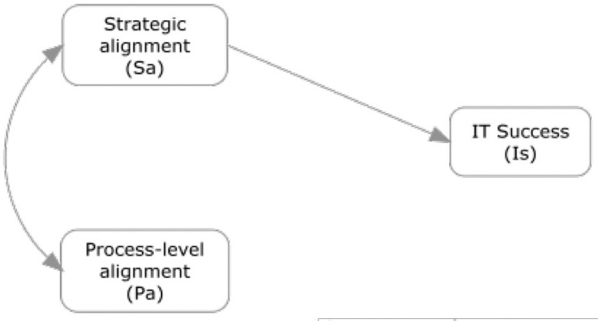

Figure 6: Postulated model

Cohen *et al* (2003) proposed several models of relationships between these three variables. To discriminate between these models, an analysis of the relationship between zero-order correlations of these variables seemed to be indicated. Given that r_{pa}- $r_{sa}r_{pa\text{-}sa} \approx 0$ (-0.083) the relationship between process-level alignment and IT success would be apparently spurious. In other words, strategic alignment would be a confounder of the relationship between process-level alignment and IT success (Cohen *et al*, 2003). The model that evolved from this analysis is shown in Figure 6.

The line with two arrowheads between the two types of alignment indicates that we do not know the direction of the relationship (exogenous variables) while the direction of the arrow between strategic alignment and IT success is based on previous work showing that the latter is an effect of the former (Cragg *et al*, 2007; Cragg *et al*, 2002).

To test the model of Figure 6, we applied the procedure proposed by Bryman and Cramer (2008). In other words, if the relationship between process-level alignment and IT success is spurious, we would expect that the partial correlation between P_a and I_s when P_s is controlled to fall below half of the zero-order correlation between P_a and I_s (Bryman and Cramer, 2008). Table 7 shows the results of partial correlation between Process-level alignment and IT Success.

Table 7 shows that relationship between IT success and process-level alignment falls significantly when it is controlled by strategic alignment. Moreover the relationship between IT success and process-level alignment ceases to be significant. In conclusion, our results would suggest that in the SMEs analysed, the relationship between IT success and process-level alignment is nothing but a manifestation of the causal effects of strategic alignment.

Control Variables			**IT Success**	**Process Alignment**
Strategic Alignment	IT Success	Correlation	1.000	-.109
		Significance (2-tailed)	.	.519
		Df	0	35
	Process Alignment	Correlation	-.109	1.000
		Significance (2-tailed)	.519	.
		Df	35	0

Table 7: Partial correlation between Process-level Alignment and IT Success

DISCUSSION

The correlation matrix showed that strategic alignment predicted better IT success than process-level alignment. Indeed the former explained about 35.8% of the variability of the dependent variable while the alternative model (process-level alignment) explains only about 18.7% of the variability of IT success. However, we did not find a significant difference between the models themselves. In any case, our findings show that process-level alignment is not a better predictor of IT success than strategic alignment, in other words, the initial hypothesis of this study must be rejected. Moreover, our results would refute the claims of researchers who have suggested that in SMEs process-level alignment would fit better than strategic alignment (Ravarini, Tagliavini, Buonanno and Sciuto, 2002; Tagliavini *et al*, 2004; Cragg *et al*, 2007).

A major reason for not having predictive differences between the two models seems to be the high correlation between the two types of alignment. Indeed, the models are coincident because the correlations among the independent variables are very high. Although we expected that the two types of alignment correlated mutually, we did not expect such a high correlation.

This raises the question of why strategic alignment presents such a high correlation with process-level alignment. One possible explanation for the high correlation between variables is that both were measuring the same construct, in other words, strategic alignment is the same or very similar to process-level alignment. Indeed, according to Bryman and Cramer (2008) when two variables have a high correlation (0.8 or higher), it may be because the same variable is being measured. However, stating that both types of alignment are equal contradicts a lot of related work. For example, all the most popular alignment models specify strategic and process as two different dimensions (Baets, 1992; Henderson and Venkatraman, 1999; Ward and Peppard, 2002).

On the other hand, the model proposed in this study could be a sound explanation to this relationship between the two types of alignment and IT success. The model shows that both process-level alignment and IT success are driven by strategic alignment. In our interviews, we found evidence that confirms this. For example, the owner of one design company told us that the way to overcome a deep crisis was through IT. He told us: "I resolved the crisis by incorporating technology in all areas; it allowed me to downsize from 20 to 7 persons, only the essential. Now for example, I do the secretarial work by myself. Also when it is needed, I become an extra designer." He added: "Major contribution of IT: Elimination of secretary, automation and cost reduction...Minor contribution of IT: more automation!!" This is a clear example that the strategy, in this case survival, has led the alignment of processes with IT (acquire technology to automate processes hence reducing costs). Moreover, the IT success score of the firm was 1.0 (i.e. maximum) showing IT success is led by strategy alignment as well. The owner of another company scored the alignment of his company as a 2 (using a scale of 1 to 5). He said: "our alignment today is 2 but tomorrow it will be 4...we hope to install an ERP and better control our processes." When asked what he needed to do to achieve maximum alignment, he said: "Measuring consumer satisfaction: I would like to have an indicator that I could to track." In this case, the manager bought an ERP to improve the process control (process-level alignment) but was also looking to measure the customer satisfaction performance of the firm (strategy alignment).

If process-level alignment and IT success are driven by the strategic alignment of a company, then this would not be inconsistent with the results of other investigations such as Levy and Powell's (2005). In light of our results, our argument would be that behind this operational focus occurs a strategic choice (voluntary or not) taken by the owner of a company. This is what researchers have defined as intended versus realized strategy (Chan *et al*, 1997b; Venkatraman, 1989). In other words, although most SMEs lack an explicit strategy, they always have an explicit

or implicit vision (Avison, Eardley and Powell, 1998). This shapes the strategic orientation of the company (realized strategy) and turns it into alignment of technology and IT success. In addition, Ward *et al* (2002) have suggested that there is a relationship between the management and the benefits perceived of IT. They said: "good management, with a high and improving value/cost ratio, will use new resources to increase their effectiveness further by focusing on adding more value still—getting better at their job—or they will discard the technology. Poor management will focus on improving the value/cost ratio by reducing the cost component and will be looking for IS/IT to produce efficiency savings—implying automation, but of tasks that do not lend themselves to automation. This piecemeal automation approach misses the opportunity to improve personal and collective effectiveness." (Ward and Peppard, 2002)

However, our results seem to be inconsistent with those of Cragg *et al* (2007). Apparently, the results of Cragg *et al* (2007) were significant because a spurious relationship exists between process-level alignment and IT success. Their study involved only two of the three variables of our model hiding the influence of strategic alignment on IT success. Considering the limitations of our study, it is clear that more research is needed on this issue to confirm or overturn these initial findings.

Finally, the relationship between IT success and strategic alignment may be explained by using the idea of perception. Indeed, the instrument used to quantify IT success really measures the perceived usefulness of IT. In that sense, IT will be more useful if it fits with the strategic choices determined by management. In other words, the more the manager perceives that the use of IT fits with the strategic profile of the company, the greater the perception of IT success.

CONCLUSIONS

The findings in this exploratory study have shown that there are no significant differences between process-level alignment and strategic alignment to predict IT success, although strategic alignment was the variable that best predicted the variability of IT success. This would refute the assertions of researchers who have suggested that in SMEs, alignment models based on processes better explain IT success than alignment models based on the company's strategy (Cragg *et al*, 2007; Ravarini *et al*, 2002; Tagliavini *et al*, 2004).

The results of this study also suggest that the relationship between process-level alignment and IT success may be spurious and that strategic alignment may be the confounding variable. The model developed in this exploratory study proposes that both IT success and process-level alignment could be driven by strategic alignment. Despite the lack of formal and explicit long term planning in SMEs, (Avison *et al*, 1998; Levy and Powell, 2005), there always seems to be an implicit strategy that shapes the way that IT is used in processes.

Despite the limitations mentioned, our study makes two important contributions to the area of alignment of IT in SMEs. This seems to be the first study, to our knowledge, that compares the level of alignment with the strategic alignment processes. The study opens the debate, and suggests further research opportunities on whether strategic alignment of IT is better or worse than process alignment processes of IT in SMEs.

Finally, we think that the differences between our results and those of other researchers, particularly Cragg *et al* (2007), encourage making these results more widely known. It is hoped our findings will encourage other investigators to seek better understanding of the mechanisms of IT alignment in SMEs, and in particular the value of looking at process level alignment of IT.

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