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Aligning IT, strategic orientation and organizational structure

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Abstract

Purpose – The purpose of the paper is to examine and analyze the alignment between (information technology) IT, strategic orientation (SO) and organizational structure (OS) and their impact on firm performance (FP).

Design/methodology/approach – A theoretical framework is proposed regarding the constructs of IT, SO and OS. A model incorporating these three constructs is examined and their impact on FP is assessed using structural equation modeling (SEM). The sample data from 295 firms were obtained through structured questionnaires.

Findings – The results of the SEM support the hypothesis that the alignment between IT, SO and OS significantly affects FP.

Research limitations/implications – Non-financial and intangible performance measurements are not included and the sample is not homogeneous.

Practical implications – This study suggests that managers should choose the appropriate level and type of IT, depending on a firm's structure and SO, in order to benefit from the advantages of IT usage and achieve higher performance levels.

Originality/value – This study presents an overview of the impact of SO, OS and IT on FP, and that shows that there is scope for further research into the inter-organizational relationships that exist between them.

Keywords Strategic orientation, Organizational structures, Information technology, Firm performance, Structural equation modeling

Paper type Research paper

1. Introduction

The growth and diversity of international business has raised new competitive challenges and requirements, forcing firms to re-examine their internal environment in order to improve their performance and achieve a sustainable competitive advantage (Wright *et al.*, 1995). Thus, many firms have spent a vast amount of resources in order to improve their competitiveness by looking at their internal processes (Day and Lichtenstein, 2006; Stewart, 2007).

During the 1980s, it was believed that the basic source of a firm's competitive advantage relied on industry structure (Porter, 1985). In the 1990s, researchers (Barney, 1991; Kay, 1995; Powell and Dent-Micallef, 1997) focused their studies on firm's internal factors, introducing the "resource-based" view of the firm. Recent research findings suggest that firms may improve the value of their established competitive advantage through their strategic orientation (SO) (Morgan and Strong, 2003), information

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technology (IT) (Griffiths and Finlay, 2004; Stewart, 2007) and business structure (Bergeron *et al.*, 2004). Actually, the relationship between SO, IT, organizational structure (OS) and firm performance (FP) has been the focal point for a number of researchers (Raymond *et al.*, 1995; Croteau *et al.*, 2001; Bergeron *et al.*, 2004).

In response to anticipated changes in their environment, firms are deploying IT at an increasing rate. Thus, IT investment has been an important issue for senior executives, as it is one of the major budget items in most businesses. However, there is more than one way to invest in IT, this is why several theoretical IS models focus on the impact of alignment upon performance (Bergeron *et al.*, 2004). IT could influence business performance in a way that it would be in "alignment" or "fit" with the strategic, structural, and environmental dynamics specific to each organization. Interestingly, a fundamental question underlying these transformations has been raised: how can an organization:

- translate its IT investments into increased business performance;
- improve its productivity; and
- increase the market share it holds, and profitability or other indicators of organizational effectiveness?

Management literature has shown contradictory results on the impact of IT investments on business performance (Sircar *et al.*, 2000), meaning that IT investments can improve business performance under many market conditions.

SO is one of the aspects of corporate culture of a firm (Deshpande *et al.*, 1993; Hurley and Hult, 1998; Narver and Slater, 1990). Corporate or organizational culture represents intangible resources for firms (Barney, 1991; Grant, 1991). Managers place different emphases on strategic behaviors and select specific SOs depending on what they wish to accomplish (Olson *et al.*, 2005). For example, many firms with a strong customer orientation emphasize the creation and maintenance of customer value. Other firms, more competitor oriented, encourage in-depth assessment of targeted competitors, while, on the other hand, and cost-oriented firms pursue efficiency throughout their value chain (Day, 1990; Porter, 1985). These different types of SOs are not mutually exclusive; firms may engage in multiple sets of behaviors (Gatignon and Xuereb, 1997).

The purpose of this paper is to analyze the contemporary impact of SO, OS and IT on FP and to assess the organizational fit, incorporating all these constructs into a model that is tested using the structural equation modeling (SEM) approach. Literature suggests that the majority of the studies on alignment have focused on two dimensions, as for example between business and IT strategies or between the former and IT structures (Sabherwal *et al.*, 2001). Moreover, Bergeron *et al.* (2004, p. 1016) point out that alignment research has been undertaken using samples from "[. . .] large, technologically sophisticated organizations"; hence, results not only cannot be generalized to other organizations, but also do not assists researchers to develop and test "[. . .] a valid operational model of strategic alignment". Based on the research model proposed by Bergeron *et al.* (2004), the effect of each of SO, OS and IT constructs on performance versus their effect, when considered as a cohesive, aligned group of constructs is examined. In this respect, the current constitutes a replication research, which not only re-tests the alignment hypothesis but it does so in a very different non-North American setting, using a sample that comprises all kinds of firms, from very small to very large, operating in Southeastern Europe.

2. Literature review

2.1 Strategic orientation

The concept of strategy has been associated with FP, as it is a focal issue that highly determines the decision-making processes within organizations (Morgan and Strong, 2003). This is why, explaining as well as predicting FP is a central objective in the strategic management research (Ketchen *et al.*, 1996). Furthermore, contemporary strategic management research aims at identifying the sources and determinants of observed differences in profitability among organizations (Spanos *et al.*, 2004). As Escriba-Esteve *et al.* (2008), claim that the positive influence of the firm's SO may be moderated by the environment conditions, the experience of top management team, and the corporate and competitive strategies developed by the firm.

Traditionally, the concept of strategy has been viewed in two dimensions, namely process and content. The strategy process refers to the activities that guide an organization towards choosing a competitive strategy (Ketchen *et al.*, 1996). Strategy content, on the other hand, is related to a firm's competitive forces present in the environment, such as actual and potential competitors, buyers and suppliers, as well as product/service substitutes (Porter, 1980). The strategy chosen enables the organization to predict, respond to, or dictate the existing environmental forces, making strategic content a key determinant of performance (Ketchen *et al.*, 1996).

However, other researchers (Huff and Reger, 1987) argue that this distinction between process and content is, to a large extent, artificial. Therefore, an integrated approach to strategy, accounting for process and content, as well as their interactions, is needed, as research suggests that process and content factors have a major impact on performance along with their interactions (Ketchen *et al.*, 1996).

Strategy content is merely preoccupied with how an organization uses strategy to adapt or to change some characteristics of its environment in order to achieve a more advantageous alignment with them (Manu and Sriram, 1996). It focuses upon the outcome of strategic decisions, while its identifiable form in organizations has been also described as strategic fit, strategic predisposition, strategic thrust, strategic choice and, more frequently, is referred to as SO (Morgan and Strong, 1998, 2003).

Relevant literature has followed three main approaches regarding SO measurement: the narrative approach, the classificatory approach and the comparative approach (Venkatraman, 1989; Morgan and Strong, 1998, 2003). As Venkatraman (1989) describes, the narrative approach mirrors the case-based tradition of business policy, based on the notion that the complex features of business strategy should only be illustrated in their holistic and contextual form. It is based on the belief that the distinctiveness of the concept of strategy is grounded upon its uniqueness to a specific situation, adopting a rather philosophical method for examining an organization's SO (Venkatraman, 1989).

The classificatory approach, according to Venkatraman (1989), moves away from the idiosyncratic, narrative description of strategy, developing conceptual or empirical classifications of strategy. This approach attempts to classify SO based on either *ex ante* theoretical reasoning ("typologies" – Porter, 1980) or *ex post* empirically obtained categorizations (Morgan and Strong, 2003). Empirical categorizations are also known as "taxonomies" and reflect empirical existence of internally reliable patterns. This approach is believed to accurately capture the breadth and integrative character of business strategy based on its internal consistency; it is however difficult to grasp the

intra-group differences regarding the core strategic dimensions (Venkatraman, 1989; Speed, 1993).

Finally, the comparative approach used here intends to identify and measure the key traits/dimensions of the strategy construct (Venkatraman, 1989). According to Lukas *et al.* (2001), strategy is best specified as a multifaceted construct consisting of different orientations. This way, business strategy is viewed in terms of the relative emphasis placed by the organization, along each underlying dimension or subset of dimensions of the SO, rather than across various strategic classifications (Venkatraman, 1989; Morgan and Strong, 1998, 2003; Lukas *et al.*, 2001). Venkatraman (1989) aiming to arrive at a set of operational indicators for the dimensions of the "SO of business enterprises" construct, proposed a six-dimensional model of SO: aggressiveness, analysis, defensiveness, futurity, proactiveness and riskiness. These operational indicators have been commonly used in strategy research (Morgan and Strong, 1998, 2003; Lukas *et al.*, 2001) and serve as useful measures for relevant research in an attempt to capture and test theoretical relationships (Venkatraman, 1989).

2.1.1 Aggressiveness. Aggressiveness is a component of SO, which describes a continuum ranging from offensiveness to defensiveness in a firm's behaviour (Covin and Covin, 1990). This refers to the allocation of business resources and business's improved position, in terms of market share, at a rate relatively faster than competitors (Clark and Montgomery, 1996). In order to differentiate from competitors, businesses often choose to invest in product innovation (Morgan and Strong, 2003), in order to gain a niche market position. When a firm outperforms its rivals, strong offensive posture and aggressive responses to the actions of competitors are critical to market performance (Fombrun and Ginsberg, 1990; Lumpkin and Dess, 2001). The assumption generated by the above is that when a firm orients itself aggressively, performance can be positively affected, as originally tested by Levitt in the 1960s (Morgan and Strong, 2003).

2.1.2 Analysis. The analysis dimension reflects a firm's capability to secure an advantage in a competitive market (Morgan and Strong, 2003). According to Venkatraman (1989), SO is related to the overall problem-solving position assumed. Being an important characteristic of the decision-making processes in a firm, analysis seeks the best possible solution for this firm's problems (Miller and Friesen, 1984). Analysis also incorporates the level of internal consistency achieved in the overall resource allocation (Grant and King, 1982), as well as the use of suitable management systems, including reward, information and control systems (Venkatraman, 1989). From a market perspective, analysis includes predicting changes in customer base, competitive structure, market partners, industry and environmental factors (Ganesan, 1994). Chan *et al.* (1998) reported that analysis could be defined as the reliance on detailed, numerically-oriented studies, prior to action.

2.1.3 Defensiveness. Defensiveness is the organization's ability to maintain prominence within its domain (Morgan and Strong, 2003), a concept that was first introduced by Chaganti and Sambharya (1987). This orientation aims at helping a firm to form tight marketplace alliances with its customers, suppliers and distributors (external defensiveness). The same tightness is also applied internally (internal defensiveness) (Chan *et al.*, 1998). McKee *et al.* (1989) and Day (1994) proposed a positive relationship between business performance and defensiveness. The same conclusion was also reached by Venkatraman (1989) and Morgan and Strong (2003).

2.1.4 Futurity. The futurity dimension refers to the adoption of a forward-looking, long-term focus (Chan *et al.*, 1998), reflecting one of the basic notions of strategic management support, that is, how well prepared for and positioned in future environmental situations an organization can be (Morgan and Strong, 1998).

Futurity can also be indicative of temporal considerations reflected in key strategic decisions, in terms of the relative emphasis on effectiveness (longer term) considerations versus efficiency (shorter term) considerations (Venkatraman, 1989). As far as the relationship between futurity and performance is concerned, it has been found that commercial payoffs tend to be noticeable in firms pursuing a long-term strategy, in comparison with short-term and transitory firms, regardless of the measures used to assess business performance (Doyle and Hooley, 1992, cited in Morgan and Strong, 2003).

2.1.5 Proactiveness. Proactiveness of SO allows an opportunity-seeking and forward-looking perspective and reflects a firm's tendency to participate in emerging industries and continuously pursue market opportunities (Miles and Snow, 1978; Venkatraman, 1989). It is also considered as a core characteristic of innovative behavior (Manu and Sriram, 1996). The introduction of new technologies, ahead of the competition, allows the realization of pioneer advantages (Dess *et al.*, 1997). From the other side, eliminating technologies ensures an adequate technology focus (Venkatraman, 1989). This dimension is indicative of a firm's aspiration to continuously introduce new brands and products (Lukas *et al.*, 2001) and being one step ahead of its competitors (Chan *et al.*, 1998).

The proactiveness dimension also entails removing resources from operations and products in mature stages of the life cycle and investing in the introduction of new products and processes (Wiklund and Shepherd, 2005). Considering these findings, successful management of innovation requires a proactive posture towards the market and technology (Talke, 2007). Okpara's (2009) results indicated that firms that adopted proactive orientation achieved higher performance, profitability, and growth compared with those that adopted a conservative orientation.

2.1.6 Riskiness. A firm's level of riskiness refers to how decisions are made and action is taken with respect to the certain knowledge of probable outcomes (Talke, 2007). This commits significant resources to uncertain projects (Dess and Lumpkin, 2005). The riskiness trait pertains mainly to resource allocation decisions, the choice of products and markets (Venkatraman, 1989) and, in general, the gains or losses a business decision and consequent actions can generate (Clark and Montgomery, 1996). Risk taking has also been traditionally treated as an individual trait, usually referring to the business behavior of higher level administration (CEO's) (Venkatraman, 1989).

Several studies show that an active risk management is of central relevance for FP under uncertain market and technology conditions (Raz *et al.*, 2002; Dvir *et al.*, 2003; Salomo *et al.*, 2004). Where these traits of riskiness can be found in a firm's SO, as Morgan and Strong (2003) indicate, performance is enhanced.

2.2 Organizational structure

The OS of an enterprise refers to an internal model of links and relationships between and within its factors, at all levels of the organization, in precisely defined quantities (Zehanovic and Zugaj, 1997).

Campbell *et al.* (1974) implied a useful distinction between structural and structuring characteristics of organizations. For example, the physical characteristics, such as size, span of control, and flat/tall hierarchy, are the structural qualities of

an organization. In contrast, structuring includes policies and activities occurring within the organization members, such as formalization, centralization, specialization, professionalization and vertical differentiation, that have received a great deal of attention (because of their impact on organizational performance) (Stank *et al.*, 1994).

Formalization refers to the degree to which decisions and working relationships are governed by formal rules and standard policies and procedures (Tsai, 2002; Iyer *et al.*, 2004). Centralization, on the other hand, refers to the focus of decision-making authority and control within an organizational entity (Tsai, 2002). Maximum centralization implies decisions taken at the highest level possible (Andersen, 2002). Specialization includes the department of tasks and activities across positions within the organizational entity (Tsai, 2002). Professionalization refers to the percentage of professional staff members with certain educational backgrounds and noteworthy experience (Miller *et al.*, 1991). Vertical differentiation, finally, refers to the number of levels in the firm's hierarchy below the chief executive level (Damanpour, 1991).

OS is generally believed to be associated with FP (Meijaard *et al.*, 2005). Spanos *et al.* (2004) indicated a significant influence of business structure on firm profitability, while Tang *et al.* (2006) found that indeed the characteristics of OS affect organizational performance. Furthermore, Tsai (2002) claims that three of the structuring components, formalization, centralization and specialization, are commonly considered to be important influences on organizational performance.

Similarly, Meirovich *et al.* (2007) found that formalization improves organizational performance, which is also supported by Kim (2007), as well as Wang (2003), who claims that when a firm characterized by high formalization can, in fact, perform better than its competitors. Formalization enables the creation of organizational memory of best practices, which, in turn, makes knowledge use more efficient and may has a positive impact on performance, especially when it serves to collect valuable information and conveys priorities and values (John and Martin, 1984). On the other hand, Lin *et al.* (2008) found that OS (formalization and decentralization) does not play a moderating role in the relationship between innovativeness and business performance; whereas the extent of formalization of an OS negatively correlates with business performance.

A number of studies (Reiman, 1975; Wang, 2003; Robson, 2004; Kim, 2007) implied that specialization improves organizational performance. Further, Martínez *et al.* (2007) suggest that when firms improve their level of professionalization, they may take advantage of their strengths and achieve better performance. Thus, there is a positive linkage between firm's professionalization and performance. Finally, Ensley *et al.* (2006) stated that there might be a positive relationship between vertical differentiation and FP.

2.3 Information technology

During the past 15 years, a number of researchers (Boudreau *et al.*, 1998; Griffiths and Finlay, 2004; Stewart, 2007) focused on the impact of IT investment on organizations' competitiveness, producing condlicting results. For example, Loveman (1994) concluded that IT investments have practically no impact on productivity. In contrast, other researchers have reported that investments in IT have a positive impact on organizations' performance (Barua *et al.*, 1995; Hitt and Brynjolfsson, 1996).

The common purpose of investing on IT is to improve organizations' competitive advantages and, thus, its performance (Mahmood and Mann, 1993; Ragowsky *et al.*, 1996). According to Bergeron *et al.* (2004), there must be an "operationalized alignment" between

business strategy, business structure, IT strategy and IT structure. In other words, IT has to "fit" an organization's strategy, structure and environment. Focusing on the terms IT strategy and IT structure, they concluded that:

(1) IT strategy consists of:
   - IT environmental scanning; and
   - strategic use of IT, while
(2) IT structure consists of:
   - IT planning and control; and
   - IT acquisition and implementation.

IT environmental scanning expresses an organization's ability to identify and understand the technological changes in its industry. Heo and Han (2003) approach firms' IT environment by using two measures:

(1) the identification of the characteristics and the number of alternative IT structures; and
(2) the description and testing of the relationships between IT structure and performance.

Their research results suggest that there is a positive relationship between IT environmental scanning and FP.

The term "strategic use of IT" refers to the way firms use IT, in order to achieve and create a significant competitive advantage in their industry (Bergeron *et al.*, 2004) and, as a consequence, improves product quality and performance (Blili and Raymond, 1993). Further, Duh *et al.* (2006) found that IT planning and control is positively related to and directly impacts performance. Finally, Li and Ye (1999) examined the impact of the environmental dynamism on the relationship between IT investment and FP to find a strong positive effect. They also reported that IT implementation improves a firm's overall performance.

2.4 Firm performance

Performance measurement systems play an important role in developing strategic plans and evaluating the achievement of organizational objectives. An effective performance measurement system should cover all aspects of performance that are relevant to the existence of an organization and the means by which it achieves success and viability (Kaplan and Norton, 1996; Hillman and Keim, 2001).

Generally, performance indicators combine financial, strategic and operating business measures to estimate how well a company meets its targets. Business performance enables the management to evaluate the position of the organization, translating the needs for performance improvement. Business performance management research has defined performance from a variety of perspectives (Venkatraman and Ramanujam, 1986). In this study, business performance was measured by using four financial items: ROA, sales growth, profitability (Brown and Blackmon, 2005) and liquidity. Financial measures were selected due to the fact that non-financial measures have some limitations. For example, some non-financial performance measures may be difficult to measure accurately, efficiently, or in a timely fashion.

Strategic management researchers have proposed a perceptual (primary) approach to measure business performance (Dess and Robinson, 1984; Miller, 1987; Venkatraman and Ramanujam, 1986). Venkatraman and Ramanjuam (1985) found positive and statistically significant association between perceptual (primary) and secondary data on performance indexes were observed. In this approach, respondents are asked to indicate on a seven-point Likert scales how his or her firm performed relative to the competition. Such an approach is most appropriate in a small business context where financial data are often unavailable or unreliable (Sapienza *et al.*, 1988).

2.5 Organizational (co-) alignment

> Coalignment (also termed consistency, contingency, or fit) [...] between strategy and its context – whether it is the external environment [...] or organizational characteristics, such as structure [...] administrative systems [...] and managerial characteristics – [...] has significant positive implications for performance (Venkatraman and Prescott, 1990, p. 1).

Business-IT alignment, on the other hand, is important to organizations primarily because it assists the " [...] development and implementation of cohesive organization and IT strategies that enable firms to focus on the application of IT to improve the business" (Papp, 1999, p. 367).

Many studies (Tallon and Kraemer, 1999; Croteau *et al.*, 2001; Pollalis, 2003; Byrd *et al.*, 2006; Rivard *et al.*, 2006) investigate the alignment of IT, SO and OS and reported that this alignment may have positive effects on FP. For example, Lee *et al.* (2008) suggested that alignment between business and IS groups increased IS effectiveness and business performance, while business-IT alignment, resulting from socio-technical arrangements in firms' infrastructure has been found to positively affect performance. Jean *et al.* (2008) claimed that IT capabilities contribute directly to improved organizational process such as coordination, transaction specific investment, absorptive capacity and monitoring; these, in turn, contribute to strategic and operational performance outcomes.

According to Sabherwal *et al.* (2001), this alignment can be decomposed to:

- "cross-dimensional" alignment (IT and SO fit);
- "structural" alignment (IT and OS fit); and
- "business" alignment (SO and OS fit).

Further, Venkatraman and Prescott (1990) pointed out that a holistic examination (contingency theory) of the interrelations of these constructs (organizational alignment), has greater exploratory power because of the nature and complexity of the interrelations of the examined constructs. This study adopts this view and examines the combined impact of IT and organizational alignment on FP (Figure 1). Subsequently, the following hypothesis is proposed:

H1. SO, IT and OS will have a stronger impact on performance when aligned than that each of them has when considered independently.

3. Research methodology

A structured questionnaire was designed and used for the collection of the data. All constructs were measured using multiple items and all items (totaling 53) were measured using a seven-point Likert-type scale ranging from one (very low)

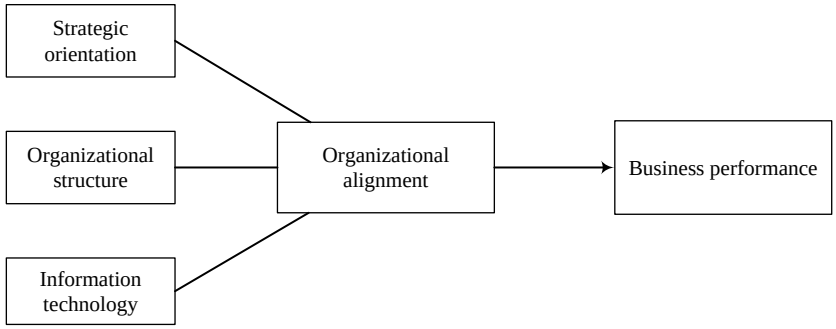


Figure 1.
The proposed research model

to seven (very high). The questionnaire is divided into five sections. The first section refers to the general characteristics of the firm (industry, size, sales, market share and number of employees). The second section contains questions concerning firm's SO. The next section measures firm's business structure, while section four deals with IT-related issues. Finally, the last section is about firm's business performance (ROA, sales growth, profitability and liquidity). Table I presents all constructs, their factors and the number of items used to measure each construct along with the related literature.

Content validity was established adopting a questionnaire pre-testing process (Zikmund, 2003). Pre-test participants (ten managers or CEOs and expert reviewers) were asked to comment on any difficulty or lack of clarity in the scale items and instructions.

Constructs	Factors	Items	References
SO	Aggressiveness	4	Venkatraman (1989), Morgan and Strong (2003), Talke (2007)
	Analysis	6	Venkatraman (1989), Morgan and Strong (2003), Talke (2007)
	Defensiveness	4	Venkatraman (1989) and Morgan and Strong (2003)
	Futurity	4	Venkatraman (1989) and Morgan and Strong (2003)
	Proactiveness	4	Venkatraman (1989), Morgan and Strong (2003), Talke (2007)
	Riskiness	4	Venkatraman (1989), Morgan and Strong (2003), Talke (2007)
OS	Formalization	1	Bergeron *et al.* (2004)
	Professionalization	1	Bergeron *et al.* (2004)
	Centralization	1	Bergeron *et al.* (2004)
	Vertical differentiation	1	Bergeron *et al.* (2004)
	Specialization	1	Bergeron *et al.* (2004)
IT	IT environmental scanning	3	Bergeron *et al.* (2004)
	IT strategic use	6	Bergeron *et al.* (2004)
	IT planning control	5	Bergeron *et al.* (2004)
	IT acquisition and implementation	4	Bergeron *et al.* (2004)
FP	ROA	1	Young and O'Byrne (2001)
	Sales growth	1	Bergeron *et al.* (2004)
	Profitability	1	Bergeron *et al.* (2004)
	Liquidity	1	Young and O'Byrne (2001)

Table I.
Questionnaire constructs, factors and items

Some modifications were made (wording) in order to ensure that the original text was clearly interpreted in the target language, i.e. Greek. Then, the translated questionnaire was validated using the "back-translation" method, which is, translating back into the original language to ensure correspondence with the original version (Zikmund, 2003). Wording of questions was again slightly modified before the final format was established, based on remarks and suggestions offered by the pre-testing participants.

Initially, a phone contact was established with people from the targeted firms to investigate their willingness to participate in the study. Totally, 500 firms, mainly located in Northern Greece, were contacted and 318 accepted to participate in this research. Respondents were identified after the nature of the study and information required had been explained to the manager of each firm. From them, 295 firms (92.7 percent) finally participated and successfully completed the research instrument. Questionnaire were distributed and returned between September and December 2008. Table II presents the profile of the research participants.

The theoretical model developed to test the alignment hypothesis was analyzed using multivariate statistical analysis, via SEM, using AMOS 7. Goldberger (1972, p. 979) describes that structural equation models as:

> [...] stochastic models in which each equation represents a causal link, rather than a mere empirical association. The models arise in nonexperimental situations and are characterized by simultaneity and/or errors in the variables.

Such techniques can be used to conduct tests of complex theory on empirical data (Brannick, 1995, p. 201). The data were analyzed following a two-step approach (Anderson and Gerbing, 1998); in the first step, confirmatory factor analysis (CFA) is performed to assess the adequacy of the measurement model, while in the second step the structural model is tested using SEM. The level of analysis is set at the firm.

Bagozzi and Yi (1989, p. 282) argue that SEM has the following advantages over other (traditional) statistical analysis methodologies:

> First, the new procedures are more general and do not involve the restrictive assumption of homogeneity in variances and covariances of the dependent variables across groups [...] Second, the new procedures provide a natural way to correct for measurement error in the measures of variables and thus reduce the chances of making type II errors [...] Third, structural equation models allow for a more complete modeling of theoretical relations, whereas traditional analyses are limited to associations among measures. Fourth, covariates in step-down and MANCOVA analyses can be treated as latent variables with the new procedures, thereby permitting a correction for attenuation and increasing the chances that valid experimental effects will be detected. The traditional procedures cannot take into account measurement error in covariates. Finally, structural equation models constitute flexible, convenient procedures. They not only perform tests of experimental effects and homogeneity, but are special cases of very general programs and easily implemented.

4. Data analysis and results

4.1 The measurement models

In order to assess the construct validity (convergent and discriminant validity) a CFA was performed (Muttar, 1985). According to Hair *et al.* (1995), Kaiser-Meyer-Oklin (KMO) measure of sampling adequacy and Barlett's test of sphericity are the measures that are recommended for measuring construct validity. Straub *et al.* (2004) pointed out

	Statistics				
	Mean	SD		%	
Position			CEO	35.6	Department manager
			Branch manager	6	Line manager
Education			High school	19	University
					Postgraduate
Experience (years)	16	9.093			
Establishment date	1977	30.41			
Total number of employees			< 50	61.3	251-1,000
			51-250	26.3	> 1,000
Administrative employees	96	659.52			
Production employees	150	762.25			
Sector			Manufacturing	37.9	Tourism
			Commerce	28.4	Banking
			Construction	10.8	Services
Sales	€11 m		< €1 m	32.4	€10-50 m
			€1-10 m	44.4	> €50 m
Sales increase (%)	19.4%	32.24	− 10 to 0%	4.23	10-30%
			0-10%	47.7	> 30%
Market share (local)	40.8%	29.66	0-10%	17.7	31-50%
			11-30%	34.2	51-100%
Market share (national)	25.8%	27.49	− 10 to 10%	41.7	31-50%
			11-30%	30	50-100%
Market growth (%)	12.5%	16.57	− 15 to 0%	7.1	10-30%
			0-10%	56.6	> 30%
Growth of industry (%)	15%	29.20	− 15 to 0%	5.7	10-30%
			0-10%	60.8	> 30%
Competitive position	2.36	1.02	Leader	24.5	Small player
			Big player	29.4	Follower
			Competitive	32.9	

Table II.
Descriptive statistics

that Cronbach's α reliability test can be used to assess internal consistency of measurements. The total variance explained (TVE) score is also used to measure how data is distributed within a range and how much the responses differ.

Table III presents the results of the factor and reliability analyses. Focusing on these results, KMO is above the minimum accepted level of 0.5 (Hair *et al.*, 1995), while Cronbach's α is also at acceptable levels (threshold 0.6, Malhotra, 1999) for all constructs. Similarly, TVE score for all factors is satisfactory (above 0.5). Finally, factor loadings for all the items are acceptable and vary from 0.658 (proactiveness, third item) to 0.922 (IT planning and control, second item). It is important that only two out of the 53 items were discarded.

4.1.1 Strategic orientation. CFA was used to examine whether SO consists of all six factors included in the analysis. The results showed (Table IV) that two factors (aggressiveness and riskiness) should be excluded from the analysis (because of relatively low estimates or factor loadings). The overall model fit was evaluated using four fit measures: χ^2/d.f., goodness-of-fit index (GFI), comparative fit index (CFI) and root mean square error of approximation (RMSEA) (Smith and McMillan, 2001). The level of all the above indexes was within acceptable range indicating good fit of the measurement model.

4.1.2 Organizational structure. The same analysis for OS (measured using only five items), indicated (Table IV) that:

- "professionalization" should be excluded from the "OS" construct (item loading equals to 0.04); and
- there is a negative relationship between "administrative efficiency" and "OS".

This negative relationship between "administrative efficiency" and "OS" could be attributed to the culture of the Greek firms and the size of the firms included in the research sample. More specifically, most Greek firms are small to medium-sized family business, where decision making is a privilege of the family members and especially its leader. There are, therefore, very few hierarchical levels and a very loose "informal" OS. On the other hand, large firms usually establish formal OS with well-defined roles for each hierarchical level, which is also responsible for specific actions (decentralization – span of control). Although factor loadings are relatively low, the levels of all four fit measures are acceptable, indicating that the suggested model is appropriate for measuring OS.

4.1.3 Information technology. An intriguing relationship has been found when CFA was conducted to assess the validity of IT research factors (Table IV). The model fit indicators are acceptable and the results presented an internal relationship between "IT environmental scanning" and "IT strategy", implying that managers often scan their business internal environment, and only after that, do they plan and apply their IT strategy, in order to effectively reach their managerial goals. All factors initially examined are included in the final model for IT and all model fit indicators are within acceptable levels.

4.1.4 Firm performance. Table IV presents the results of the CFA conducted for FP. It can be noticed that "profitability" has the strongest loading (0.92) and ROA the weakest (0.69). It must also be noted here that "liquidity" has been removed from the CFA model because of its high relationship with "sales growth", to improve construct uni-dimensionality. Finally, all CFA model fit indicators are within acceptable levels.

Table III.
Construct validity

Construct	Factors	Statistics	Items	Loadings
SO	Aggressiveness	KMO = 0.729	We often sacrifice profitability to gain market share	0.838
		Bartlett's sig. = 0.00	Cutting prices to increase market share	0.878
		TVE = 65.245	Setting prices below competition	0.742
		Cronbach's $\alpha = 0.818$	Seeking market share position at the expense of cash flow and profitability	0.765
	Analysis	KMO = 0.862	Emphasize effective coordination among different functional areas	0.748
		Bartlett's sig. = 0.00	Information systems provide support for decision making	0.769
		TVE = 61.983	When confronted with a major decision. we usually try to develop thorough analyses	0.775
		Cronbach's $\alpha = 0.875$	Use of planning techniques	0.813
			Use of the outputs of management information and control systems	0.835
			Manpower planning and performance appraisal of senior managers	0.781
	Defensiveness	KMO = 0.648	Use of cost control systems for monitoring performance	0.798
		Bartlett's sig. = 0.00	Use of production management techniques	0.890
		TVE = 68.797	Emphasis on product quality through the use of quality circles	0.796
		Cronbach's $\alpha = 0.772$		
	Futurity	KMO = 0.784	We emphasize basic research to provide us with future competitive edge	0.731
		Bartlett's sig. = 0.00	Forecasting key indicators of operations	0.803
		TVE = 63.339	Formal tracking of significant general trends	0.732
		Cronbach's $\alpha = 0.803$	"What-if " analysis of critical issues	0.747
	Proactiveness	KMO = 0.612	Constantly seeking new opportunities related to the present operations	0.788
		Bartlett's sig. = 0.00	Usually the first ones to introduce new brands or products in the market	0.768
		TVE = 54.784	Operations in larger stages of life cycle are strategically eliminated	0.658
		Cronbach's $\alpha = 0.575$		
	Riskiness	KMO = 0.701	We seem to adopt a rather conservative view when making major decisions	0.69
		Bartlett's sig. = 0.00	New projects are approved on a "stage-by-stage" basis rather than with "blanket" approval	0.794
		TVE = 57.364	A tendency to support projects where the expected returns are certain	0.751
		Cronbach's $\alpha = 0.743$	Operations have generally followed the "tried and true" paths	0.790

(*continued*)

Table III.

Construct	Factors	Statistics	Items	Loadings
IT	IT environmental scanning	KMO = 0.734	Instituting a technology watch in order to change rapidly your IT when necessary	0.873
		Bartlett's sig. = 0.00	Knowing the information technology used by your competition	0.910
		TVE = 80.816	Ensuring that your choice of information technology follows the eution of your environment	0.913
		Cronbach's α = 0.879		
	IT strategy	KMO = 0.867	Use of IT to reduce your production costs	0.806
		Bartlett's sig. = 0.00	Use of IT to make substantial savings	0.861
		TVE = 69.375	Use of IT to improve your firm's productivity	0.881
		Cronbach's α = 0.910	Use of IT to increase your firm's profitability	0.873
			Use of IT to improve the quality of products	0.813
			Use of IT to improve the quality of services	0.757
	IT planning and control	KMO = 0.877	Having the required human and organisational resources to manage the information systems	0.859
		Bartlett's sig. = 0.00	Having the ability to effectively identify the needs in information technology	0.922
		TVE = 73.399	Having the ability to effectively fill the needs in information technology	0.873
		Cronbach's α = 0.906	Strategic planning of information systems in relation to the organisation's business objectives	0.760
			Mastering the technology presently in use in your organisation	0.862
	IT acquisition and implementation	KMO = 0.831	Use of specific selection criteria for the acquisition of new information systems	0.876
		Bartlett's sig. = 0.00	Choosing information technology related to the SO of your firm	0.900
		TVE = 64.482	Knowing the results of a financial feasibility study before the acquisition of IT	0.910
		Cronbach's α = 0.844	Evaluating the employee's aptitude to use the chosen IT	0.854
FP		KMO = 0.778	ROA	0.828
		Bartlett's sig. = 0.00	Sales growth	0.831
		TVE = 68.689	Profitability	0.901
		Cronbach's α = 0.844	Liquidity	0.749

Hyper-construct	Constructs	Factor loading	CMIN/df	GFI	CFI	RMSEA
SO	Aggressiveness	–	1.951	0.978	0.982	0.057
	Analysis	0.80*				
	Defensiveness	0.72*				
	Futurity	0.87*				
	Proactiveness	0.75*				
	Riskiness	–				
Organizational structure	Formalization	0.54*	1.244	0.999	0.996	0.009
	Professionalization	–				
	Centralization	−0.40*				
	Vertical differentiation	0.69*				
	Specialization	0.57*				
Information technology	Environmental scanning	0.73*	6.071	0.990	0.993	0.131
	Strategy	0.71*				
	Planning and control	0.90*				
	Acquisition and implementation	0.93*				
FP (financial)	ROA	0.69*	6.252	0.981	0.978	0.134
	Sales growth	0.77*				
	Profitability	0.92*				
	Liquidity	–				

Note: Significant at: $^{*}p < 0.001$

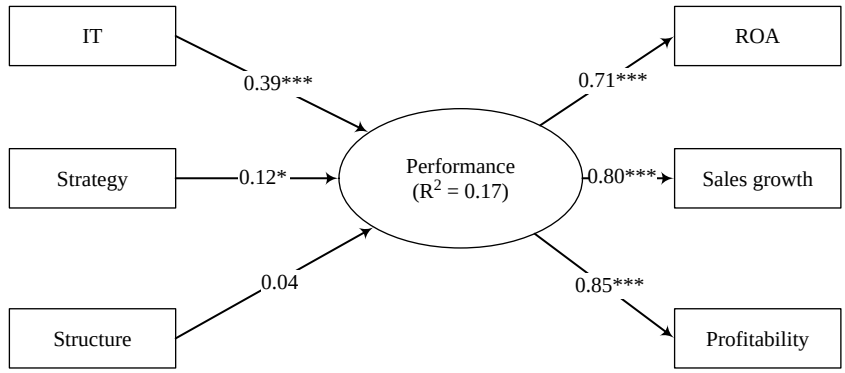
Table IV.
Second-order CFA for the SO, OS, IT and business performance hyper-constructs

4.2 Testing the alignment hypothesis: the structural models

To test the alignment hypothesis, data were analyzed in three steps. Initially, the individual effects of the exogenous constructs, namely IT, SO and OS, on performance were examined (Figure 2). The results of the analysis indicated that, while IT and SO have a statistically significant effect on performance (0.39, $p < 0.001$ and 0.12, $p < 0.05$, respectively), the direct effect of OS on performance was insignificant. These finding is in line with the study of Byrd *et al.* (2006), who also found that IT and SO are positively related with FP. With respect to structure, a study by Pelham and Wilson (1996) also indicated a weal effect of structure on performance in small firms. Finally, fit indices indicated that the model, as it stands, has poor fit to the data (none of the indices is above the suggested cut-off values), while R^2 for performance is 0.17.

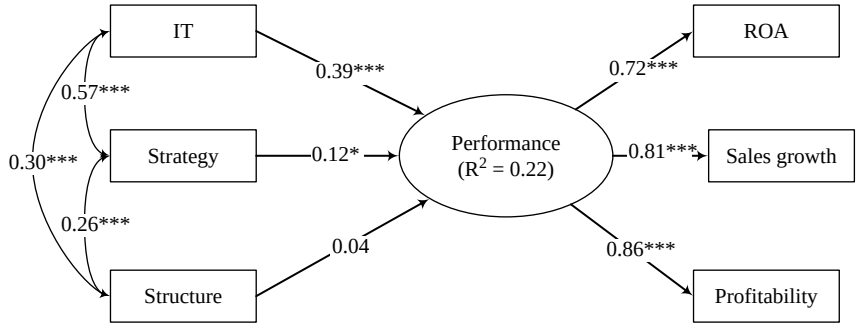
At a second stage, the exogenous constructs of the model were allowed to freely covary (Figure 3). The analysis indicated that in this model has good fit to the data, while the explained variance in performance increased by 5 percent ($R^2 = 0.22$). The effect of OS on performance remains insignificant, but analysis showed relatively strong and statistically significant covariances among the exogenous constructs. The latter was a first indication of a strong association among IT, SO and OS. Such associations have also been reported by Henderson and Venkatraman (1999), Croteau and Bergeron (2001), Croteau *et al.* (2001) and Chan and Horner (2007).

Finally, the three constructs were regarded as facets of a single construct, i.e. organizational performance. The examination of the third structural model has produced some interesting results (Figure 4). First, IT remains the factor with the strongest loading (0.85) within the organizational alignment construct, as was also indicated by the previous analyses. Second, the loading of SO has been significantly strengthened (0.67), while OS has a relatively weak loading, but its effect also has been



Model fit			
CMIN/DF	GFI	CFI	RMSEA
17.485	0.736	0.850	0.237
*** p < 0.001, * p < 0.05			

Figure 2.
Structural model 1



Model fit			
CMIN/DF	GFI	CFI	RMSEA
1.621	0.993	0.989	0.046
*** p < 0.001, * p < 0.05			

Figure 3.
Structural model 2

strengthened and has now become statistically significant (0.36). Further, there is a noteworthy relation between organizational alignment and performance ($r = 0.53$), implying that organizational alignment may indeed positively affect FP, as other researchers also found (Pollalis, 2003; Rivard *et al.*, 2006). The third model can explain a larger amount of variance in performance ($R^2 = 0.28$), compared to the preceding models tested.

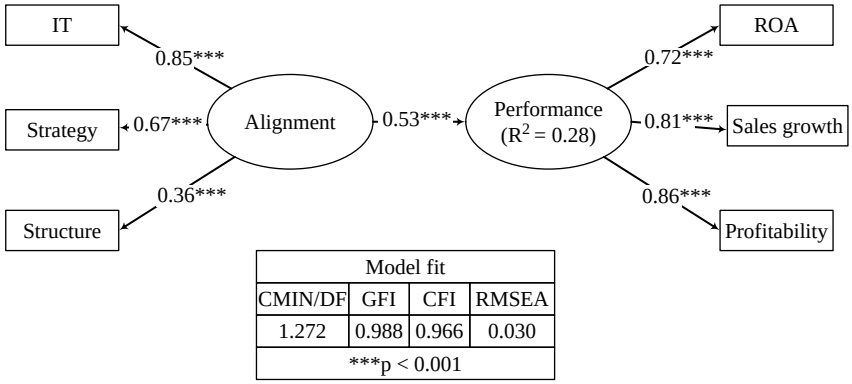


Figure 4.
Structural model 3

5. Conclusions and research limitations

5.1 Conclusions

This study has examined the relationships of SO, OS and IT with FP. The results of the analysis support the research hypothesis that IT, organizational strategy and OS have a stronger impact on performance when they are aligned, than when each of these is considered independently. Moreover, since the sample utilized comprises firms of all sizes (although the majority is very small), it can be argued that the impact of the organizational alignment on FP is significant, regardless the size of the firm and business industry that it belongs to, empirically supporting the suggestions of other researchers (Tallon and Kraemer, 1999; Bergeron *et al.*, 2001; Pollalis, 2003; Rivard *et al.*, 2006). Finally, results confirm the findings of the study conducted by Bergeron *et al.* (2004) in a North American context.

5.2 Managerial implications

From a managerial perspective, although SO, OS and IT affect business performance separately, their impact is significantly higher when they are aligned. More specifically, this study suggests that IT appears to be a key element in improving the coordination between organizational strategy and structure, as Tallon (2008) also points out. Thus, managers have to choose the appropriate IT infrastructure (related to their organizational strategy and structure) in order to facilitate the alignment of organizational strategy and structure. Further, managers have to make sure that IT is utilized in such a way to empower SO and OS. Also, managers have to draw firm's strategy in relation with firm's IT system and OS.

5.3 Research limitations/suggestions for further research

The first potential limitation of this research has to do with the sample size, which is considered as relatively small (295), although it is generally accepted that it is the right one for this kind of survey (Bergeron *et al.*, 2004). The second limitation is about the one-dimensional nature of performance measures (financial). Non-financial and intangible performance measurements should be included, so that a holistic view of a FP is examined (Copeland *et al.*, 1996; Dixon and Hedley, 1997; Young and O'Byrne, 2001; Herrmann, 2005). Another, possible limitation is the fact that the research sample is derived from firms belonging to various industries.

Finally, future studies could be designed to examine firms' inter-organizational relationships of SO, OS, IT and performance, using more advanced information intensity measurements and modeling techniques.

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Further reading

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