The Impact of Organizational Characteristics on IT-Business Alignment: A Field Study

Abstract

For over 30 years, studies have consistently acknowledged that Information Technology (IT) – business alignment is a pervasive and persistent problem. Over this time, research has focused primarily on conceptual alignment considerations. There has been little focus on the impact of organizational considerations on IT-business alignment. By examining certain characteristics, such as organizational structure or the reporting position of the Chief Information Officer (CIO) in the company, this research can produce insights and best practices to improve alignment and overall firm performance. By applying one of the better-known alignment models, the Strategic Alignment Maturity Model, this study applies an extensive data set including data from 1,051 Chief Information Officers and other top executives to investigate the effects of industry, geographic region, IT reporting structure and IT organization structure on IT-business alignment.

The results provide important insights on what does and does not enhance IT-business alignment. Overall, this research has found that while industry sector does not influence the level of IT-business alignment, company organizational structure does. Specifically, the research findings demonstrate:

(1) hybrid or federated IT organizational structures achieve significantly higher levels of IT-business alignment compared to other organizational structures

(2) centralized IT organizations achieve significantly higher levels of IT-business alignment compared to decentralized organizational structures

(3) CIO-CEO reporting structure leads to significantly higher levels of IT-business alignment maturity than CIO-CFO reporting structure, which leads to lower levels of alignment maturity.

The implications are clear; no industry is immune to the alignment conundrum and every industry has an opportunity to improve IT-business alignment. Furthermore, this research contributes new theory while assisting practitioners in providing specific guidance on how to enhance IT-business alignment.

Keywords: IT-Business Alignment, Strategic Alignment Maturity Model (SAM), IT Reporting Structure, IT Organization Structure.

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1. INTRODUCTION

For almost three decades, practitioners and academics have debated how to align Information Technology (IT) activities and operations with business activities and goals. Formidable researchers have proposed a myriad of models and methodologies to improve this alignment (e.g., Amarilli et al., 2017; Bergeron et al., 2001, 2004; Grant and Collins 2016; Henderson and Venkatraman, 1993; Hu and Huang, 2005; Jorfi et al., 2017; Luftman et al., 1993; Maes et al, 2000; Marchand et al., 2001; Reich and Benbasat, 1996, 2000; Reynolds and Yetton, 2015; Tallon and Kraemer, 1998; Teo and King, 1996, 1997; Ullah and Lai, 2011). Yet, despite extensive research, alignment remains a pervasive and persistent top challenge to organizations (Luftman et al., 2017; Alghazi et al., 2017; Gerow et al., 2015; Queiroz et al., 2018).

One reason for the conundrum is that past research has lacked a clear operational conceptualization of IT-business alignment. In addition, alignment studies present mixed results on how organizations are implementing IT-business alignment in day-to-day practice and its impact (Tallon 2003; Chen et al., 2010). The IT literature generally show that organizations that exhibit IT-business alignment generate a sustainable competitive advantage and perform better than organizations that do not (see, for example, Baker et al., 2011; Sabegh and Motlagh, 2012). However, despite significant work in this area, studies do not reveal what specific organizational characteristics are associated with better IT-business alignment. If certain characteristics, for example, organizational structure or the position of the Chief Information Officer (CIO) in the company, had a positive impact on IT-business alignment, research could prescribe best practices and ways to improve alignment. However, while much research has been debating on the definition of alignment (see, for example, Preston and Karahanna, 2009; Gerow et al. 2014; Chan and Reich, 2007), little research has been conducted on the organizational elements that influence this alignment. Therefore, reconciling the question of what organizational characteristics are associated with enhanced alignment remains.

To alleviate this question, this research investigates an encompassing well-established and validated activity-based construct of IT-business alignment using the concept of alignment activities and their scope and extent as a measure of alignment. Alignment activities are comprised of the managerial behaviors and operations, which are likely to coordinate and 'harmonize' the activities and operations within the business domains and those within the IT domain. The alignment construct is comprised of six dimensions, where each dimension taps into a distinct set of activities contributing to IT-business alignment. By doing so it carves out a more comprehensive and dynamic characterization of IT-business alignment and offers a broader operational conceptualization of the ways to attain improved IT alignment.

Using the construct, we assess how organizational characteristics, such as industry sector, geographic region, IT reporting structure and IT organization structure impact IT-business

alignment. Many researchers have examined these pivotal relationships. However, previous research has progressed with a single industry focus. For example,

- Ullah and Lai (2011) focused on the automobile industry
- Byrd et al., 2006, and Weill, 1992, examined a group of manufacturing firms
- Chan et al., 1997, and Ittner et al., 2003, focused on financial services firms
- , Company type focus (e.g., Hussin et al., 2002, studied IT alignment in small firms)
- Specific geographic focus (e.g., Henderson and Venkatraman, 1993, considered companies in North America; Cumps et al., 2006, investigated European companies).

This study presents an empirical analysis that applies a more encompassing sample that includes numerous industry sectors, geographic regions, and varying organizational structures. Moreover, it covers data over a 13-year period and represents alignment data concerning 1,051 IT executives from 345 companies within 6 regions and 18 countries.

This work aims to be both academically rigorous and relevant to practice. It opens a new horizon for researchers and practitioners to leverage IT. Executives can use the results of this investigation and the model employed in this work to articulate more comprehensive action plans for attaining greater IT-business alignment, thus enhancing IT's effect on the business, as well as the overall success of the business. This, in turn, can lead to better company performance and organizational outcome.

The next section (Section 2) discusses the concept of IT and business strategy alignment, presents the state of the art of measuring IT-business alignment, and introduces the model employed in this study. Section 3 articulates the study's hypotheses. Section 4 outlines the study's methodology while Section 5 reports main findings. Section 6 discusses the results, notes limitations and suggests directions for future research.

2. LITERATURE REVIEW

2.1. The Concept of IT-Business Alignment

The idea of IT-business alignment has been expressed using multiple terms such as 'fit' (Venkatraman, 1989), 'harmony' (Luftman et al., 1993), 'fusion' (Smaczny, 2001), 'integration' (Weill and Broadbent, 1998), and 'linkage' (Henderson and Venkatraman, 1993). This study considers all of these terms as synonymous, and views alignment as the idea of coordinating activities across IT and non-IT domains within the firm in ways that are likely to provide new services, improve business processes and decision-making and thereby increase the business value of the firm. Furthermore, alignment is not a question of being aligned or not being aligned, rather it is how this relationship needs to be adjusted (and enhanced) based on business contingencies.

For over three decades surveys on IT management have consistently ranked the *lack* of alignment as one of the top organizational challenges (e.g., Kearns and Sabherwal, 2007; Preston and Karahanna, 2009). Consequently, many researchers view alignment (or its absence) a persistent problem (Chan and Reich, 2007; Luftman, 2005; Luftman and Kempaiah, 2008;

Luftman and McLean, 2004; Luftman et al., 2006, Luftman and Zadeh 2011). In the quest for IT-business alignment, studies have been investigating various aspects of this alignment including:

- what is IT-business alignment
- how to identify such alignment
- what antecedents can explain this outcome and what the consequences of the level of alignment might be

Yet, the alignment challenge remains, largely because studies of IT-business alignment have been too conceptual and lacked good measures (Luftman et al., 2017). Nevertheless, it is noteworthy that the level of alignment has demonstrated some improvements over the years (Luftman and Ben-Zvi, 2010; Luftman et al., 2013).

2.2. The State of the Art of Measuring IT-Business Alignment

Past empirical research on alignment suffers from several shortcomings. For a recent review, see Gerow et al. 2014 to see that there is:

- a tendency to look at alignment as a singular state or relationship rather than a dynamic composite of multiple distinct dimensions
- no unified agreement on what alignment truly means and how it can be detected
- the consideration that there are many constructs that are too complicated and difficult for IT and business executives to evaluate the current level of alignment in their organization and to improve it (Luftman and Ben-Zvi 2011, 2010; Luftman and Kempaiah, 2008; Luftman et al. 2010).

Therefore, more practical, and academically grounded models are necessary.

The literature examines alignment from multiple perspectives- principally strategic, structural, social, and cultural. This research focuses on the dominant strategic perspective (see Gerow et al 2014 for key definitions) which examines the degree to which the business and IT strategy and plans (external integration) complement each other through intellectual alignment and to what extent related IT and business infrastructures are aligned (internal and cross-domain integration) through operational alignment. Past investigations have found that alignment is contingent upon the type of strategy, industry, governance structure or the social and the cultural aspects of the organization (Gerow et al 2014, Reich and Benbasat, 1996). Consequently, the literature covers an array of different approaches to assess alignment, including case studies, fit models, surveys, conceptual models, and quantitative assessments. The meta-analysis reviews of Chan and Reich (2007) and Gerow et al (2014) provide a good summary of much of the literature in this area.

Most alignment models and ideas of external and internal integration are based on Henderson's and Venkatraman's (1993) seminal conceptual model that defines four necessary static elements that need to be aligned for business IT alignments: (1) business strategy; (2) IT strategy; (3) organizational infrastructure; and (4) IT infrastructure. The model describes the alignment relationships in terms of the quality of the interactions between the four elements. Accordingly, the authors suggest a distinct alignment process (intellectual, operational) for each

of the four relationships. The model, however, was purely conceptual and offered no means to analyze and detect alignments and their levels.

Henderson's and Venkatraman's model was later expanded with several measures to detect the level of alignment. Luftman, for example, (1996) augmented the model with eight mechanisms that would contribute to alignment in each dimension; Maes et al (2000) proposed a framework for measuring alignment levels for each of the four dimensions and incorporated functional and strategic layers into the model as to reflect the need for sharing alignment related information. Bharadwaj et al. (2013) expanded this line of thinking and identified four key themes related to alignment in today's digital business: the scope of digital business strategy, the scale of digital business strategy, the speed of digital business strategy, and the sources of business value creation and capture in digital business strategy. These models, however, do not offer detailed ways of establishing content, face, discriminant and convergent validity. In the past decade, both Chan and Reich (2007) and Gerow et al. (2014) conducted meta-analysis studies to assess the cumulative findings concerning the impact of each alignment's dimension on performance. They observed two principal alignment classifications: 'Fit models' and 'Single measures'. Fit models rate business strategies and IT strategies separately (often through a questionnaire) and then determine the fit between the two along the dimensions to determine the level of alignment. Single measures are based on Likert type scales which directly capture the respondent's perception of alignment in their organization, typically along the three dimensions, intellectual/operational/cross-functional, of Henderson and Venkatraman (1993) model. The most common type of measure has been single-respondent-single measure study which has looked at a static alignment between IT and business strategy. Table 1, adopted from Luftman et al. (2017), summarizes important streams of research, their insights and findings, and their pertinent strengths and weaknesses. The table is not comprehensive, but offers a good representative sample of key studies and their profiles and thus captures the state of the field. The studies are listed separately as conceptual studies (focus on the concept and construct of alignment), empirical studies (studies that sought to detect the level of alignment and either its antecedents or its consequences), and practice oriented studies.

Table 1. A Review of Alignment Research and Measures

Authors	Construct Nature	Operationalization	Model Strengths	Model Weaknesses
Conceptual Studies				
Henderson and Venkatraman (1993)	A concept based on strategic fit and functional integration	Four domains of strategic alignments: • Business strategy • IT strategy • Organizational infrastructure and processes • IT infrastructure and processes	Focuses on the nature of IT capabilities and organization designs that enable to exploit the business potential of IT through aligning four dimensions	• Conceptual • Lacks diagnostics • Neglects how companies are able to achieve alignment
Broadbent and Kitzis (2005)	How to weave together business and IT strategies and what related factors influence the success of IT-enabled business projects	Four factors influence alignment • A Chief Information Officer • An executive team with informed expectations for an IT-enabled enterprise. • Clear IT governance • Adopting portfolio management approach.	A conceptual model discussing elements which provide necessary building blocks for business-IT linkages	• Conceptual • Generic • Lacks empirical validation
Maes et al. (2000)	Aligning business and IT is a matter of management and of design. The model is derived from a generic framework for information management and an integrated architecture framework	• Management (strategy, structure, operations) • Areas of concern (business, information and communication, technology systems infrastructure) • Design	A unified framework of alignment	• Conceptual High level model • Does not examine how companies achieve alignment
Empirical Studies				
Brown and Magill (1994)	Explores the concept of IS and organizational design patterns of internal and external antecedents	Examining a firm's IS organization design decision for a decentralized, centralized, or hybrid structure	A conceptual framework for IS and organization design and its assessment	• Narrow scope focusing on organizational design • Little empirical evidence (N=6)
Sabherwal and Kirs (1994)	Alignment between critical success factors and IT capability	• Environmental uncertainty • Organizational integration • IT management sophistication	Alignment defined between business factors and IT capability and their impact on overall performance	• Empirical study focused on academic institutions • Limited number of alignment variables • Empirically-derived ideal profile of IT capability • Adopted a static view of alignment
Hussin et al. 2002	The alignment between the contents of business and IT strategies	Three factors influencing alignment: • CEO commitment to IT • IT sophistication • External IT expertise	Exclusively measures the fit between IT strategy and the business strategy	• Limited number of alignment factors • Excludes processes associated with IT alignment, such as functional integration, organizational factors, etc.
Bergeron et al. (2001)	Alignment of strategic IT management, environment uncertainty, strategic orientation and structural complexity	Six 'fit' perspectives: • Moderation • Mediation • Matching • Covariation • Profile deviation • Gestalts	Describes how different conceptualizations and analysis methods of fit lead to different results	• Small sample size N=110 • No theory foundation

Reich and Benbasat (1996)	Analyze the social dimension of business-IT alignment	• Cross references between written business and information technology plans • IS and business executives' mutual understanding of each other's current objectives • Congruence between IS and business executives' long-term visions for information technology deployment • Executives' self-reported rating of linkage	Provides a scheme that shows different ways of conceptualizing and identifying short- and long-term aspects of the social dimension of alignment	• Limited only to the social dimension of alignment • Very small data sample: 10 business units in only one industry - life insurance
Gerow et al 2014	Meta-analysis of effects of alignment on firm performance	• Three domains (internal, cross-domain, external) of integration • Intellectual and operational alignment • Thee domains of effect: financial performance, productivity, customer benefit • Contextual variables of -Turbulence -strategy type -governance -social alignment - IT investment level	Extensive and systematic analysis of 71 studies of impact of alignment on performance • Alignment dimensions are highly correlated • Alignments dimensions have positive effect on performance – most consistent for productivity and financial performance • Contextual variables influence the level of alignment	- Static view of alignment dimensions - Rough and often poorly developed scales for alignment dimensions - Only few studies looked at operational or cross-domain integration which is often critical for value creation
Practice Oriented Studies				
Luftman (1996)	Alignment is concerned with relationships among the twelve components that define business-IT alignment	Twelve alignment components: Business Scope, Distinctive Competencies, Business Governance, Organization Infrastructure and Processes, Administrative Structure, Organization Infrastructure and Processes: Skills, Technology Scope, Systemic Competencies, IT Governance, IT Infrastructure and Processes, IT Infrastructure and Processes Architecture, IT Infrastructure and Processes Skills	Provides practical method of improving alignment ("rules of thumb")	• Lacks a theoretical basis (the process leading to alignment and how to measure alignment) • Ignores relationships between 12 components
Luftman et al. (1999)	Identifies functional areas that promote or hinder alignment of IT plans with business plans	Enablers: Senior executive support for IT, IT involved in strategy development, IT understands the business, Business - IT partnership, Well-prioritized IT projects, IT demonstrates leadership Inhibitors: IT/business lack close relationships, IT does not prioritize well, IT fails to meet its commitments, IT does not understand business, Senior executives do not support IT, IT management lacks leadership	The areas identified as enablers and inhibitors considered common across industries, business functions, and across time.	• Lacks stronger a theoretical basis

Overall, the summary shows that IT-business alignment studies are limited in sample sizes and usually cover one industry or one location at a time, which casts doubts of the generalizability of the findings. In addition, research has focused on how well companies have achieved the alignment, or on how to measure (static) alignment (Hussin et al., 2002). It is deficient, however, in identifying what organizational characteristics impact alignment and in providing insights that would suggest ways to improve alignment.

We address these gaps by studying a well-established, practical alignment model composed of six distinct activity dimensions (each with several sub-dimensions). The model itself and each of its dimension are grounded in theory of capabilities. Several previous studies (see, for example, Luftman et al. 2017 and El-Masri et al., 2015) have validated the impact of each of the six dimensions on IT-business alignment, both individually and collectively, thus confirming the validity of the model. We employ the model to investigate several organizational characteristics that affect alignment. The investigation uses comprehensive empirical evidence from numerous different industries, six (6) global regions, and 18 different countries, covering a 13-year period, thus addressing the gap in the literature in terms of generalizability of the results. The findings of this study provide important insights for managers to improve the level of alignment; the construct has conceived managerial practices that are viable in practice to align business and IS (El-Masri et al., 2015).

2.3 The IT-Business Alignment Model: Strategic Alignment Maturity (SAM)

The starting point for the model we use in this study is Luftman's et al. (1999) investigation of enablers and inhibitors of IT-business alignment. Based on interviews with Chief Information Officers (CIOs), IT managers, and functional (non-IT) managers, their field research identified several areas that promote or inhibit IT-business alignment. It thereby enlisted salient activities that management need to carry out or mitigate to achieve goals concerning coordinated IT deployment across the organization. This list of enablers and inhibitors provided the framework for the generic model that identifies a set of capabilities that enable, enhance or mitigate IT-business alignment (Luftman, 2000). While developing the model, the author carefully reviewed the extant literature on IT and business related activities for theoretical triangulation. This resulted in an extensive typology of activities deployed by either the IT function, business functions, or both in relation to developing, using or monitoring IT and thereby achieving alignment. Only those activities, which repeatedly had been showing to have a strategic effect (see, for example, Luftman et al. 2008) were included in the final typology, offering a tentative classification of IT and business related activities promoting IT-business alignment.

Contrary to past research in this area, the model does not view IT-business alignment as a singular (though varying) state along its dimensions, but rather a continuous process of adjusting activities across multiple dimensions, which together results in a better alignment. Therefore, in contrast to taking an evaluative or summative approach to alignment, the model approaches alignment as a formative, holistic construct that examines what types of activities *jointly* result in improved alignment. Accordingly, the name Strategic Alignment Maturity (SAM) [1] model because it captures the scope and the level of activities through which the IT function and business functions engage to enable or drive the firm's value adding activities when IT is a necessary component.

[1] This is not to be confused with the Henderson Venkatraman (1993) Strategic Alignment Model (SAM).

Since the focus of SAM is on activities deployed by IT and/or by business functions, at the outset, the model may appear to be operational. Yet, it is in line with the strategic idea of (dynamic) capabilities and their foundations in enabling or driving higher revenues due to competitive advantage. Indeed, SAM focuses primarily on observing the scope and extent of activities that drive and enable strategic alignment between business and IT. Examples of such activities include:

- positioning correctly the role of IT in strategic business planning
- achieving adequate level of collaboration between IT and business as to identify and develop strategic initiatives
- seeking mutual understanding of IT by the business and business by IT through constant effective communications as understand its role in value generation
- acknowledging and evaluating the financial and business impact of IT on company performance

These activities, among others, lead to mutual commitments about the direction of IT and business between top management and IT management, especially when combined with presence of effective tactical and operational IT processes.

A six dimensional (formative) construct along which IT-business alignment activities are organized provide the foundation of the SAM model. These dimensions are as follows: (1) Communications; (2) Value Analytics; (3) IT Governance; (4) Partnership; (5) IT Scope; and (6) IT Skills development. Table 2 summarizes the six dimensions.. Each of these dimensions has demonstrable criteria defined to improve IT–business alignment. The model is also multi-level in that each dimension is composed of several sub-dimensions - a set of varied activities. Overall, 41 different types of organizational activities are identified along the six dimensions. Each sub-dimension is measured through a set of items which tap into the level of mutual activities (from low to high) involved by the IT and business executives in that sub-dimension.

Several studies examined the validity of the SAM model and found it to hold well, being a good predictor of firm performance (see, for example, Luftman and Kempaiah, 2007; El-Masri et al., 2015; Luftman et al. 2017). The SAM model also aligns well with an assertion made by Peppard et al. (2014) in a special issue on strategic management that strategic management research should move away from a macro focus towards a micro focus that "emphasizes the actual day-to-day activities, contexts, processes and content that relate to strategic outcomes". Moreover, while Sledgianowski et al. (2006) developed and validated the model to measure the maturity of IT-business strategic alignment mechanisms, Chen (2010) cross-validated the model to evaluate company alignment maturity. In addition, Belfo and Sousa (2013) indicated that SAM was one of the most promising instrument in the IT-business alignment research in terms of validity.

Table 2. The SAM Dimensions

Dimension definition	Sub-Dimensions (Indicators)
Communications measures the level and effectiveness of the exchange of ideas, knowledge, and information between IT and business organizations which enables both to understand the respective strategies, plans, business and IT environments, risks,	C1 -Understanding of Business by IT C2 -Understanding of IT by Business C3 –Inter-organizational Learning/Education

priorities.	C4 -Protocol Rigidity C5 -Knowledge Sharing C6 -Liaison Effectiveness
Value Analytics taps into the level of using metrics to demonstrate the contributions of information technology and the IT organization to the business in ways that both the business and IT understand and accept.	M1 -IT metrics M2 -Business Metrics M3 -Integrated IT and Business metrics M4 -Service Level Agreements M5 –External Benchmarking M6 -Formal Assessments/Reviews M7 -Continuous Improvement M8 -IT function contribution
IT Governance defines formal processes around IT decisions and the level of discipline which IT and business manager's use at strategic, tactical, and operational levels in setting IT priorities and allocating IT resources.	G1 -Business Strategic Planning G2 -IT Strategic Planning G3 -IT Organizational Structure G4 -IT Reporting G5 -IT Budgeting G6 -IT Investment Decisions G7 -Steering committee G8 -IT Prioritization Process G9 -IT Reaction Capacity
Partnership gauges the scope and level of activities to enhance the working relationships between business and IT. It; includes, the degree of trust and how each perceives the other's contribution.	P1 -Business Perception of IT Value P2 -Role of IT in Strategic Business Planning P3 -Shared Goals, Risk, Rewards/Penalties P4 -T Program Management P5 -Relationship/ Trust Style P6 -Business Sponsor/Champion
IT Scope measures the level of IT's provisioning activities that promote creation of a flexible IT infrastructure, its evaluation and application of emerging technologies, activities that enable or drive business process change, and activities that deliver valuable customized solutions to business units.	A1-Traditional, Enabler/Driver, External A2 -Standards Articulation A3 -Architectural Integration A4 -Architectural Transparency to Changes A5 -IT infrastructure flexibility
IT Skills Development captures critical human resource activities, such as hiring, retention, training, performance feedback, innovation encouragement, career opportunities, and individual skill development. It also covers activities that promote to IT organization's readiness for change, learning, and ability to leverage new ideas.	S1 -Innovative Entrepreneurial Environment S2 -Cultural Locus of Power S3 -Change Readiness S4 -Career Crossover S5 –Training/Talent improvement to Learn S6 -Interpersonal Interaction S7 -Hiring and Retaining

3. HYPOTHESES

3.1. The Impact of Industry Sector on IT-Business Alignment

This research aspires to examine various organizational characteristics and their potential impact on IT-business alignment. Industry sector is one of those characteristics. The importance of this evaluation is because we often hear from industry executives that "my industry is different" or "my industry is special" and it is important to understand if this is or is not true. In addition, although anecdotally, executives argue that different industries have a different impact on alignment; this is the first study that empirically measures the difference between industries in

terms of alignment. Over the years, IT-business alignment has been investigated mainly within a single industry. For example:

- chemical manufacturers - Sledgianowski and Luftman (2005)
- insurance - Harris and Katz (1991)
- automobile - Ullah and Lai (2011)
- academic institutions - Sabherwal and Kirs (1994) ;
- financial services - Chan et al., (1997) and Ittner et al. (2003)
- manufacturing - Wiedemann and Gewald (2017)
- healthcare - Pereira et al. (2014)

As evidenced, there has been extensive alignment research in various industry sectors. These studies provide similar findings on alignment in each of the respective industry sectors. Nevertheless, we are not familiar with studies empirically examining large datasets that investigate differences across industries in terms of alignment. However, based on the industry-specific studies, one may conclude that alignment is a long-standing conundrum independent of industry sector. Therefore, we hypothesize:

H1: Industry sector does not influence the level of IT-business alignment.

3.2. The Impact of Geographic Region on IT-Business Alignment

Researchers have shown that maturity frameworks, such as IT Infrastructure Library (ITIL), IT Service Management (ITSM) and CMMI have a positive impact on IT-business alignment. For example, Soja (2012) stated that one of the key concepts of ITSM was the alignment between IT and business. Marrone and Kolbe (2011) conducted a survey that examined the benefits that ITIL provided to organizations. The authors concluded that as the maturity of ITIL increased, so did the IT-business alignment. Similarly, Winkler et al. (2014) showed how the widespread adoption of ITSM and ITIL frameworks promotes IT-business alignment. Welke et al. (2011) suggested that IT-business alignment supports the activities that help organizations achieve higher maturity levels in terms of CMMI.

Statistically, Asian companies (with a large number of Chinese and Indian companies) today comprise most of Capability Maturity Model Integration (CMMI) appraisals: 60% of all appraisals world-wide in the past decade, and 70% in 2017 alone, compared to only 25% of appraisals coming from North America in the past decade and only 20% in 2017. Asian companies also top the list with the highest CMMI scores (CMMI Institute, 2017).

Similar to industry, geographic regions have not been examined for their different impact on IT-business alignment. Yet, we often hear when working in different geographies that “my country is different” or my country is unique” and it is thus significant to see if this is or is not true. Alignment studies usually concentrate on one region (e.g., Europe) or one country (e.g., China), but they do not measure whether the geographic region is a factor that contributes to alignment. Studies investigating IT-business alignment measured alignment in different regions include organizations from;

- Europe - Cumps et al. (2006)
- North America - Henderson and Venkatraman (1993)
- Ireland - Enns and McDonagh (2012)
- China - Wang et al. (2011)
- Portugal - Pereira et al. (2014)
- Taiwan - Wu et al. (2015)

Nevertheless, there does not seem to be any study that has looked at the differences in IT alignment across geographical regions. Yet, with a rapid growth of CMMI appraisals coming from Asia, and the positive relationship between maturity frameworks and IT-business alignment found in the literature for Asian companies, it is hypothesized that:

H2: Asian companies present the highest levels of IT-business alignment.

3.3. The Impact of the IT Organizational Structure on IT-Business Alignment

Several studies have argued that how the IT function in a company is organized affects IT-business alignment (see, for example, Brown and Grant, 2005; Huang et al. 2010). The relationship between IT organizational structure and strategic alignment expresses fundamentally the degree of structural fit between IT and the business, specifically in IT decision-making rights, reporting relationships, (de)centralization of IT services and infrastructure, and the deployment of information systems personnel (Chan 2002, Chan and Reich, 2007). Furthermore, organizational structure has an important role in creating IT business value (Wiengarten et al., 2013), which is an alignment consideration.

IT organizational structure alternatives are comprised of three principle archetypes: centralized, decentralized, and federal/hybrid (Brown and Mcgill, 1994; Xue et al., 2008). Studies have shown that an appropriate organizational structure within IT is likely to be important in shaping alignment activities (Brown and Mcgill, 1994). The goal of structural fit is to support general organizational objectives and not to work against them (Chan, 2002). Moreover, organizational considerations have become more important of late as more and more organizations are leveraging IT for revenue generating initiatives, which demands a more harmonious relationship across organizations, with IT often reporting directly to the business unit.

A centralized IT function creates scale benefits for IT such as improved productivity, cost reductions, and better resource utilization (Levina and Ross, 2003; Sambamurthy and Zmud, 1999). A centralized IT structure provides opportunities to better promote efficient IT use (Huang et al. 2010). Companies tend to adopt a centralized structure when their strategies emphasize efficient business operations (Weill and Ross, 2005). Wu et al. (2015) conclude that centralized IT encourage a high degree of standardization, promoting higher profitability and improved operational excellence. All of these outcomes provide improved IT-business alignment (Cuenca et al. 2011; Silvius, 2010; Wu et al. 2015). Thus, under specific circumstances, the centralized structure can be associated with a better strategic alignment fit between the business and IT.

In contrast, a decentralized organization structure provides more autonomy across different business units enabling them to achieve their goals rather than the central IT functions goals (Brown and Magill 1994; Sambamurthy and Zmud 1999). That is, a decentralized IT structure can increase business value by increasing the unit's flexibility to respond to market demands (Reynolds and Yetton, 2015). This makes the organizational IT structure less effective in terms of IT-business alignment, as decentralization is appropriate when decisions and departments are modularized (Tiwana and Konsynski, 2010). Thus, this research posits:

H3a: Centralized IT organization achieves higher levels of IT-business alignment than a decentralized organization structure.

A hybrid (or federated) IT structure combines the centralization of some units or functions and the decentralization of others. This type of structure could then have a positive impact on IT-business alignment. To be more specific, the decentralized units favor activities related to three of SAM's dimensions: communications, analytics and partnerships (see, for example, Brown and Magill 1994; Sambamurthy and Zmud 1999), while centralized units favor other dimensions: IT governance, IT scope and IT skills development (see Levina and Ross, 2003; Sambamurthy and Zmud, 1999).

Brown and Magill (1994) argued that although the hybrid structure might lead to conflicts between the center and the various business units, the hybrid combination of centralized and decentralized units could potentially benefit from the two 'worlds' – centralized and decentralized – and produce the most effective results in terms of IT-business alignment. Nevertheless, empirical data is not available to substantiate their hypothesis. Thus, it is posited that

H3b: Hybrid/Federated IT Organizational Structures present the highest levels of IT-business alignment.

3.4. The Impact of the CIO's Position on IT-Business Alignment

Companies started to create the position of Chief Information Officer (CIO) in the early 1980s (Synnott and Gruber 1981). This head of IT position is in response to recognizing the increased importance of IT and realization that information can provide the organization with a competitive advantage (Benjamin et al., 1985). Yet, even after more than 30 years, the role of CIOs varies among firms, as well as the position or unit to whom CIOs report (e.g., Chief Executive Officer, Chief Financial Officer) (Gottschalk 1999; Hu et al., 2004). Studies show that about 40% of CIOs report to their Chief Executive Officer (CEO); the rest report to their Chief Financial Officer (CFO), Chief Operations Officer (COO) or other business unit executives (e.g., Luftman et al., 2015).

The respective reporting of the CIO has long been debated in industry and academia. The reporting structure has been shown to impact both the CIO's role (by promoting a vision for IT, exchanging ideas about IT initiatives, and assuring proposals are heard by the appropriate executive) and the firm's IT structure and strategic IT initiatives (Banker et al., 2011; Raghunathan and Raghunathan, 1993). The reporting structure also reflects how critical business leaders consider IT is contributing to the company's strategy and how much the company's culture appreciates or considers IT related factors (Benjamin et al., 1985; Jones et al., 1995).

While CIOs maintain formal and informal relationships with the top management team (Preston and Karahanna 2009), the direct reporting relationship facilitates easier access and stronger lines of communication with the focal C-level executive, which were shown to contribute to IT-business alignment (Luftman et al. 2017, Banker et al., 2011).

It is therefore conjectured that the CIO reporting structure has a significant impact on alignment. The CIO reporting to the CEO is an indication of the CIO's authority/power in the firm and that IT success is more likely if the CIO is closer to the CEO (see Luftman and Kempaiah 2008, Armstrong and Sambamurthy 1999). This reporting structure enables the CIO to promote a vision for IT, exchange ideas about IT initiatives, and assure proposals are heard by the appropriate executive, thus facilitating the CIO's role (Csaszar and Clemons, 2006; Preston and Karahanna, 2009). Furthermore, a reporting structure where a CIO reports directly to the CEO indicates that the company is more likely to have a more formal IT strategy and thus, an associated governance. It would also demonstrate a strategic IS orientation and greater IS planning levels, resulting in better IT scoping, value analytics and skills development (Hu et al., 2004). Thus, we posit:

H4a: CIO-CEO reporting structure leads to higher levels of IT-business alignment.

In contrast, companies where the CIO reports to other C-level executives (especially CFO) tend to leverage IT as a way to cut operating expenses (Caldwell et al., 1998). Studies call for a CIO–CFO reporting structure to keep a tab on IT spending. This reporting structure is associated with cost leaders, who view the IT unit as a cost center that must be scrutinized by the CFO and where the CIO's role is to support the firms overall cost leadership strategy with the aid of IT initiatives while simultaneously reducing IT costs (Banker et al., 2011; Krotov, 2015). Companies with this reporting structure have less formal structures (other than cost cutting and containment), less focus on skills development, less concern for broad value analytics and poorer partnerships and communications. Hence, we propose:

H4b: CIO-CFO reporting structure leads to lower levels of IT-business alignment.

4. METHODOLOGY

To test the hypotheses, this research performed an extensive psychometric survey among executives. The data collection and statistical analysis applied in this research follows.

4.1. Data Collection

The data used in this study obtained from 1,051 IT and non-IT executives and consultants from 395 "*Global Fortune 1,000"* organizations represent 16 different industries. The data collected covered a 13-year period. Of the 1,051 individual executive responses, 55% came from IT (CIOs and Chief Technology Officers), and 45% responses came from business (CEOs, CFOs, COOs, and other business unit executives). The data was collected largely (80%) via interviews and group discussion. Participants were asked to rate their organization's behavior in each of the model's 41 items. The reason for using the survey as an interview guide was/is to

ensure the accuracy and completeness of the responses, especially from executives who might not always understand the intent of the questions. It also provided the ability to dig deeper into the executives' perspective of the opportunities to improve alignment. These interviews were effective at collecting the survey data while also serving as a vehicle to facilitate the discussion necessary to elicit the executives more candid and complete position on these important factors, rather than being constrained to express their ideas in terms of a 5-point Likert-scale. Albeit, all responses were converted using a Likert-scale to identify the strength of alignment within each company.

A questionnaire (see Appendix), similar to the questionnaire used as an interview guide, was used to collect the remaining 20% of the research data. This approach provided a response rate of greater than 90%. As with the interviews, the survey data used a 5-point Likert scale. The reasons for using the 5-point Likert scale are as follows:

- this is the most common universal method for data collection and easily understood by participants;
- it allows participants to respond in a degree of agreement or disagreement, rather than take an actual stand on a certain issue
- the results are easily quantifiable and thus, easy to analyze.

Nevertheless, this scale often constrains participants to the given options and thus, may not identify what could be described as the true attitude of the respondents; hence, the value of the interview. In addition, participants may be influenced by their answers to previous questions, or concentrate their responses on one response column.

Last, undesirable social responses are occasionally compromise. For example, even when data are anonymized, participants tend to avoid choosing the "extreme" options on the scale (1 or 5) because of the negative connotation of being an "extremist", even if that choice would be the most accurate one.

Table 3 provides a breakdown of the respondents by industry and Table 4 provides a breakdown by region.

Table 3. The Distribution of Respondents by Industry Sector (n=1,051)

Industry Classification	Percentage
Agriculture	2.9%
Chemical	3.1%
Education	3.9%
Finance	24.5%
Government	4.2%
Healthcare	3.4%
Hotel/Entertainment	3.1%
Insurance	10.2%

Manufacturing	12.6%
Oil/Gas/Mining	0.2%
Pharmaceuticals	1.9%
Retail	4.3%
Services	2.9%
Telecommunication	14.7%
Transportation	4.2%
Utility	3.9%

Table 4. The Distribution of Respondents by Region (n=1,051)

Region Classification	**Percentage**
Asia	10.8%
Australia	6.9%
Europe	17.0%
Latin America	8.2%
Middle East / Africa	2.0%
North America	55.0%

4.2. Statistical Analysis

To articulate a valid measurement model, the research conducted a multi-collinearity analysis between items to demonstrate the distinct role of each of the six dimensions. The research applied two procedures to assess multicollinearity: (1) Correlation Analysis; and (2) Variance Inflation Factor (VIF). High correlations between variables (usually, .85 and higher) hint at substantial collinearity (Hair et al. 2006). Table 5 illustrates the correlations for the six dimensions, derived from following a Principal Component Analysis (PCA). The variables exhibit relatively high correlations' ranging from .68 to .76, but no correlation goes over the .85 threshold. The research further analyzed the 41 items that make up the six dimensions. The 41 items present a correlation ranging from 0.01 to 0.69; again, no correlation exceeds the .85 threshold.

Table 5. Correlations between the Six Dimensions

	Comm.	**Value Analytics**	**IT Gov.**	**Partnering**	**IT Scope**	**Skills Development**
Communication	-	0.72	0.72	0.75	0.68	0.73
Value Analytics	0.72	-	0.74	0.70	0.74	0.76

IT Governance	0.72	0.74	-	0.79	0.72	0.76
Partnering	0.75	0.70	0.79	-	0.73	0.73
IT Scope	0.68	0.74	0.72	0.73	-	0.72
IT Skills Dev.	0.73	0.76	0.76	0.73	0.72	-

Following Hair et al. (2006), each independent variable was regressed against the remaining independent variables. The research then used R^2 to calculate Tolerance (i.e., $1-R^2$) and the VIF (1/Tolerance). Each dimension and each of the 41 items individually were also assessed using multi-collinearity (see Table 6 for the statistics on the dimensions). Literature suggests different thresholds for VIF: Diamantopoulos and Winklhofer (2001) present a VIF cutoff of 10 that corresponds to a multicollinearity of .9; Kline (2005) suggests that multi-collinearity should be below .85, which gives a VIF of 6.7. No factor presented a VIF above the 6.7 threshold. We therefore conclude that although some factors exhibit relatively high correlations, the data does not present significant threats to multi-collinearity.

Table 6. SAM Dimensions Tolerance and VIF

Dimension	**Tolerance**	**VIF**
Communication	0.34	2.98
Value Analytics	0.30	3.33
IT Governance	0.28	3.63
Partnering	0.28	3.61
IT scope	0.34	2.95
Skills Development	0.30	3.38

Table 7 summarizes the aggregated means, standard deviations, skewness and kurtosis of the six SAM dimensions. The table shows that the means do not significantly differ: IT Scope had the highest mean score (3.16), following by IT Governance (3.13), Partnering (3.11), Communication (3.02), and Value Analytics (2.97). IT Skills Development had the lowest mean (2.91). Skewness and kurtosis were not high and did not raise any concerns.

Table 7. SAM Means and Standard Deviations

	Mean	**Standard Deviation**	**Skewness**	**Kurtosis**
Communication	3.02	0.62	-0.09	1.99
Value Analytics	2.97	0.75	-0.13	0.88

IT Governance	3.13	0.72	-0.22	1.15
Partnering	3.11	0.76	-0.15	1.02
IT scope	3.16	0.73	-0.26	1.00
IT Skills Development	2.91	0.74	-0.30	0.92

5. RESULTS

This section tests the hypotheses and analyzes the impact of industry sector, geographic region, organizational structure, and reporting structure on IT-Business alignment. To confirm each hypothesis, we tested the differences between the two sample means for the two independent samples of the relevant variable against SAM scores. We note that the comparison of two means is a useful statistical validation tool commonly applied in research for populations samples; it includes a calculation of a confidence interval and a statistical significance test (Fraenkel et al. 1993). We report the results of each hypothesis' analysis separately.

Table 8 presents the average SAM scores per industry. Financial organizations scored the highest SAM scores (3.07 on average), while Agriculture organization achieved the lowest scores (2.99 on average). Nevertheless, our statistical tests could not show any industry achieving significantly better (or worst) SAM scores, thus, **supporting Hypothesis H1**.

Table 8. The Distribution of SAM Scores by Industry

Industry Classification	**Average SAM Score**
Agriculture	2.99
Chemical	3.03
Education	3.03
Finance	3.07
Government	3.04
Healthcare	3.01
Hotel/Entertainment	3.03
Insurance	3.05
Manufacturing	3.05
Oil/Gas/Mining	3.01
Pharmaceuticals	3.06
Retail	3.02
Services	3.05
Telecommunication	3.06

Transportation	3.03
Utility	3.00

When considering the various geographic regions, the results, presented in Table 9, show that Asian organizations scored the highest SAM scores (3.32 on average) while African organizations achieved the lowest SAM scores (2.95 on average). When testing the scores of Asian organizations versus non-Asian organizations, the Asian organizations scored significantly higher (p-value = 0.0026). This result **supports Hypothesis H2**. A further analysis reveals that Indian services companies got the highest SAM scores, on average. This result corresponds with the high levels of maturity those companies attain through their CMMI appraisals (CMMI Institute, 2017).

Table 9. The Distribution of SAM Scores by Region

Region	**Average SAM Score**
Asia	3.32
Latin America	3.09
North America	3.02
Europe	3.00
Australia	2.99
Africa	2.95

Table 10 presents the average alignment scores of companies with different IT organizational structure. The table demonstrates that hybrid (or federated) organizations got the highest alignment scores (3.67 on average), followed by centralized organizations (3.59 on average). Decentralized organization received the lowest SAM scores (2.69 on average). When comparing the scores of centralized versus decentralized organizations, the centralized organizations scored significantly higher (p-value = 0.0304). This result **supports Hypothesis H3a**. When testing the scores of hybrid/federated organizations versus the other two types, the hybrid/federated organizations scored significantly higher (p-value = 0.0323). This finding **supports Hypothesis H3b**.

Table 10. The Distribution of SAM Scores by Organizational Structure

Organizational	**Average SAM**

Structure	Score
Hybrid	3.18
Centralized	3.02
Decentralized	2.83

Table 11 presents the average alignment scores of companies with different reporting structure. CIOs reporting to CEOs scored the highest alignment scores (3.15 on average), followed by CIOs reporting to COOs (3.08 on average). Next were CIOs reporting to other executives, which on average scored 2.96. CIOs reporting to CFOs had the lowest alignment scores (2.90 on average). When testing the scores of CIO-CEO reporting versus the other reporting structures, CIO-CEO reporting scored significantly higher (p-value = 0.0282). This result **supports Hypothesis H4a**. When testing the scores of CIO-CFO reporting versus the other reporting structures, CIO-CFO reporting scored significantly lower (p-value = 0.0125), thus **supporting Hypothesis H4b**.

Table 11. The Distribution of SAM Scores by Reporting Entity

Reporting Entity	Average SAM Score
CEO	3.15
COO	3.08
Other Executive	2.96
CFO	2.90

6. DISCUSSION AND CONCLUSIONS

Achieving and sustaining IT-business alignment continues to be a major concern to organizations around the globe and across every industry. Alignment is a dynamic and complex process that takes time to develop, achieve, and sustain. With most organizations in the research dataset, obtaining SAM scores of level 3 or less, it is apparent that achieving alignment is difficult and that there are still significant opportunities for organizations to improve IT-business alignment. Research shows that companies that were able to obtain alignment have the capability to create a strategic competitive advantage that provides them with increased distinguishability, efficiency, and profitability to adapt to today's fast-changing markets. Previous studies attempted to address the alignment conundrum; yet, those studies lack an overall view on factors that affect or help achieve a high level of alignment.

The model used in this paper looks at the scope and level of strategic alignment activities in which the IT function and other business functions mutually engage and which enable to coordinate IT related activities to increase alignment and business value. The model investigates

dynamic capabilities that support IT-business alignment and identifies related activities, which are likely to improve the state of the alignment. The focus is on activities carried out by IT, business, or both functions, primarily by observing the scope and extent of activities that drive and enable strategic alignment between business and IT. Alignment focuses also on a *collection* of activities that IT managers and business managers carry out jointly to coordinate goals and operations across IT and other organizational functions (e.g., finance, marketing, HR). Here, we show how certain traits that organizations can develop and cultivate namely organizational structure and reporting structure, can improve alignment. By adopting these traits, organizations can increase their ability to achieve alignment and derive business value from investing in IT.

This study explored several hypotheses tying organizational variables to alignments. Examining the impact of industry sector on IT-business alignment, the results of this study indicate that IT-business alignment is a pervasive and persistent problem with no particular industry presenting statistically better or worst IT-business alignment. The implication is clear: no industry is immune to this problem and every industry has an opportunity to improve IT-business alignment. In addition, the study confirms that hybrid IT organizational structures present high levels of IT-business alignment, as well as CIO-CEO reporting structure. This result indicates that hybrid IT structures seek to benefit from both the decentralized elements (communications, analytics and partnerships) and the centralized components (governance, IT scope and IT skills development). The hybrid combination essentially takes the best of both worlds and thus, promotes IT-business alignment. Moreover, a reporting structure where a CIO reports directly to the CEO indicates that the company is likely to have a more formal IT strategy, governance and structure. That results in better communications, partnerships, IT scope, value analytics and IT skills development, and thus, fosters IT-business alignment.

Overall, the study carries significant implications that open a new horizon for both academicians and practitioners to leverage IT. Academicians should recognize that IT-business alignment is an ongoing process and no single strategy or single combination of activities will ensure a company to achieve and sustain alignment. Technology and markets are changing far too rapidly today to ensure a single "winning strategy". Furthermore, contrary to past research on IT alignment, this study provides a comprehensive vehicle for academicians to benchmark where organization stand in terms of their alignment and perhaps more importantly, insights on what organizational traits can promote this alignment. Measuring and assessing a company's alignment level is an important step in identifying specific activities necessary for enhancing the corresponding relationship between business and IT, and in ensuring that IT is generating a demonstrable value to the business. It is also noteworthy that studies investigating the SAM model along with its six alignment components have shown consistent results over the past 15 years in terms of alignment. This study reinforces this observation and adds another layer by showing that certain organizational traits may produce better alignment outcomes.

Furthermore, although extensively studied, academicians and practitioners have yet to prescribe the ideal organizational structure or the CIO reporting structure that improves alignment. Despite significant changes in IT in the past two decades, the study shows that the "preferred" organizational structure and CIO reporting structure has remained consistent in our 13-year period data set. The results also suggest that the prescribed organizational structure and CIO reporting structure should not be industry-specific but generalized across industries. This is because organizations in an industry can take different strategies and still achieve IT-business alignment. Therefore, it is not necessary to examine each industry separately to specify or

prescribe the "preferred" organizational structure or the CIO reporting structure that enhances alignment. Correctly structuring the IT function and the CIO position to align with the firm's strategic positioning can have implications for firm performance. The optimal CIO reporting structure should not only reflect the strategic role of IT in the organization (or the CIO's), but also serves as a vehicle to create business value by matching the CIO with the executive supporting the organization's strategic positioning by leading valuable IT initiatives.

The implication to practitioners is clear: executives should work on improving the relationships between the business and IT. This includes working toward cooperation, participating in strategy development for both the business and IT, maintaining executive support and prioritizing projects more effectively. This collaboration between business and IT can facilitate a more competitive, successful and profitable organization. Furthermore, practitioners can use the results of this work to forge more comprehensive action plans for attaining better IT-business alignment, thus increasing the effect of IT on the business. The result is better company performance.

There are a few ways to extend this investigation: First, additional variables could help predict better alignment, for example, the CIO's traits (background, education, past positions, skills, and others). Future research could examine such other variables that help predict IT-business alignment and test the relationship between those variables and the variables studied in this work. Second, since this research was able to support the hypotheses, it would also be reasonable to conclude that additional responses and performance variables would increase the model accuracy or refine its design. Future research should consider collecting additional performance data (e.g., earnings, revenues, return over IT investment, net profit margin, or industry specific analytics) and measure the relationship between alignment and company performance, taking into consideration the factors examined in this study (industry, region, organizational structure and reporting structure). As more data is collected, additional investigations that detect causal effects among the measures would become particularly valuable. This would allow scholars and practitioners to gain insights on the various interactions of different IT-business alignment measures. For example, a consultant would be able to assist a company in deciding where and how to intervene to improve strategic alignment. This prospective line of research would enhance the application of the SAM model described in this study as a prescriptive tool to leverage IT services.

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APPENDIX: QUESTIONNAIRE INSTRUMENT

The following is the questionnaire used (primarily as an interview guide) to assess SAM's six dimensions. Parts II through VII of this questionnaire assess the firm's current level of strategic alignment maturity by measuring responses to items related to IT and business organizations, as follows:

Communications	(Part II)
Competency and value of IT	(Part III)
IT governance decisions	(Part IV)
Partnerships	(Part V)
IT infrastructure	(Part VI)
Skills resources	(Part VII)

For each of the questions in these sections, the respondents chose the one response that most closely represented their opinion of the effectiveness of their organization's management practices and strategic choices. If they were unsure how to answer a question without guessing, or if the item was not applicable to their organization, they were asked to mark the "N/A or don't know" box.

PART II: EFFECTIVENESS OF IT AND BUSINESS COMMUNICATIONS

1. To what extent does IT understand the organization's business environment (e.g., its customers, competitors, processes, partners/alliances):

   1 ☐ Senior and mid-level IT managers do not understand the business.

   2 ☐ Senior and mid-level IT managers have a limited understanding of the business.

   3 ☐ Senior and mid-level IT managers have a good understanding of the business.

   4 ☐ Understanding of the business by all IT members is encouraged and promoted by senior managers.

   5 ☐ Understanding of the business is required (e.g., tied to performance appraisals) throughout the IT function.

   6 ☐ N/A or don't know

2. To what extent do the business organizations understand the IT environment (e.g., its current and potential capabilities, systems, services, processes):

   1 ☐ Senior and mid-level business managers do not understand IT.

   2 ☐ Senior and mid-level business managers have a limited understanding of IT.

   3 ☐ Senior and mid-level business managers have a good understanding of IT.

   4 ☐ Understanding of IT by all employees is encouraged and promoted by senior management.

   5 ☐ Understanding of IT is required (e.g., tied to performance appraisals) throughout the business.

   6 ☐ N/A or don't know

3. The following statements pertain to methods (e.g., intranets, bulletin boards, education, meetings, e-mail) in place to promote organizational education/learning (e.g., of experiences, problems, objectives, critical success factors). Organizational learning occurs primarily through:

   1 ☐ Ad-hoc/casual methods (employee observation, anecdote sharing, peer meetings, etc.)

   2 ☐ Informal methods (newsletters, bulletin board notices, computer reports, group e-mail, fax, etc.)

   3 ☐ Regular, clear methods (training, e-mail, phone-mail, intranet, department meetings, etc.) from mid-level management

   4 ☐ Formal, unifying, bonding methods from senior *and* mid-level management

   5 ☐ Formal, unifying, bonding methods from senior and mid-level management, *with feedback* measures to monitor and promote effectiveness of learning

6 ☐ N/A or don't know

4. The following question pertains to communications protocol. The IT and business communication style (e.g., ease of access, familiarity of stakeholders) tends to be:

1 ☐ One-way, from the business; formal and inflexible

2 ☐ One-way, from the business; moderately informal and moderately flexible

3 ☐ Two-way; formal and inflexible

4 ☐ Two-way; moderately informal and moderately flexible

5 ☐ Two-way; informal and flexible

6 ☐ N/A or don't know

5. The following statements pertain to the extent in which there is knowledge sharing (intellectual understanding and appreciation of the problems/opportunities, tasks, roles, objectives, priorities, goals, direction, etc.) between IT and business:

1 ☐ Knowledge sharing is on an ad-hoc basis.

2 ☐ Knowledge sharing is somewhat structured and/or structure is beginning to be created.

3 ☐ There is structured sharing around key functional unit processes.

4 ☐ There is formal sharing at the functional unit level ***and*** at the corporate level.

5 ☐ There is formal sharing at the functional unit level, at the corporate level, ***and*** with business partners/alliances.

6 ☐ N/A or don't know

6. The following statements pertain to the role and effectiveness of IT and business liaisons:

1 ☐ We do not use liaisons, or if we do, we do so on an ad-hoc, as needed basis.

2 ☐ We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. They are the primary contact point for interactions between IT and the business. Liaisons *are not* usually used to facilitate relationship development.

3 ☐ We regularly use liaisons to transfer IT knowledge to the business and business knowledge to IT. *T*hey occasionally facilitate relationship development.

4 ☐ We regularly use liaisons to facilitate the transfer of IT knowledge to the business and business knowledge to IT. Their primary objective is to facilitate internal relationship development.

5 ☐ We regularly use liaisons to facilitate the transfer of IT knowledge to the business and external partners and business knowledge to IT. Their primary objective is to facilitate relationship development across the business and its external partners.

6 ☐ N/A or don't know

PART III: MEASUREMENT OF THE COMPETENCY AND VALUE OF IT

7. The following statements pertain to the metrics and processes used to measure IT's contribution to the business.

1 ☐ The metrics and processes we have in place to measure IT are primarily technical (e.g., system availability, response time).

2 ☐ We are equally concerned with technical *and* cost efficiency measures. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.

3 ☐ We formally assess technical and cost efficiency using traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC). We are starting to put formal feedback processes in place to review and take action based on the results of our measures.

4 ☐ We formally assess technical, cost efficiency, and cost effectiveness using traditional financial measures (e.g., ROI, ABC). We have formal feedback processes in place to review and take action based on the results of our measures.

5 ☐ We use a multi-dimensional approach with appropriate weights given to technical, financial, operational, and human-related measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

6 ☐ N/A or don't know

8. The following statements pertain to the use of business metrics to measure contribution to the business.

1 ☐ We do not measure the value of our business investments, or do so on an ad-hoc basis.

2 ☐ We are concerned with cost efficiency measures at the functional organization level only. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.

3 ☐ We formally use traditional financial measures, such as return on investment (ROI) and activity-based costing (ABC), across functional organizations. We are starting to have formal feedback processes in place to review and take action based on the results of our measures.

4 ☐ We formally measure value based on the contribution to our customers. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organizations.

5 ☐ We use a multi-dimensional approach with appropriate weights given to technical, financial, operational, and human-related measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

6 ☐ N/A or don't know

9. The following statements pertain to the use of integrated IT and business metrics to measure IT's contribution to the business.

1 ☐ We do not measure the value of our IT business investments, or do so on an ad-hoc basis.

2 ☐ The value measurements for IT and business are not linked. We have limited or no formal feedback processes in place to review and take action based on the results of our measures.

3 ☐ The value measurements for IT and business are starting to be linked and formalized. We are also starting to have formal feedback processes in place to review and take action based on the results of our measures.

4 ☐ We formally link the value measurements of IT and business. We have formal feedback processes in place to review and take action based on the results of our measures and to assess contributions across functional organizations.

5 ☐ We use a multi-dimensional approach with appropriate weight given to IT and business measures. We have formal feedback processes in place to review and take action based on the results of our measures. These measures are extended to our external partners (e.g., vendors, outsourcers, customers).

6 ☐ N/A or don't know

10. The following statements pertain to the use of service level agreements (SLAs):

1 ☐ We do not use SLAs or do so sporadically.

2 ☐ We have SLAs which are primarily technically oriented (response time, length of computer downtime, etc.), between the IT and functional organizations.

3 ☐ We have SLAs which are both technically oriented and relationship-oriented (user/customer satisfaction, IT's commitment to the business, etc.) that are between the IT and functional organizations and also emerging across the enterprise.

4 ☐ We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional organizations as well as enterprise wide.

5 ☐ We have SLAs which are both technically-oriented and relationship-oriented, between the IT and functional organizations as well as at enterprise wide and with our external partners/alliances.

6 ☐ N/A or don't know

11. The following statements pertain to benchmarking practices. *Informal* practices are such things as informal interviews, literature searches, company visits, etc., while *formal* practices are such things as environmental scanning, data gathering and analysis, determining best practices, etc.

1 ☐ We seldom or never perform either informal or formal benchmarks.

2 ☐ We occasionally or routinely perform informal benchmarks.

3 ☐ We occasionally perform formal benchmarks and seldom take action based on the findings.

4 ☐ We routinely perform formal benchmarks and usually take action based on the findings.

5 ☐ We routinely perform formal benchmarks and have a regulated process in place to take action and measure the changes.

6 ☐ N/A or don't know

12. The following statements pertain to the extent of assessment and review of IT investments.

1 ☐ We do not formally assess and/or review.

2 ☐ We assess and/or review only after we have a business or IT problem (i.e., failed IT project, market share loss).

3 ☐ Assessments and/or reviews are becoming routine occurrences.

4 ☐ We routinely assess and/or review and have a formal process in place to make changes based on the results.

5 ☐ We routinely assess and/or review and have a formal process in place to make changes based on the results and measure the changes. Our external partners are included in the process.

6 ☐ N/A or don't know

13. The following statements pertain to the extent to which IT-business continuous improvement practices (e.g., quality circles, quality reviews) and effectiveness measures are in place.

1 ☐ We do not have any continuous improvement practices in place.

2 ☐ We have a few continuous improvement practices in place, but no effectiveness measures are in place.

3 ☐ We have a few continuous improvement practices in place and the use of effectiveness measures is emerging.

4 ☐ We have many continuous improvement practices in place and we frequently measure their effectiveness.

5 ☐ We have well established continuous improvement practices and effectiveness measures in place.

6 ☐ N/A or don't know

14. The demonstrated contribution that the IT function has made to the accomplishment of the organization's strategic goals is:

1 ☐ Very weak

2 ☐ Somewhat weak

3 ☐ Neither weak nor strong

4 ☐ Somewhat strong

5 ☐ Very strong

6 ☐ N/A or don't know

PART IV: IT GOVERNANCE

15. The following statements pertain to strategic business planning with IT participation.

1 ☐ We do no formal strategic business planning or, if it is done, it is done on an as-needed basis.

2 ☐ We do formal strategic business planning at the functional unit level with slight IT participation.

3 ☐ We do formal strategic business planning at the functional unit levels with some IT participation. There is some inter-organizational planning.

4 ☐ We do formal strategic business planning at the functional unit and across the enterprise with IT participation.

5 ☐ We do formal strategic business planning at the functional unit, across the enterprise, and with our business partners/alliances with IT participation.

6 ☐ N/A or don't know

16. The following statements pertain to strategic IT planning with business participation.

1 ☐ We do no formal strategic IT planning or, if it is done, it is done on an as-needed basis.

2 ☐ We do formal strategic IT planning at the functional unit level with slight business participation.

3 ☐ We do formal strategic IT planning at the functional unit levels with some business participation. There is some inter-organizational planning.

4 ☐ We do formal strategic IT planning at the functional unit and across the enterprise with the business.

5 ☐ We do formal strategic business planning at the functional unit, across the enterprise, and with our business partners/alliances.

6 ☐ N/A or don't know

17. The following statements pertain to IT budgeting. Our IT function is budgeted as a:

1 ☐ Cost center, with erratic/inconsistent/irregular/changeable spending

2 ☐ Cost center, by functional organization

3 ☐ Cost center with some projects treated as investments

4 ☐ Investment center

5 ☐ Profit center, where IT generates revenues

6 ☐ N/A or don't know

18. The following statements pertain to IT investment decisions. Our IT investment decisions are primarily based on IT's ability to:

1 ☐ Reduce costs.

2 ☐ Increase productivity and efficiency as the focus.

3 ☐ Traditional financial reviews. IT is seen as a process enabler.

4 ☐ Business effectiveness is the focus. IT is seen as a process driver or business strategy enabler.

5 ☐ Create competitive advantage and increase profit. Our business partners see value.

6 ☐ N/A or don't know

19. The following statements pertain to IT steering committee(s) with senior level IT and business management participation.

1 ☐ We do not have formal/regular steering committee(s).

2 ☐ We have committee(s) which meet informally on an as-needed basis.

3 ☐ We have formal committees, which meet regularly and have emerging effectiveness.

4 ☐ We have formal, regular committee meetings with demonstrated effectiveness.

5 ☐ We have formal, regular committee meetings with demonstrated effectiveness that include strategic business partners sharing decision-making responsibilities.

6 ☐ N/A or don't know

20. The following statements pertain to the prioritization of IT projects. Our IT project prioritization process is usually:

1 ☐ In reaction to a business or IT need.

2 ☐ Determined by the IT function.

3 ☐ Determined by the business function.

4 ☐ Mutually determined between senior and mid-level IT and business management.

5 ☐ Mutually determined between senior and mid-level IT and business management and with consideration of the priorities of any business partners/alliances.

6 ☐ N/A or don't know

21. The ability of the IT function to react/respond quickly to the organization's changing business needs is:

1 ☐ Very weak

2 ☐ Somewhat weak

3 ☐ Neither weak nor strong

4 ☐ Somewhat strong

5 ☐ Very strong

6 ☐ N/A or don't know

PART V: PARTNERSHIPS BETWEEN IT AND BUSINESS FUNCTIONS

22. IT is perceived by the business as:

1 ☐ A cost of doing business

2 ☐ Emerging as an asset

3 ☐ A fundamental enabler of future business activity

4 ☐ A fundamental driver of future business activity

5 ☐ A partner with the business that co-adapts/improvises in bringing value to the firm

6 ☐ N/A or don't know

23. The following statements pertain to the role of IT in strategic business planning.

1 ☐ IT does not have a role.

2 ☐ IT is used to enable business processes.

3 ☐ IT is used to drive business processes.

4 ☐ IT is used to enable or drive business strategy.

5 ☐ IT co-adapts with the business to enab/e/drive strategic objectives.

6 ☐ N/A or don't know

24. The following statements pertain to the sharing (by IT and business management) of the risks and rewards (e.g., bonuses) associated with IT-based initiatives (i.e., a project is late and over budget because of business requirement changes).

1 ☐ IT takes all the risks and does not receive any of the rewards.

2 ☐ IT takes most of the risks with little reward.

3 ☐ Sharing of risks and rewards is emerging.

4 ☐ Risks and rewards are always shared.

5 ☐ Risks and rewards are always shared and we have formal compensation and reward systems in place that induce managers to take risks.

6 ☐ N/A or don't know

25. The following statements pertain to formally managing the IT/business relationship. To what extent are there formal processes in place that focus on enhancing the partnership relationships that exist between IT and business (e.g., cross-functional teams, training, risk/reward sharing):

1 ☐ We don't manage our relationships.

2 ☐ We manage our relationships on an ad-hoc basis.

3 ☐ We have defined programs to manage our relationships, but IT or the business does not always comply with them. Conflict is seen as creative rather than disruptive.

4 ☐ We have defined programs to manage our relationships and both IT and the business comply with them.

5 ☐ We have defined programs to manage our relationships, both IT and the business comply with them, and we are continuously improving them.

6 ☐ N/A or don't know

26. The following statements pertain to IT and business relationship and trust.

1 ☐ There is a sense of conflict and mistrust between IT and the business.

2 ☐ The association is primarily an "arm's length" transactional style of relationship.

3 ☐ IT is emerging as a valued service provider.

4 ☐ The association is primarily a long-term partnership style of relationship.

5 ☐ The association is a long-term partnership and valued service provider.

6 ☐ N/A or don't know

27. The following statements pertain to business sponsors/champions. Our IT-based initiatives:

1 ☐ Do not usually have a senior level IT or business sponsor/champion.

2 ☐ Often have a senior level IT sponsor/champion only.

3 ☐ Often have a senior level IT and business sponsor/champion at the functional unit level.

4 ☐ Often have a senior level IT and business sponsor/champion at the corporate level.

5 ☐ Often have a senior level IT and the CEO as the business/sponsor champion.

6 ☐ N/A or don't know

PART VI: SCOPE AND ARCHITECTURE OF THE IT INFRASTRUCTURE

28. The following statements pertain to the scope of your IT systems. Our primary systems are:

1 ☐ Traditional office support (e.g., e-mail, accounting, word processing, legacy systems)

2 ☐ Transaction-oriented (e.g., back office support)

3 ☐ Business process enablers (IT supports business process change)

4 ☐ Business process drivers (IT is a catalyst for business process change)

5 ☐ Business strategy enablers/drivers (IT is a catalyst for changes in the business strategy)

6 ☐ N/A or don't know

29. The following statements pertain to the articulation of and compliance with IT standards. Our IT standards are:

1 ☐ Non-existent *or* not enforced

2 ☐ Defined and enforced at the functional unit level but not across different functional units

3 ☐ Defined and enforced at the functional unit level with emerging coordination across functional units

4 ☐ Defined and enforced across functional units

5 ☐ Defined and enforced across functional units, and with joint coordination among our strategic business partners/alliances

6 ☐ N/A or don't know

30. The following statements pertain to the scope of architectural integration. The components of our IT infrastructure are:

1 ☐ Not well integrated

2 ☐ Integrated at the functional unit with emerging integration across functional units

3 ☐ Integrated across functional units

4 ☐ Integrated across functional units and our strategic business partners/alliances

5 ☐ Evolving with our business partners

6 ☐ N/A or don't know

31. The following statements pertain to the level of disruption caused by business and IT changes (e.g., implementation of a new technology, business process, merger/acquisition). Most of the time, a business or IT change is:

1 ☐ Not readily transparent (very disruptive)

2 ☐ Transparent at the functional level only

3 ☐ Transparent at the functional level and emerging across all remote, branch, and mobile locations

4 ☐ Transparent across the entire organization

5 ☐ Transparent across the organization and to our business partners/alliances

6 ☐ N/A or don't know

32. The following statements pertain to the scope of IT infrastructure flexibility to business and technology changes. Our IT infrastructure is viewed as:

1 ☐ A utility providing the basic IT services at minimum cost

2 ☐ Emerging as driven by the requirements of the current business strategy

3 ☐ Driven by the requirements of the current business strategy

4 ☐ Emerging as a resource to enable fast response to changes in the marketplace

5 ☐ A resource to enable and drive fast response to changes in the marketplace

6 ☐ N/A or don't know

PART VII: HUMAN RESOURCE SKILLS

33. The following statements pertain to the extent the organization fosters an innovative entrepreneurial environment. Entrepreneurship is:

1 ☐ Discouraged

2 ☐ Moderately encouraged at the functional unit level

3 ☐ Strongly encouraged at the functional unit level

4 ☐ Strongly encouraged at the functional unit and corporate levels

5 ☐ Strongly encouraged at the functional unit, corporate level, and with business partners/alliances

6 ☐ N/A or don't know

34. The following statements pertain to the cultural locus of power in making IT-based decisions. Our important IT decisions are made by:

1 ☐ Top business management or IT management at the corporate level only

2 ☐ Top business or IT management at corporate level with emerging functional unit level influence

3 ☐ Top business management at corporate and functional unit levels, with emerging shared influence from IT management

4 ☐ Top management (business and IT) across the organization and emerging influence from our business partners/alliances.

5 ☐ Top management across the organization with equal influence from our business partners/alliances.

6 ☐ N/A or don't know

35. The following statements pertain to your organization's readiness for change.

1 ☐ We tend to resist change.

2 ☐ We recognize the need for change and change readiness programs are emerging.

3 ☐ Change readiness programs providing training and necessary skills to implement change are in place at the functional unit level.

4 ☐ Change readiness programs are in place at the corporate level.

5 ☐ Change readiness programs are in place at the corporate level and we are proactive and anticipate change.

6 ☐ N/A or don't know

36. The following statements pertain to career crossover opportunities among IT and business personnel.

1 ☐ Job transfers rarely or never occur.

2 ☐ Job transfers occasionally occur within the functional organization.

3 ☐ Job transfers regularly occur for management level positions usually at the functional level.

4 ☐ Job transfers regularly occur for all position levels and within the functional units.

5 ☐ Job transfers regularly occur for all position levels, within the functional units, and at the corporate level.

6 ☐ N/A or don't know

37. The following statements pertain to employee opportunities to learn about and support services outside the employee's functional unit (e.g., programmers trained in product/service production functions, customer service trained in systems analysis) using programs such as cross training and job rotation. The organization:

1 ☐ Does not provide opportunities to learn about support services outside the employee's functional unit.

2 ☐ Opportunities are dependent on the functional unit.

3 ☐ Formal programs are practiced by all functional units.

4 ☐ Formal programs are practiced by all functional units and across the enterprise.

5 ☐ Opportunities are formally available across the enterprise and with business partners/alliances.

6 ☐ N/A or don't know

38. The following statements pertain to the interpersonal interaction (e.g., trust, confidence, cultural, social, and political environment) that exists across IT and business units in our organization.

1 ☐ There is minimum interaction between IT and business units.

2 ☐ The association is primarily an "arm's length" transactional style of relationship.

3 ☐ Trust and confidence among IT and business is emerging.

4 ☐ Trust and confidence among IT and business is achieved.

5 ☐ Trust and confidence is extended to external customers and partners.

6 ☐ N/A or don't know

39. The following statements pertain to the IT organization's ability to attract and retain the best business and technical professionals.

1 ☐ There is no formal program to retain IT professionals. Recruiting demands are filled ineffectively.

2 ☐ IT hiring is focused on technical expertise.

3 ☐ IT hiring is focused equally on technical and business expertise. Retention programs are in place.

4 ☐ Formal programs are in place to attract and retain the best IT professionals with both technical and business skills.

5 ☐ Effective programs are in place to attract and retain the best IT professionals with both technical and business skills.

6 ☐ N/A or don't know