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Alain Nkoyock
University of Phoenix and United Nations Office on Drugs and Crime, alain.nkoyock@yahoo.com

Barry Spiker
University of Phoenix, b.spiker@att.net

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ALIGNING IT TO BUSINESS IN COMPLEX MULTINATIONAL CORPORATIONS: THE CASE OF THE U.N. SECRETARIAT

Alain Nkoyock[1]
School of Advanced Studies
University of Phoenix (USA)
and
United Nations Office on Drugs and Crime
Austria
Telephone: +4369914547041
Email: ankoyock@email.phoenix.edu

Barry Kent Spiker
School of Advanced Studies
University of Phoenix (USA)
Email: b.spiker@att.net

Abstract

Business-IT strategic alignment grows in importance as organizations strive to link business and technology in light of the internationalization of their businesses. This positivistic research method uses a field survey design to examine (a) the role of knowledge management processes in the relationship between contextual factors and alignment in the U.N. Secretariat, and (b) the role of IT projects in the relationship between alignment and the performance and effectiveness of the U.N. Secretariat. Structural equation modeling techniques are conducted to analyze data collected through a sample of 166 IT managers and 97 business managers from 50 offices in the U.N. Secretariat. The measurement model exhibited a fairly good fit. The results of the study have at least four implications to leaders in the U.N. Secretariat and in multinational corporations (MNCs). A theoretical and practical perspective of business-IT strategic alignment in the U.N. Secretariat is provided. The study draws upon the strategic alignment model and the typology of MNCs to propose and test an IT strategic alignment model for MNCs (mSAM). The business-IT strategic alignment implementation model for MNCs (mSAIM) is the model for application proposed as the critical recommendation of the research study.

Keywords: Strategic alignment model (SAM), Strategic alignment model for MNCs (mSAM), Strategic alignment implementation model for MNCs (mSAIM), business-IT strategic alignment, multinational corporations, IT strategic planning, IT leadership, strategic IT management, structural equation modeling, United Nations Secretariat.

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[1] Corresponding author.

ALIGNING IT TO BUSINESS IN COMPLEX MULTINATIONAL CORPORATIONS: THE CASE OF THE U.N. SECRETARIAT

INTRODUCTION

Information technology (IT) attracts widespread attention from both corporate executives and scholars as a critical enabler of competitive advantage for organizations. Total worldwide investment in IT exceeded one trillion U.S. dollars per annum in 2001, and it grows about 10% per annum compounded (McAfee, 2004; Seddon, Graeser, and Willcocks, 2002). The alignment of worldwide IT strategies and integrated business objectives and goals is critical to the success of multinational organizations in a highly competitive global market (Boerner, 2007; Booth and Philip, 2005; Dalglish, 2006). The problem is that alignment becomes difficult to implement as companies strived to link business and technology in light of the internationalization of their businesses (Hill, 2006; King, 2010). McKinsey (2010) identified five global forces whose impact is rewriting the list of opportunities and challenges facing global business. They include (a) the rise of emerging markets as centers of consumerism and innovation; (b) the imperative to improve developed-market productivity; (c) ever-expanding global networks; (d) the tension between rapidly rising resource consumption and sustainability; and (e) the increasingly larger role of the state as a business regulator and partner.

Past research did not propose theoretical and empirical investigations of both content and process perspectives of alignment for multinational corporations (MNCs) (Martinsons, Everett, and Chan, 2001). Despite almost two decades of research, business-IT strategic alignment in a local context continues to garner attention (Kearns and Sabherwal, 2007). The present study addresses this limitation by drawing upon the strategic alignment model (SAM) of Henderson and Venkatraman (1993) and the typology of MNCs of Bartlett and Ghoshal (1989) to propose and test an IT strategic alignment model for MNCs (or mSAM) using the U.N. Secretariat as a field study.

The purpose of this paper is to investigate business-IT alignment in a multinational corporation by examining (a) the role of knowledge management processes in the relationship between contextual factors and alignment, and (b) the role of IT projects

in the relationship between alignment and organizational performance and effectiveness. The paper focuses on two aspects of strategic IT planning within the U.N. Secretariat: (a) business-IT strategic alignment and (b) IT project planning. The objective is to investigate business-IT alignment in the U.N. Secretariat by examining two relationships. The first relationship lies between contextual factors and alignment with knowledge considerations as a mediating variable. The second relationship lies between alignment and organizational performance and effectiveness with IT projects as a mediating variable.

This study has managerial implications for the consideration of business executives and information systems managers and provides insights to researchers on the issues of business-IT strategic alignment in complex multinational organizations. This paper contributes to the literature on IT leadership and strategic IT management by pursuing the two research questions:

1. Based on knowledge management (KM) processes, how do planning behaviors (participation of IT managers in business planning and participation of business executives in strategic IT planning) and the support of top-management of IT mediate the effects of three contextual factors (organizational emphasis on KM, management of the perceived environmental uncertainty, and integration of IT decisions) on business-IT strategic alignment in the U.N. Secretariat?

2. How do aspects of IT projects mediate the association between IT strategic alignment and the U.N. Secretariat performance and effectiveness?

LITERATURE SURVEY
Knowledge-based View of the MNC and Business-IT Strategic Alignment
The creation of a global village with possibilities of knowledge sharing is among the contributions of the IT revolution and globalization. In the knowledge society, the strategies to create business value and long-term viability depend on sustaining competitive advantage of the firm (Henard and McFadyen, 2008). The knowledge-based view of the firm draws upon the resource-based view (Fahy, 2000; Levitas and Ndofor, 2006; Penrose, 1959; Moustaghfir, 2008; Wernerfelt, 1984; Zhang, 2007) and considers knowledge as a distinctively unique resource to manage. Knowledge could be tacit or explicit (Regan and O'Connor, 2002) or embedded (Bourdeau and

Couillard, 1999). Knowledge management (KM) refers to the process of creating and managing a culture and structure that encourage and facilitate the creation, appropriate use, and sharing of knowledge to improve organizational performance and effectiveness (Walczak, 2005).

The knowledge creation process involves three elements (people, processes, and technology) and comprises nine classes of activities consisting of five primary and four secondary activities (Jones, 2006). They are (a) acquisition, (b) selection, (c) generation, (d) assimilation, and (e) emission of tacit, explicit, and embedded knowledge. Holsapple and Singh (2001) added four secondary classes of activities: (a) measurement, (b) control, (c) coordination, and (d) leadership. Various perspectives guided conceptualizations of knowledge management (KM) as well as intellectual and human capital in organizational design. These perspectives were information-processing, organizational learning, knowledge creation, dynamic capabilities, and resource-based theory of the firm. According to Levitas and Ndofor (2006), these approaches draw upon strategic management theories and cover both local and multinational environments.

Recent international business literature conceptualized multinational corporations (MNCs) as worldwide networks of knowledge acquisition, transfer, and integration across countries (Qin, Ramburuth, and Wang, 2008). The transfer of knowledge within an MNC network is still difficult due to various contextual variables (Kasper, Muhlbacher, and Muller, 2008). Many scholars (Qin et al., 2008; Riege, 2007) proposed models to clarify the issues of knowledge integration within MNCs. Qin et al. (2008) tested an environment-strategy-performance model in an MNC case study in China to examine the interaction between cultural distance and subsidiary roles in the knowledge transfer process. The results of their study showed that knowledge transfer in MNCs is influenced by external context (cultural distance) and internal mechanisms (subsidiary roles).

Luo (2000) and Subramaniam (1998) examined the successful patterns employed by organizations to develop new global products based on the three essential ingredients (distinctive resources, resource allocation, and dynamic learning) of the dynamic capability approach on international business. The results from Luo's research

suggested that dynamic capabilities in MNCs were the abilities to create, deploy, and upgrade corporate resources in a quest of enduring advantages in the global market. From another perspective, the results from Subramaniam's (1998) study revealed that subsidiary knowledge was a key asset for the development of global products because the variance in the development of new global capabilities among organizations depends on the knowledge leveraged across borders by their corporate routines.

Foss (2006) highlighted a dichotomy in the investigations of knowledge considerations in multinational corporation literature: (a) an overemphasis on knowledge flows, (b) an inadequate emphasis on knowledge stocks, and (c) a lack of understanding of the associations between knowledge flows and stocks. In an attempt to clarify the causal linkages between knowledge flows and stocks, Gupta and Govindarajan (2000) classified subsidiary roles of the knowledge flow pattern into four categories: (a) global innovator, (b) integrated player, (c) implementer, and (d) local innovator. Gupta and Govindarajan advised that the analysis of the patterns of knowledge flows within an MNC should focus on the direction and the magnitude of these flows. The four categories of Gupta and Govindarajan's classification coincided with Bartlett and Ghoshal's (1989) four forms of multinational corporations. This research study with the U.N. Secretariat as a transnational field study focuses on the integrated player category that relied on knowledge inflows from either the parent or peer subsidiaries (Gupta and Govindarajan, 2000).

Prior research examined the outcomes of business-IT strategic alignment (Kearns and Lederer, 2003) and direct or indirect business effects of IT on organizational productivity (Kearns and Sabherwal, 2007; Zhang, 2007) by using the resource-based view. Kearns and Lederer posited that knowledge integration facilitates the creation of corporate strategies and provided a model of the alignment-performance linkage. Kearns and Sabherwal also showed that knowledge integration processes and behaviors facilitate knowledge integration outcomes and the linkage between strategic IT plans and business objectives. This study draws upon the knowledge-based view to examine the effects of MNC emphasis on knowledge management on business-IT alignment. Planning behaviors and top management knowledge of IT served as mediating variables.

The creation of an organizational culture and structure that encourage and facilitate the creation, appropriate use, and sharing of knowledge (Jones, 2006; Walczak, 2005) enables and encourages organizational performance and effectiveness. The possibility of managing knowledge in an MNC reflects the commitment of top management to knowledge formation and dissemination within the Secretariat. Over time, MNC emphasis of KM facilitates top managers' knowledge of IT through more frequent interaction with IT managers.

The Strategic Alignment Model (SAM)

The germinal work on business-IT strategic alignment started with the stages of growth models of organizational research (Greiner, 1998) and information systems (IS) planning research (Burn, 1994). The systematic research and the understanding of a strategic alignment paradigm began with the strategic alignment model (SAM) of Henderson and Venkatraman (1992), which illustrated the interrelationship between business and IT.

Various scholars (Martin, Gregor, and Hart, 2005; Reich and Benbasat, 2000) extended Henderson and Venkatraman's initial SAM by identifying other factors that contribute to alignment. The SAM encompasses four quadrants (or domains), their interrelationships, and two distinct functions that determine business-IT relationships (Papp, 1999). According to Henderson and Venkatraman, the first function, strategic fit, refers to the vertical linkage that integrates corporate external environment and organizational internal environment. In contrast, functional integration is the corresponding horizontal linkage between business and IT.

From the strategic alignment model (SAM), some scholars (Henderson and Venkatraman, 1993; Luftman, Papp, and Brier, 1999) identified four dominant alignment perspectives: (a) strategy execution, (b) technology transformation, (c) service level, and (d) competitive potential. In the first two cross-domain relationships (strategy execution and technology transformation), the impetus is business strategy. In contrast, IT strategy is an enabler from the service level and competitive potential alignment perspectives.

Henderson and Venkatraman (1993) posited the strategy execution alignment perspective was elaborated upon business strategy and became the impetus behind the designs of corporate infrastructure and IT infrastructure. Papp (1999) noted that corporate managers frequently use this perspective because of its closeness to the classical view of strategic management. Various researchers proposed several analytical methodologies such as business systems planning, critical success factors, and enterprise modeling to make the strategy execution alignment operational.

The technology transformation perspective does not reflect the design of organizational infrastructure. This approach identifies the best possible IT resources by contemplating the corresponding IT architecture and the most appropriate positioning in the IT marketplace. The technology transformation perspective reflects on the accomplishment of the expected business goals through appropriate IT strategies, infrastructure, and processes.

Managers consider the competitive potential and service level perspectives when they explore the possibility of information systems (IS) being an enabler of new or enhanced business strategies with positive impacts (Henderson and Venkatraman, 1999). The service level perspective focuses on the design and deployment of an advanced IS for the organization. Henderson and Venkatraman argued that the service level perspective requires a sound understanding of the evolution of information and communication technologies, quality of IT projects planning, and the successful implementation of IT projects. With the competitive potential perspective, managers identify business strategies and take decisions on the required infrastructure and processes for the organization. Strategic management from the competitive potential perspective is a decision-making process that responds to customer short-term demands with long-term investment in infrastructure by establishing and sustaining a set of priorities.

Process Perspectives of Business-IT Strategic Alignment

The strategic alignment model (SAM) defines the range of choices that corporate managers have during a strategic alignment process. This process includes different elements (formality, scope, participation, influence, and coordination) and describes the approaches organizations follow in developing and implementing their business-IT strategic alignment. Other scholars extended Henderson and Venkatraman's

(1993) initial SAM by identifying factors that contribute to alignment. Campbell, Kay, and Avison (2005) categorized these factors into intellectual and social dimensions (Gregor et al., 2007; Martin et al., 2005), short-and long-term dimensions (Reich and Benbasat, 1996), shared domain knowledge (Sabherwal and Sabherwal, 2005), and enablers and inhibitors (Gregor et al., 2007; Luftman, Papp, and Brier, 1999).

This paper focuses on two processes tested in various empirical studies: (a) participation of IT managers in business planning and (b) participation of business executives in strategic IT planning. This study takes into consideration, implicitly or explicitly, the various dimensions (intellectual and social, short- and long-term, shared domain knowledge, enablers, and inhibitors) of IT strategic alignment process within the U.N. Secretariat. The knowledge sharing that may stem from intellectual and social collaborations between the two groups of managers could improve the U.N. Secretariat performance and effectiveness. Properly conceived, business-IT alignment processes represent a unique corporate resource that produces short- and long-term IT-based sustainable competitive advantage and superior performance.

Content (or Outcomes) Perspective of IT Strategic Alignment

The process (what is intended and pursued) of strategic alignment describes the approaches an organization follows in developing and implementing its business-IT strategic alignment. By contrast, the content (what is realized or outcomes) of a strategy specifies its basic components and orientations (Das, Zahra, and Warketin, 1991). The content perspective of business-IT strategic alignment emphasizes: (a) the strategic orientation of business enterprises (STROBE), (b) the strategic orientation of the existing portfolio of information systems (STROEPIS), and (c) the strategic alignment and their perceived outcomes.

Forms of MNCs and IT Strategies

The research of Bartlett and Ghoshal (1989) provided a framework for this study on business-IT strategic alignment for the U.N. Secretariat. Bartlett and Ghoshal's research on the global integration-local responsiveness model (Prahalad and Doz, 1987) was an influential framework dealing with international business strategy, management relationships, and control within MNCs. Bartlett and Ghoshal drew upon the global integration-local responsiveness model to propose four forms of MNCs: global corporations (GCs), international corporations (INCs), multidomestic corporations (MDCs), and transnational corporations (TNCs) (see Figure 1).
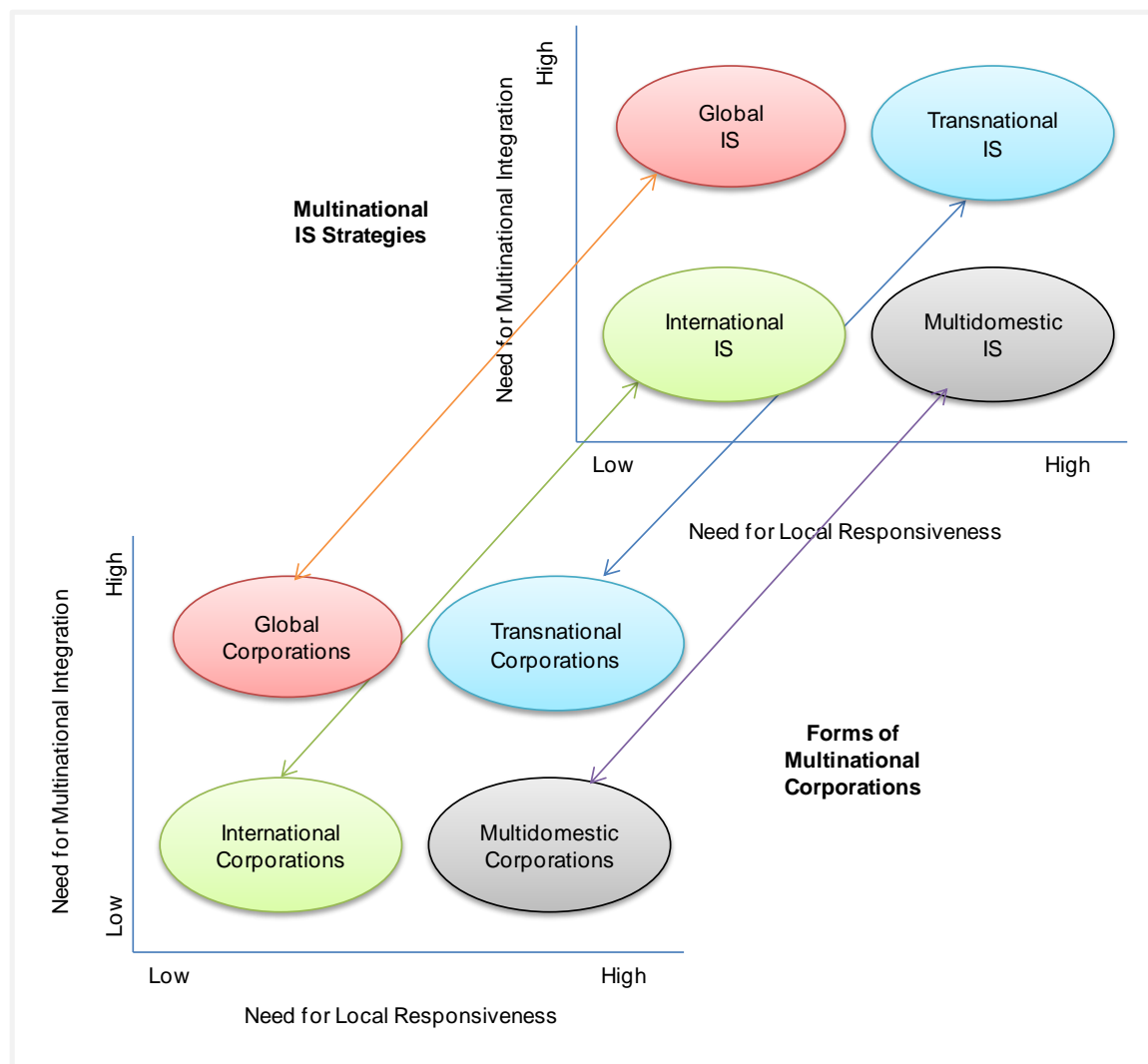

Figure 1. Global Integration-Local Responsiveness Framework**.**

According to Hill (2006), global corporations (GCs) prefer to market a standardized product worldwide for economical reasons while concentrating the production, marketing, research, and development activities in a few favorable locations. In contrast, international corporations (INCs) centralize product development functions

at their headquarters or a few favorable locations, and localize their customization product offering (Hurt, 2007). Multidomestic corporations (MDCs) achieve maximum local responsiveness with the customization of their products and marketing strategies to fit local conditions. Finally, in transnational corporations (TNCs), Bartlett and Ghoshal (1989) posited the flow of skills and product offerings was between the head office and foreign subsidiary, and between foreign subsidiaries themselves. Bartlett and Ghoshal advised TNCs to develop core competencies and valuable skills in the head office as well as in foreign subsidiaries.

This paper draws upon Bartlett and Ghoshal's (1989) forms of organizations to categorize IT strategies in MNCs into global information strategies (GS), international information strategies (INS), multidomestic information strategies (MDS), and transnational information strategies (TNS) (see figure 1). The criterion of this categorization was the need for multinational integration and local responsiveness. The assumption is that the various forms of multinational information strategic planning corresponds to the different multinational IS organizational strategies. Whereas the U.N. is commonly known as an international organization, The U.N. Secretariat seems to be close to a transnational-type of organization based on Bartlett and Ghoshal's (1989) classification of MNCs.

The present study differs from earlier research by examining the proposition that transnational information strategies (TNS) could facilitate top managers' knowledge of IT. TNS organizational strategies refer to the extent to which IT core competencies reallocate within the organization. This global knowledge learning process (Hill, 2006) facilitates a bidirectional flow of skills and product offered between headquarters and subsidiaries and between subsidiaries. Effective TNS organizational strategies imply greater organizational integration. Such integration leads to more effective IT knowledge management, which is likely to have greater influence on top management. Over time, top managers' knowledge of IT increase as a result of the global learning process.

Toward a Strategic Alignment Model for MNCs

Despite almost two decades of research, Kearns and Sabherwal (2007) noted that business-IT strategic alignment in a local context continues to garner attention. Past research did not propose theoretical and empirical investigations of both content and

process perspectives of alignment for multinational corporations (MNCs) (Martinsons, Everett, and Chan, 2001). The present study addresses this limitation by drawing upon the strategic alignment model (SAM) and the typology of MNCs of Bartlett and Ghoshal (1989) to propose and test an IT strategic alignment model for MNCs (or mSAM) using the U.N. Secretariat as a field study.

Unlike the strategic alignment model (SAM) of Henderson and Venkatraman (1993), the strategic alignment model for multinational corporations (mSAM) considers the organizations where the alignment takes place. Campbell et al. (2005) noted that factors contributing to alignment depend on the nature of organizations. They added that the complexity of these factors increases in multinational corporations. Figure 2 depicts the key elements of the mSAM.
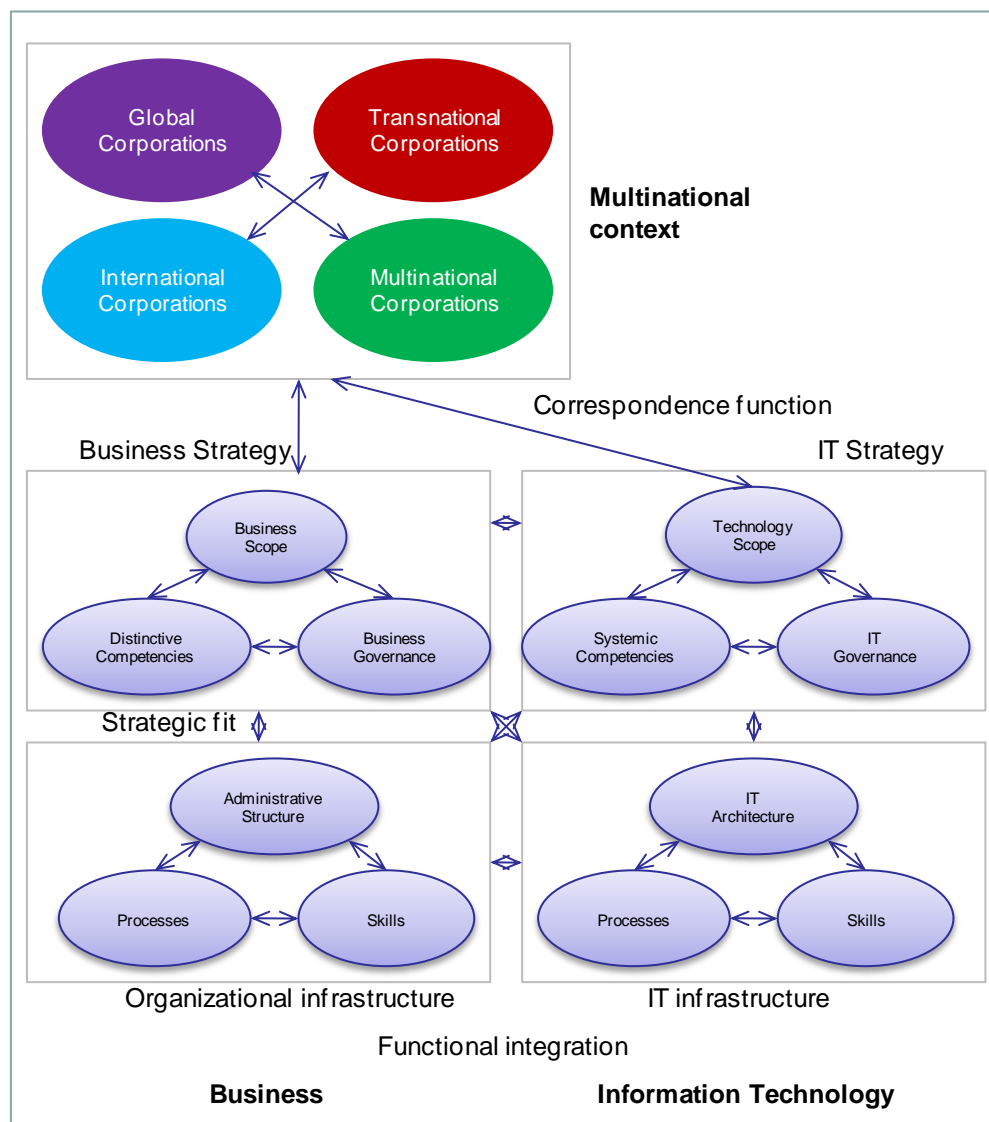

*Figure 2. S*trategic Alignment Model for Multinational Corporations (mSAM).

The strategic alignment model for MNCs (mSAM) explores business-IT relationships in multinational contexts. The mSAM encompasses five quadrants: the various types of MNCs and the four domains of the SAM. In addition to the two distinct functions (strategic fit and functional integration) of the SAM, the mSAM includes the correspondence function as a third relationship. This correspondence function illustrates the proposition that for each type of multinational corporation (international, multidomestic, global, or transnational), there is a corresponding distinctive business strategy and IT strategy. The identification of the typology of a multinational corporation determines the choice of the business strategy or IT strategy. The correspondence function is formalized as:

$$CF = CF_{BS} \; XOR \; CF_{ITS}. \tag{1}$$

$$CF_{BS} = f_1 \, (t_{MNC}) = BS \text{ and } CF_{ITS} = f_2 \, (t_{MNC}) = ITS$$

where BS = Business Strategy, ITS = IT Strategy, and t_{MNC} = topology of a multinational corporation (MNC). XOR (eXclusive OR) is the exclusive function indicating that, for a given typology of an MNC, the correspondence function f_1 relating to business strategy and the correspondence function f_2 relating to IT strategy should not be applied concurrently. The choice of f_1 assumes the consideration of the strategy execution alignment perspective of the SAM. In contrast, the application of f_2 assumes the consideration of the technology transformation perspective of the SAM.

Within the context of the mSAM, the formalization of alignment processes and their perceived outcomes are different. The formulas for alignment processes and their perceived outcomes in MNCs follow:

$$Pp = CF + SF + FI. \tag{2}$$

$$Cp = STROBE + STROEPIS + PO. \tag{3}$$

where Pp = Process perspective, Cp = Content Perspective, SF = Strategic Fit, FI = Functional Integration, CF = Correspondence Function, STROBE = Strategic orientation of business enterprises, STROEPIS = Strategic orientation of the existing portfolio of information system, and PO = Perceived Outcomes.

OPERATIONALIZATION OF CONSTRUCTS AND STUDY HYPOTHESES

Figure 3 depicts the research model for IT strategic alignment in multinational corporations (MNCs). The research model reflects the (a) multinational context of business-IT alignment, (b) processes and outcomes of business-IT alignment at functional levels, and (c) consequences of business-IT alignment on organizational performance and effectiveness. Prior researchers attempted to use the industry or domestic (or local) firm as a unit of analysis to establish a linkage between IT investments and the performance and productivity of a firm (Mahmood and Mann, 2005) and between IT strategic alignment and business value of IT (Kearns and Sabherwal, 2007).
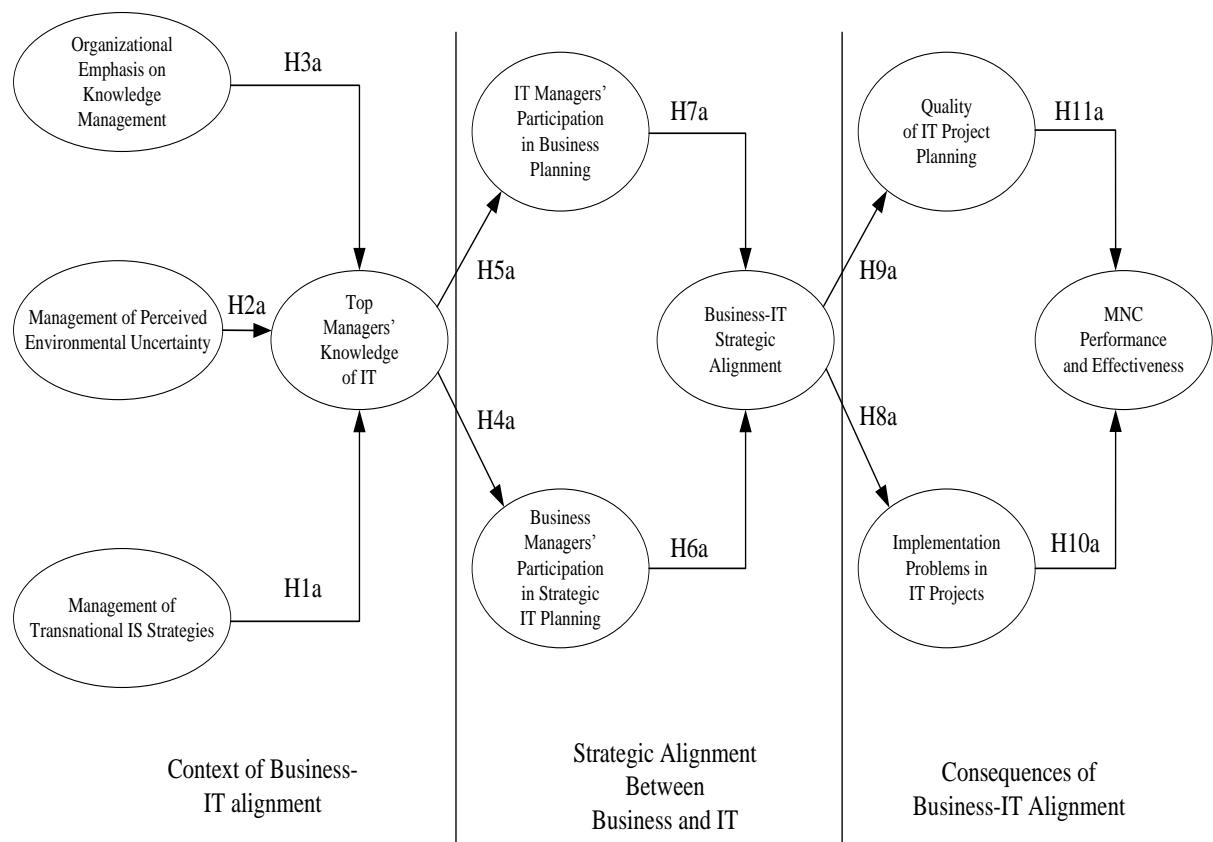
Figure 3. Research Model for IT Strategic Alignment in Multinational Corporations

The research model includes 10 constructs and 11 hypotheses. This model reflects outcomes and processes of business-IT strategic alignment at the organizational and functional levels. The first four constructs of the model represent organizational-level variables that reflect the multinational context in which alignment takes place. The next three constructs correspond to process variables followed by two outcome

variables at the unit level. Finally, the dependent variable represents organizational-level outcomes resulting from the unit-level processes and outcomes.

The research study involves 11 hypotheses to measure the independent and dependent variables. These hypotheses derive from the positivistic field survey study in the research methodology to answer the following research questions:

1. Based on knowledge management (KM) processes, how do planning behaviors (participation of IT managers in business planning and participation of business executives in strategic IT planning) and the support of top-management of IT mediate the effects of three contextual factors (organizational emphasis on KM, management of the perceived environmental uncertainty, and integration of IT decisions) on business-IT strategic alignment in the U.N. Secretariat?

2. How do aspects of IT projects mediate the association between IT strategic alignment and the U.N. Secretariat performance and effectiveness?

The 11 hypotheses to measure the independent and dependent variables are the following:

$H1_a$: Management of transnational IS strategies is significantly positively linked with top managers' knowledge of IT in the U.N. Secretariat.

$H2_a$: Management of the perceived environmental uncertainty is significantly positively linked with top managers' knowledge of IT in the U.N. Secretariat.

H3a: Organizational emphasis on knowledge management is significantly positively linked with top managers' knowledge of IT in the U.N. Secretariat.

H4a: Top managers' knowledge of IT is significantly positively linked with the participation of business executives in strategic IT planning in the U.N. Secretariat.

H5a: Top managers' knowledge of IT is significantly positively linked with IT managers' participation in business planning in the U.N. Secretariat.

H6a: Business managers' participation in strategic IT planning is significantly positively linked with business-IT strategic alignment in the U.N. Secretariat.

H7a: IT managers' participation in business planning is significantly positively linked with business-IT strategic alignment in the U.N. Secretariat.

H8a: Business-IT strategic alignment is significantly negatively linked with implementation problems in IT projects in the U.N. Secretariat.

H9a: Business-IT strategic alignment is significantly positively linked with the quality of IT project planning in the U.N. Secretariat.

H10a: Implementation problems in IT projects is significantly negatively linked with the U.N. Secretariat performance and effectiveness.

H11a: The quality of IT project planning is significantly positively linked with the U.N. Secretariat performance and effectiveness.

Management of Transnational IS Strategies

Two items reflecting transnational IS strategies in the U.N. Secretariat based on Bartlett and Ghoshal's (1989) research are used to measure the management of Transnational Strategies (TNS). The first item is used to measure the extent to which IT skills flow between the headquarters in New York and offices away from headquarters, including peacekeeping field offices (SHOA). The second item is used to measure the extent to which IT skills flow between offices away from headquarters, including peacekeeping field offices (SOAH). The third item is used to measure the extent to which IT products flow between the headquarters in New York and offices away from headquarters, including peacekeeping field offices (PHAO). The fourth item is used to measure the extent to which IT products flow between offices away from headquarters, including peacekeeping field offices (POAH). Finally, the fifth item is used to measure the extent to which IT skills are developed in the headquarters in New York as well as other locations away from the headquarters (ISHO).

Management of Perceived Environmental Uncertainty

The construct of management of Perceived Environmental Uncertainty (PEU) involves the relationships between PEU and top managers' knowledge of IT in the UN Secretariat. Top managers include those in middle management and above. An adapted version of the PEU scale proposed by Miles and Snow (1978) is used to measure this construct. According to Miles and Snow, this scale encompassed 25 items, with six subscales containing from two to six items each, corresponding to six key sectors of corporate external environments. The paper uses three subscales (suppliers, customers, and government). Each of these subscales has one item. The first item reflects the influence of increased technological opportunities to IT planning processes (IPTO). The second item reflects the influence of political uncertainties on IT planning processes in member states (PUPP). Finally, the third item measures the influence of the needs of member states on IT planning processes (IMSP).

Organizational Emphasis on Knowledge Management

Five items from previous research (Kearns and Sabherwal, 2007; Yeo, 2003) are used to measure the construct Organizational Emphasis on Knowledge Management (OKM). Two of these items reflect the organization's attitude toward knowledge (KIAO) and knowledge management processes (CADK). The other three items indicate (a) the manifestation of such emphasis on knowledge management within the organization (RAKO) and (b) that workers who emphasize knowledge management

have access to corporate knowledge (OKCA) and processes for identifying and exploiting the knowledge (PIEK).

Top Managers' Knowledge of IT

Six items based on prior literature (Armstrong and Sambamurthy, 1999; Kearns and Sabherwal, 2007; Ranganathan and Sethi, 2002) are used to measure the construct of Top Managers' Knowledge of IT (TMK). The first three items is used to measure the management's recognition of IT (a) as competitive tools (RICT), (b) as tools that increase the productivity of professional staff (RITP), and (c) as means to increase the productivity of support staff (RIMP). The next two items are used to measure top managers' knowledge about corporate IT assets and opportunities (MKAO) and top managers' recognition of the strategic potential of IT (MRSI). The last item reflects the top managers' beliefs that IT contributes to organizational performance (MBOP).

Substantive Managers' Participation in Strategic IT Planning

Four of the five items of prior research (Kearns and Sabherwal, 2007; Segars and Grover, 1999) are used to measure the construct Substantive Managers' Participation (SMP). The first two items focus on IS planning (MSIP and PISU). The remaining two items are used to identify tasks related to IT planning such as evaluating future information needs of managers from substantive divisions (INSD) and involving managers from substantive divisions in the selection of major IT investments (MSIV).

IT Managers' Participation in Program Planning

Three items measure the construct IT Participation (ITP). The first item is used to evaluate the participation level of IT managers in program planning meetings (IMPM). The second item is used to measure the participation of IT managers in setting business goals and strategies (IMGS). The third item (IMPP) reflects IT managers' early involvement in major project planning (Kearns and Sabherwal, 2007; Ranganathan and Sethi, 2002).

Business-IT Strategic Alignment

Four items based on prior research literature (Kearns and Sabherwal, 2007; Segars and Grover, 1999) are used to measure the construct Alignment (ALN). This construct is used to assess the level of integration between IT and business. The first three items are used to measure the extent to which IT plans (a) align with corporate missions, goals, objectives, and strategies (IPGO); (b) contain quantified goals and objectives (IPQG); and (c) include detailed activities to support the organization's direction (IPSD). The remaining item is used to measure the prioritization of major IT investments and their effect on business performance (IIBP).

Implementation Problems in IT Projects

Five items based on prior literature on IT project failures (Aladwani, 2002; Kearns and Sabherwal, 2007; Mahamey and Lederer, 2003) are used to measure the construct Problems in IT Projects (PROB). This construct has reverse coded items with high values indicating undesirable conditions. These items are used to measure (a) the possibility of the organization to experience difficulties during the implementation of major IT projects (DIPC), (b) unclear delineation of responsibilities and authorities (DIUR), (c) unclear statement of overall goals (DIUS), (d) the implementation requiring more time than planned (DIIT), and (e) the lack of clear communications among participants (DILC).

Quality of IT Project Planning

Six items based on prior research on project planning (Aladwani, 2002; Archibald, 1988) and IT project planning (Glaser, 2005; Kappelman, McKeeman, and Zhang, 2006; Kearns and Sabherwal, 2007; Robinson, 2005) are used to measure the construct Quality of Project Planning (QPP). This construct is used to assess the quality of strategic aspects of IT project planning (IPCO) and operational aspects of IT project planning (IPRE to IPCP). The first item is used to measure organizational emphasis on the identification of IT projects that match with corporate objectives (IPCO). The remaining five items are used to assess (a) realistic and achievable resource estimates (IPRE), (b) scope estimates (IPSE), (c) staffing plans (IPSP), (d) resource timelines (IPAT), and (e) elaboration of explicit communication plans (IPCP).

MNC Performance and Effectiveness

Four items based on Yeniyurt's (2003) non-financial metrics of the performance measurement framework for multinational corporations (MNCs) are used to measure the Performance and Effectiveness (MPE) construct in the U.N. Secretariat. The first item is used to measure the contribution of IT to increase the satisfaction of member states and staff members (IIMS). The other items are used to assess the extent to which (a) IT facilitates significant learning and innovation (ITLI), (b) IT contributes significantly to improve internal processes (ITIP), and (c) IT supports the creation of new organizational culture and climate (ITCC).

RESEARCH METHODS

The Research Instrument

The present study uses a field survey design to collect data with a stratified random sampling of 263 IT and business managers in the U.N. Secretariat. The levels of managers and their functional areas are the two variables of the stratification. The questions on the survey are derived from the areas of concern involved in the research study.

A closed-ended, seven-point Likert-type scale is used to measure all constructs. In total, 53 items measure the 10 constructs and general demographics, based on the questionnaire developed from the literature review. This questionnaire contains available items adapted from previously tested instruments. The study uses structural

equation modeling (SEM) techniques (Jöreskog and Sorbom, 1989) to analyze data collected through the stratified random sampling of the two groups of managers.

This study is a theoretical contribution to the U.N. management reform process. The research of Bartlett and Ghoshal (1989) provided a framework for the present study on business-IT strategic alignment for the U.N. Secretariat. The U.N. Secretariat encompasses three categories of offices: (a) headquarters, departments, and offices in New York; (b) peacekeeping field missions; and (c) offices away from headquarters. The target population for this research study consists of 5,523 IT and business managers working with one of the 50 offices in the U.N. Secretariat. The study population is a stratified random sampling of 263 managers from the target population. The sample consists of 166 IT managers and 97 business managers. The U.N. Secretariat is a complex, multinational corporation with offices geographically located in Africa, America, Asia, and Europe. As such, the study is conducted within an international context.

SURVEY RESULTS

Data Analysis

The response rate was 24%. Two hundred and sixty three people received the survey link via email. The sample consisted of 166 IT managers and 97 business managers from 50 departments in the U.N. Secretariat. From the 263 surveys distributed, 64 were returned, filled out completely, from 38 IT managers and 26 business managers including nine female and 55 male. Of the 64 participants, one D2, eight D1, 11 P5, 30 P4, 14 other categories of personnel, 10 were age 35-45, 54 were over the age of 45, and no participants were younger than 35.

Of the 64 participants, 3% hold a high school/GED, 1% has a college degree, 17% has a 3 or 4-year college degree (BA, BS), 51% completed a master's degree, 18% earned a doctorate degree, and 7% has another type of degree. The number of years of experience of the participants in their area of expertise in the U.N. Secretariat and before joining the Secretariat varies respectively from 10 to 40, 3 to 28, and 2 to 36.

Reliability and Validity

The measures used in this paper were statistically validated. SPSS 16.0 statistical software was used to assess the reliability and the validity of the measures in the exploratory phase. To evaluate the appropriateness of the items, a principal

components factor analysis and Cronbach's alpha was conducted. Construct validity (convergent and discriminant validity) was assessed using the standardized factor loading, variance extracted estimates, the Pearson correlations among constructs, shared variances, and confirmatory factor analysis.

Exploratory Factor Analysis

The main applications of factor analytic techniques were (a) to reduce the number of variables and (b) to detect structure in the relationships between variables (Cooper and Schindler, 2003). Exploratory factor analysis (EFA) was conducted, based on principal components analysis method with varimax rotation. In the present research study, the Kaiser-Meyer-Olkin (KMO) was greater than .7 at .701 and Bartlett's statistic was significant [χ^2 (703) = 2174, p < .001]. The KMO and Bartlett's statistics assessed whether there were patterns of correlations in the data that indicated that factor analysis is suitable. The KMO measure of sampling adequacy ranges from 0 to1, with higher values indicating greater suitability. According to Cooper and Schindler, this value should be greater than .70. Based on these results, EFA was suitable for this data set.

The factor analysis resulted in nine factors with eigenvalues > 1.0, explaining 79% of the variance. Each of the nine factors in the measurement model exhibited satisfactory reliability. Loadings above .50 were selected for each factor. The lowest primary loading was .57. One item (IPTO) had a secondary loading of .53. Item IPTO loaded high on the planning factor. The following items MKAO, MRSI, and MBOP respectively had secondary loadings of .41, .42, and .47. Item definitions are provided in Appendix C.

The research model does better for all variables. The communalities for all variables ranged from .660 to .903. The individual communalities indicated how well the model was working for the individual variables, and the total communality gives an overall assessment of performance. In this research study, the total communality was 30.29. The proportion of the total variation explained by the nine factors is .797. This percentage is the same as the proportion of variation explained by the first nine eigenvalues, obtained earlier. Appendix A provides factor loadings obtained from the

EFA. On the basis of the factor analysis, the number of items was reduced, shortening the questionnaire to 38 items.

Internal Reliability

Internal reliability (ranges between 0 and 1) is a measure based on the correlations between different items on the same test. Cronbach's alpha, a statistic calculated from the pairwise correlations between items, measures internal consistency. An alpha of .60 to .70 indicates acceptable reliability, and .80 or higher indicates good reliability (Cooper and Schindler, 2003). In this study, alpha coefficients were calculated, using SPSS 16.0 (see Appendix B). Eight coefficients indicated a good reliability (.82 to .93) and one coefficient (.65) indicated acceptable reliability.

Construct Validity

Construct validity was assessed, using convergent and discriminant validity. Convergent validity refers to the degree by which study items measured the underlying latent factor. In this study, convergent validity was established by reviewing the t-tests for the factor loadings. All standardized factor loadings were above .40 (see Appendix A) and the lowest t-value is 9.00 (p < .05), considerably exceeded the standard of 2.00 (Anderson and Gerbing, 1988).

Discriminant validity refers to the degree to which items differentiate between constructs. Discriminant validity was assessed through the use of variance extracted test. Constructs were evaluated by comparing the variance extracted estimates for two factors and then compared with the square of the correlation between the two factors. The Pearson correlations among constructs (below the diagonal) and squared correlations (above the diagonal), and the variance extracted estimates in boldface (along the diagonal) are shown in Appendix B.

Discriminant validity is demonstrated if both variance extracted estimates are greater than the squared correlation. In the present study, the correlation between the factors OKM and PEU was .13; the squared correlation was .01. The correlations and squared correlations are shown in Appendix B. The variance extracted estimate was .83 for OKM and .81 for PEU. Because the variance extracted estimates are greater than the square of the interfactor correlation, the test supports the discriminant validity of these two factors. Examination of the other variance extracted estimates and squared correlation coefficients supported discriminant validity within the model.

Measurement Model: Confirmatory Factor Analysis

A confirmatory factor analysis was conducted with SEM with the help of LISREL 8.8 multivariate analytical software using the maximum likelihood estimation (MLE) method to test reliability, validity, and measures of fit. Several indices were obtained to assess the model fit (Jackson, Gillaspy, and Purc-Stephenson, 2009): (a) ratio χ^2/degrees of freedom (χ^2/df), (b) goodness of fit index (GFI), and (c) root mean square error of approximation (RMSEA). Additional indices include the (d) standardized root mean square residual (SRMSR), (e) normed fit index (NFI), (f) nonnormed fit index (NNFI), and (g) the comparative fit index (CFI).

The measurement model exhibited a fairly good fit, with χ^2/df ratio of 1.81, RMSEA of .076, SRMSR of .16, NFI of .80, NNFI of .89, CFI of .90, and GFI of .57. According to Dow et al. (2008), a ratio χ^2/df below 3 indicates a good fit. Dow et al. added that for NFI, values above .80 are considered good, whereas for NNFI and CFI indices, values above .90 are considered good. For acceptable fit, RMSEA should be below .08, and SRMSR should be below .10.

Path Analysis

After the path diagram was hypothesized, the next stage in LISREL was to convert the path diagram into a more formal set of structural and measurement models. This process was accomplished through a set of equations that define (a) the structural equations linking the constructs, (b) the measurement model specifying exogenous and endogenous variables, and (c) a set of matrices indicating any hypothetical covariances among the constructs or variables. The goal for this stage was to develop a connection between the operational definitions of the constructs and the theory for the proper test.

Simplis language was used to specify the commands for LISREL analysis (Dow et al., 2008). The study used the correlation coefficient matrix of the measured variables as an input. The results of LISREL 8.8 using the model and observed variables led to a not converged statement. The main reasons were too many parameters (as stated in the LISREL's warning statements) and a small number of participants ($n = 64$).

Composite scores and a correlation analysis between factors were conducted. Figure 4 summarizes the results of the composite scores and correlation analysis.
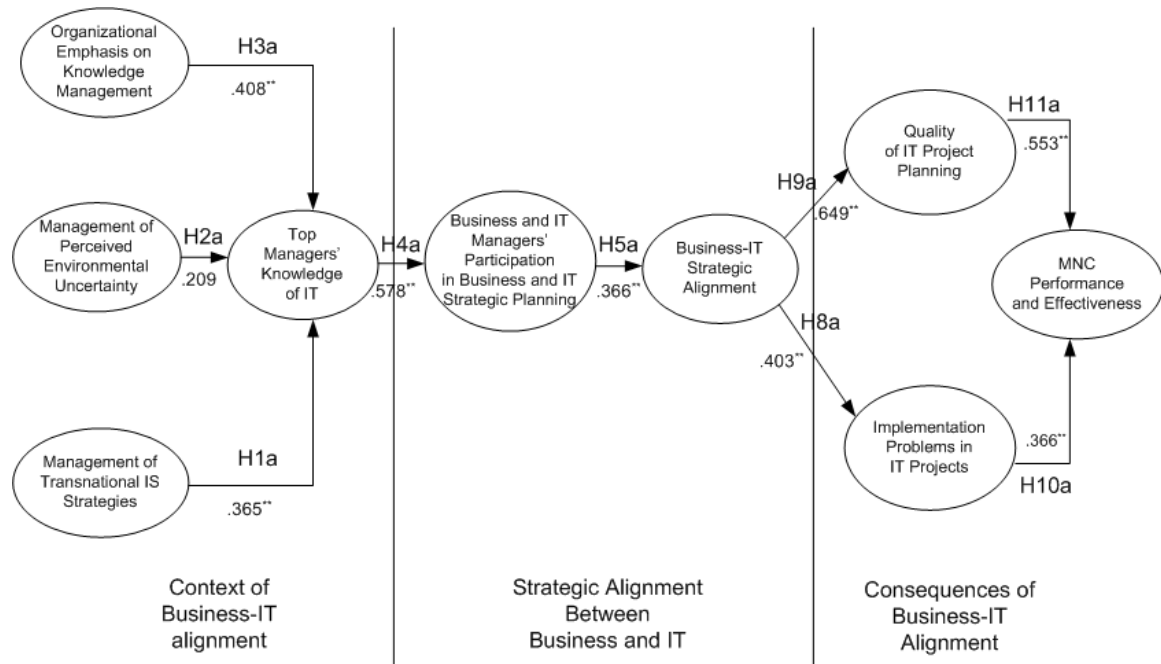

Figure 4. Final Structural Model for the U.N. Secretariat.

Notes: Fit indicators: RMSEA = .076, SRMSR = .16, NFI = .80, NNFI = .89, CFI = .90, GFI = .57. * and ** indicate significance at .05 and .01 levels, respectively.

Findings

Nine hypotheses were statistically significant ($p < .01$). The first hypothesis (Hypothesis 1a) indicated that management of transnational IS strategies is positively linked with top managers' knowledge of IT in the U.N. Secretariat ($r = .36$, $p < .01$). The second hypothesis (Hypothesis 2a) indicated that no significant relationships between management of the perceived environmental uncertainty and top managers' knowledge of IT in the U.N. Secretariat. The third hypothesis (Hypothesis 3a) indicated that organizational emphasis on knowledge management is positively linked with top managers' knowledge of IT in the U.N. Secretariat ($r = .40$, $p < .01$).

The results of the correlation analysis (Hypotheses 4a and 5a) indicated that top managers' knowledge of IT is positively linked with the participation of business and IT executives in program and strategic IT planning in the U.N. Secretariat ($r = .57$, $p < .01$). Hypotheses 6a and 7a indicated that business and IT managers' participation in program and strategic IT planning is positively linked with business-IT strategic alignment in the U.N. Secretariat ($r = .36$, $p < .01$).

Hypothesis 8a indicated that business-IT strategic alignment is positively linked with implementation problems in IT projects in the U.N. Secretariat ($r = .40$, $p < .01$). Hypothesis 9a indicated that business-IT strategic alignment is positively linked with the quality of IT project planning in the U.N. Secretariat ($r = .64$, $p < .01$). Hypothesis 10a indicated that implementation problems in IT projects is positively linked with the U.N. Secretariat performance and effectiveness. Hypothesis 11a indicated that the quality of IT project planning is positively linked with the U.N. Secretariat performance and effectiveness.

Discussions

The objective of this study was to provide insights into business-IT strategic alignment and its effects on performance and effectiveness of a multinational corporation (MNC). Two specific research questions were pursued: (a) Based on knowledge management (KM) processes, how do planning behaviors and the support of top-management of IT mediate the effects of three contextual factors on business-IT strategic alignment in the U.N. Secretariat? (b) How do aspects of IT projects mediate the association between IT strategic alignment and the U.N. Secretariat

performance and effectiveness? Hypotheses related to these research questions were tested, using survey data from 263 business and IT executives in the U.N. Secretariat.

To provide a response to the first research question, the knowledge-based theory of the firm (Jones, 2006; Levitas and Ndofor, 2006) and multinational theory (Bartlett and Ghoshal, 1989) were used to develop a model. The model was helpful in testing the relationships among three contextual factors (organizational emphasis on knowledge management, management of perceived environmental uncertainty, and management of transnational IS strategies) and top managers' knowledge of IT, IT managers' participation in business planning , business managers' participation in strategic IT planning, and business-IT alignment. The results supported most of the hypotheses related to the first question.

The top managers' knowledge of IT in the U.N. Secretariat is affected by management of transnational IS strategies and organizational emphasis on knowledge management (Hypothesis 1a and Hypothesis 3a). The relationship between management of the perceived environmental uncertainty (PEU) and top managers' knowledge of IT in the U.N. Secretariat (Hypothesis 2a) is statistically significant but low. The test of the structural model indicated the need to include additional observed variables to the construct of PEU. The participation of business and IT executives in program and strategic IT planning in the U.N. Secretariat is affected by top managers' knowledge of IT as posited in Hypothesis 4a and Hypothesis 5a. Business and IT managers' participation in business and IT project planning influenced business-IT strategic alignment in the U.N. Secretariat (Hypotheses 6a and 7a). This test of the structural model did not indicate the need to include any of the excluded items and paths. The results related to the first research question supported the relevant hypotheses.

The results related to the second research question supported two hypothesized relationships. Business-IT strategic alignment affects the quality of IT project planning (Hypothesis 9a), which influences the U.N. Secretariat performance and effectiveness (Hypothesis 11a). The results indicated that business-IT strategic alignment may be important to the U.N. Secretariat performance and effectiveness because it leads to quality of IT project planning.

The results indicated that business-IT strategic alignment is positively linked with implementation problems in IT projects in the U.N. Secretariat (Hypothesis 8a). The results also indicated that implementation problems in IT projects are positively linked with the U.N. Secretariat performance and effectiveness (Hypothesis 10a). The results are consistent with those of Kearns and Sabherwal (2007) who showed that planning-related difficulties play a minor role as mediating variables because (a) knowledge integration and quality plans mitigated the effect of these difficulties and (b) obstacles are more quickly addressed with a shared understanding of project goals and requirements.

Implications to Leaders in the U.N. Secretariat and in MNCs

The implications to leadership in the U.N. Secretariat are also relevant for leaders in multinational corporations (MNCs). The results of the study highlighted (a) the role of knowledge considerations in the relationship between contextual factors and alignment in the U.N. Secretariat, and (b) the role of IT projects in the relationship between alignment and organizational performance and effectiveness in the U.N. Secretariat. Leaders should consider the implications of these findings.

McAfee (2004) noted that companies spent significant financial resources for unused technology. This IT investment paradox (Anderson, Banker, and Ravindran, 2003) relates to the lack of alignment between business goals and IT strategies. The alignment of global IT strategies and integrated business objectives and goals is critical to the success of multinational organizations in a highly competitive global market.

The report on ICT strategy and management framework for the U.N. Secretariat (UNGAR, 2008) prepared in accordance with paragraph three of the General Assembly resolution 60/283 of July 2006 (UNGAR, 2006) recognized the strategic importance of ICT as a critical reform instrument. For the successful implementation of the recommendations of the report adopted by the General Assembly, the results of this study have at least four implications to leaders in the U.N. Secretariat:

     1. The effects of top managers' knowledge of IT on strategic business-IT alignment

     2. The importance of business-IT alignment to organizational performance and effectiveness

3. The importance of internal context to knowledge integration

4. The role of senior management in knowledge management and strategic management of IT.

First, the results of the study indicated that business and IT managers perceive the influence of top management on the production of organizational knowledge by affecting the production process. The top managers' knowledge of IT has major effects on IT strategic alignment through planning behaviors and subsequently on organizational performance and effectiveness through the quality of IT project planning. Top managers should receive training to increase their IT knowledge and understanding on the business value of IT because such knowledge can help to improve organizational performance and effectiveness. Planning behaviors involve regular meetings between IT managers and business executives to (a) increase the trust between the two categories of executives, (b) provide insights to business managers into technical perspectives, and (c) improve the understanding of IT managers on the business value of IT.

This research study enriched the leadership knowledge and literature by highlighting the relationships among leadership theories (trust, socialized, innovative, and transformational-transactional) and IT strategic alignment in the U.N. Secretariat. Henshaw (2008) viewed organizations as cultures and consequently systems of shared understanding. Planning behaviors may move social understanding or trust between business and IT managers in the desired direction to achieve corporate objectives because trust breeds collaboration and reciprocation and trust leadership instills genuine commitment. According to Brymer and Gray (2006), the four behavioral dimensions of the transformational-transactional leadership are (a) idealized influence, (b) inspiration, (c) intellectual stimulation, and (d) individual consideration. Planning behaviors may improve the exchanges between business and IT executives by influencing their inspirational, intellectual, and individual behaviors.

Second, the results highlighted the importance of business-IT alignment to organizational performance and effectiveness. The results of the research study indicated that business-IT strategic alignment is positively linked with the quality of IT project planning in the U.N. Secretariat. Kappelman, McKeeman, and Zhang

(2006) subdivided the research on project planning into operational and strategic perspectives. Strategic aspects focus on (a) the identification of projects that match with corporate objectives or (b) the analysis and selection of a project from several capital expenditures alternatives (or capital budgeting of IT investments). Operational aspects referred to a process specifying project timelines, milestones, equipment, workforce, and budget (Aladwani, 2002). The results showed that quality of strategic and operational planning of IT projects is a key mediating variable in the relationship between business-IT strategic alignment and organizational performance and effectiveness.

Third, the results highlighted the importance of internal context to knowledge integration. Organizational emphasis on knowledge management (KM), management of perceived environmental uncertainty (PEU), and management of transnational IS strategies are important antecedents to top managers' knowledge of IT, and consequently, are significant to the integration of business and IT. The management of transnational IS strategies, management of PEU, and emphasis on KM were important antecedents to top manager's knowledge of IT and consequently are significant to the integration of business and IT. Top managers would likely have knowledge of IT in a transnational corporation with a good KM and management of PEU. In transnational corporations (TNCs), the flow of skills and product offerings occurred between the head office and foreign subsidiary, and between foreign subsidiaries themselves (Bartlett and Ghoshal, 1989). Bartlett and Ghoshal (1989) advised TNCs to develop core competencies and valuable skills in the head office as well as in foreign subsidiaries.

Finally, the results highlighted the role of senior management in knowledge management (KM) and strategic management of IT. Business and IT managers believed that top managers' knowledge of IT can facilitate the management of environmental uncertainty, the management of transnational IS strategies, and KM activities. KM is a process that includes five primary activity classes (acquisition, selection, generation, assimilation, and emission) and four secondary activity classes (Holsapple and Singh, 2001). The secondary activity classes relate to the management and leadership of a KM initiative (Jones, 2006). The roles of IT leaders are to understand the business value of IT, use IT to uncover values opportunities, and

educate and convince business executives. The successful implementation of IT knowledge management and IT projects within the U.N. Secretariat may require transformational, innovative, and IT leadership.

Study Limitations

The present study has the following limitations. The reliance on multiple participants and perceptual data in a single organization comprised the major limitation. The study focused on the perceptions of multiple participants because perceptions of a single participant can lead to common source bias (Kearns and Sabherwal, 2007). Strategic IT planning activities (respectively business strategic planning) was not an exclusive responsibility of the corporate chief information officers (respectively corporate executive officers) because they included activities associated with setting objectives, operationalizing these objectives, developing a long-term plan for achieving them, and implementing this plan (Das et al., 1991). Finally, empirical experiences showed middle-level managers' contribution to the strategic IT planning and business strategic planning processes and maintenance of the appropriate balance between global integration and local responsiveness of MNC business strategies and information systems (King and Sethi, 1999).

A second limitation of the study was to limit the participants to middle-level and senior managers. Junior managers (P3 levels and below) were usually part of IT and business planning processes in the U.N. Secretariat. This limitation reduced the response rate that may increase if the sample included junior managers.

A third limitation of the study was the conceptualization of IT decision-making process in a transnational corporation (Bartlett and Ghoshal, 1989) like the U.N. Secretariat. The management of transnational information systems strategies measures the roles of some remote offices of the U.N. Secretariat in the transnational strategy. Prior research (Kearns and Sabherwal, 2007; King and Sethi, 1999) used centralization of IT decisions to measure IT management's control over IT resources.

A fourth limitation of the study was the use of cross-sectional data. Cross-sectional data might preclude an analysis of the potential effect of the dependent variable upon antecedents (Kearns and Sabherwal). MNC performance and effectiveness and

business managers' participation in strategic IT planning might increase top managers' knowledge of IT.

Finally, the use of the model development strategy with LISREL was a major limitation. The model development strategy differs from the strictly confirmatory and competing models approaches in that the researcher sought to improve the model by modifying the structural and measurement models (Cooper and Schindler, 2003). Cooper and Schindler argued that this approach can be problematic if the post hoc models that are confirmed do not fit new data.

Suggestions for Future Research

The present study has implications for future research. First, the study linked multinational contexts to strategic alignment and organizational performance and effectiveness. Results showed strong associations between management of transnational IS strategies and top managers' knowledge of IT in the U.N. Secretariat. The research model contributed to knowledge-based theory of multinational corporations (MNCs) by showing how multinational contextual factors can affect shared domain knowledge and how the shared domain knowledge can enable knowledge integration and improve organizational performance and effectiveness. Kearns and Sabherwal (2007) examined the same results for local or domestic contexts. Further research is needed to examine these results and investigate whether they are reproduced, using other types of multinational corporations.

Second, the results of study indicated that no significant relationships between management of the perceived environmental uncertainty and top managers' knowledge of IT in the U.N. Secretariat existed. Kearns and Sabherwal (2007) suggested investigating the effects of environmental factors that might be potential antecedents to IT strategic alignment. These results might be related to the limited number of observed variables for the construct of management of perceived environmental uncertainty (PEU). Miles and Snow (1978) proposed a scale of 25 items, with six subscales containing from two to six items each, corresponding to six keys sectors of corporate external environments.

Third, two constructs (IT managers' participation in program planning and substantive managers' participation in strategic IT planning) were merged into a single construct because their items loaded onto the same factor (Participation). The results indicated that top managers' knowledge of IT is positively linked with the participation of substantive and IT executives in program and strategic IT planning in the U.N. Secretariat. The results also indicated that substantive and IT managers' participation in program and strategic IT planning is positively linked with business-IT strategic alignment in the U.N. Secretariat. Future research would benefit from combining these aspects into a single construct, which usually has been separated into two constructs.

Finally, this study was designed to investigate (a) the role of knowledge management processes in the relationship between contextual factors and alignment in the U.N. Secretariat, and (b) the role of IT projects in the relationship between alignment and the performance and effectiveness of the U.N. Secretariat. The four items used to measure the MNC Performance and Effectiveness (MPE) construct were derived from Yeniyurt's (2003) non-financial metrics of the performance measurement framework for multinational corporations. Further research is needed to examine these results and investigate whether they are reproducible for-profit multinational corporations and financial indicators.

Recommendations for Leadership

The main recommendation of this study is the business-IT strategic alignment implementation model for MNCs (mSAIM). The mSAIM model (see figure 5) draws upon the proposed business-IT strategic alignment model for MNCs (mSAM) which covers process and content perspectives of the interrelationship between business and IT for this category of organizations. The mSAIM model summarizes the recommendations for leaders at the U.N. Secretariat and in MNCs. The model includes five components: (a) strategic business planning, (b) leadership competencies, (c) IT knowledge management, (d) IT project planning, and (e) IT strategic management. Each module contains various elements.
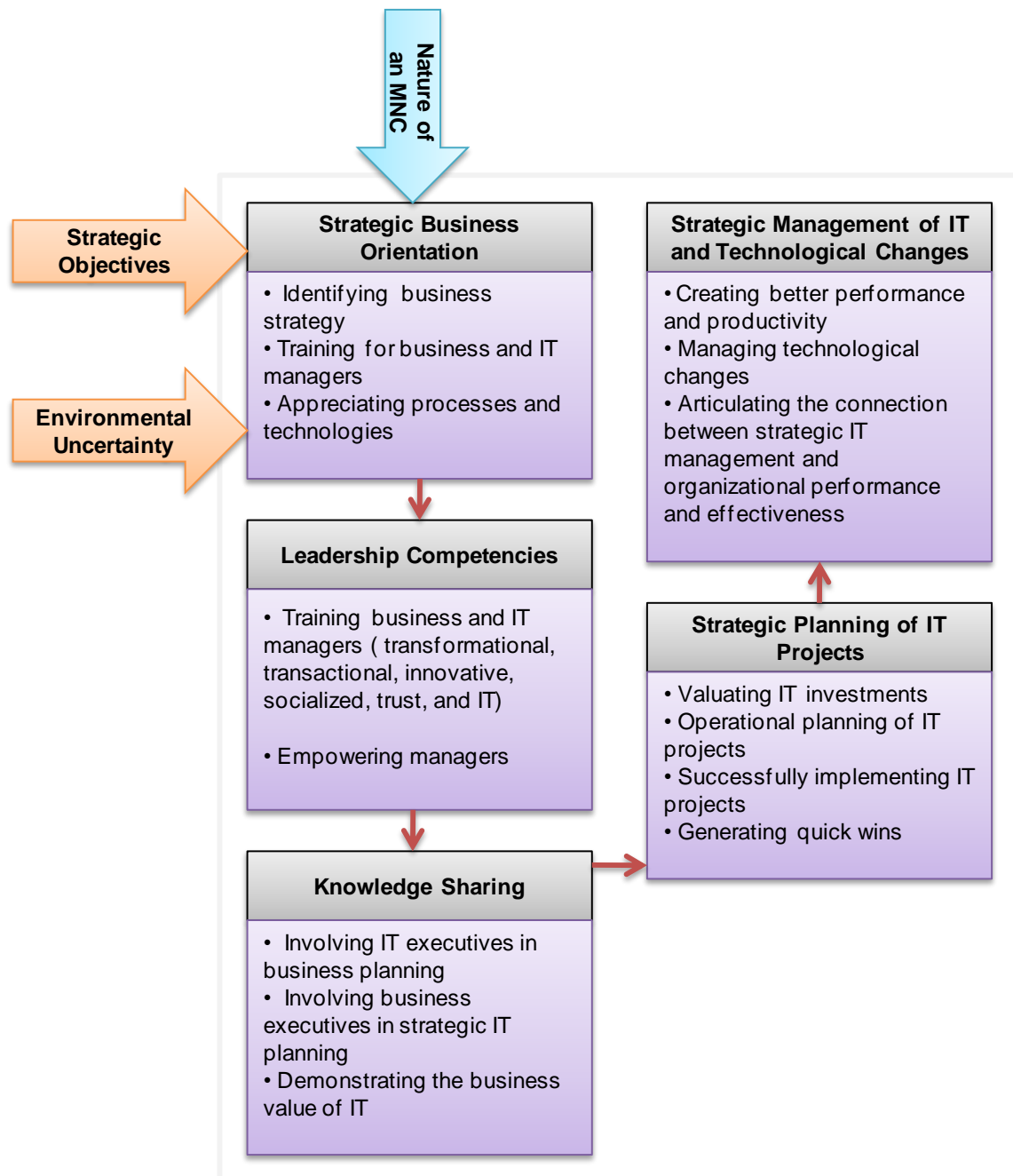
Figure 5. The business-IT strategic alignment implementation model for MNCs (mSAIM)

The first component is the strategic business planning, which is a function of the nature of MNCs and corporate objectives. Many scholars proposed various models of strategy: (a) typology of strategy (Miles and Snow, 1978), three generic strategies (Porter, 1980; 1986), and the strategy framework model (Mintzberg et al., 2002). Within the context of business-IT strategic alignment, shared domain knowledge referred to the appreciation and understanding among business and IT managers for

the processes and technologies that have an effect on their mutual productivity (Reich and Benbasat, 2000). Shared domain knowledge could also relate to the understanding of the strategic business orientation of the organization. Leaders in the U.N. Secretariat and in MNCs should clarify their business strategy and conduct appropriate trainings for substantive and IT managers.

The second component concerns the development of leadership competencies of business and IT executives within the organization. Successful knowledge sharing behaviors (business managers' participation in IT planning and IT managers' participation in business planning) requires different leadership competencies including transformational-transactional, innovative, IT-aware, trusting, and socialized. Socialized and trust leadership trainings, for example, can facilitate socialization. Socialization between business and IT executives may facilitate knowledge integration, the identification and selection of projects, and their strategic planning aspects. Socialization processes may facilitate consensus between the objectives and goals set at the different levels of the corporate management hierarchy. These processes may also facilitate change management activities, improve corporate resources allocation, and limit confusion. Knowing when to apply these leadership competencies is an important aspect of business-IT strategic alignment.

The third component of mSAIM is IT knowledge management. This component is part of the shared domain knowledge. Sharing knowledge consists of communicating knowledge to other individuals through exchange, internalization, externalization, and training (Sabherwal and Sabherwal, 2005). The facilitation of IT knowledge sharing across substantive and IT executives can be possible through a number of knowledge management processes within the MNC.

IT project planning is the fourth component of the mSAIM model. IT project planning includes operational and strategic perspectives (Kappelman, McKeeman, and Zhang, 2006). The analysis and selection of a project from several capital expenditures alternatives is a strategic decision (Munoz, 2006). According to Silvius (2006), traditional capital budget methods are limited to valuating IT projects because of (a) their inability to cope with risk, uncertainty, and flexibility; (b) their tendency to overlook the cost to train users, the learning curve to adapt to new technologies, and

the social subsystem costs and benefits of the IT projects; and (c) their inability to quantify intangible benefits such as improving knowledge, customer service, or decision making. Leaders in the U.N. Secretariat and in MNCs should begin to look at ways to identify alternative approaches to deterministic capital budget methodologies and prepare their substantive and IT managers on evaluating IT investments done under conditions of uncertainty.

IT strategic management is the last component of the mSAIM model. The present research study highlighted the mediating roles of IT project planning and implementation problems in IT projects. The results highlighted that the two aspects of IT projects affect organizational performance and effectiveness and require a strategic management of technological changes. Substantive and IT executives in the U.N. Secretariat perceived top managers' knowledge of IT as a facilitator of IT project planning that can lead the organization through a path that can eventually produce strategic values.

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Appendix A: Factor Loadings

Variables	Factor 1: Knowledge Management	Factor 2: Uncertainty	Factor 3: IT Strategies	Factor 4: Knowledge of IT	Factor 5: Participation	Factor 6: Alignment	Factor 7: Planning	Factor 8: Implementation	Factor 9: Impact
CADK	.75								
RAKO	.80								
OKCA	.78								
PIEK	.85								
PUPP		.87							
IMSP		.74							
SOAH			.81						
PHAO			.81						
POAH			.83						
RICT				.82					
RITP				.81					
RIMP				.81					
MKAO				.67	**.41**				
MRSI				.73	**.42**				
MBOP				.66	**.47**				
IMPM					.72				
IMGS					.75				
IMPP					.77				
MSIP					.80				
PISU					.76				
MSIV					.77				
IPGO						.63			
IPQG						.83			
IPSD						.77			
IIBP						.71			
IPCO						.63			
IPTO							.57		**.53**
IPRE							.73		
IPSE							.85		
IPSP							.55		
IPAT							.73		
DIUR								.71	
DIUS								.81	
DIIT								.78	
DILC								.86	
ITLI									.69
ITIP									.78
ITCC									.72

Appendix B: Alpha (α), Correlation Coefficients, and Variance Extracted Estimates

	α	OKM	PEU	TNS	TMK	MPP	ALN	QPP	PROB	MPE
Organizational Knowledge Management (OKM)	.91	**.83**	.01	.18	.16	.15	.14	.29	.04	.23
Management of Perceived Environmental Uncertainty (PEU)	.65	.13	**.81**	.06	.04	.03	.02	.00	.01	.01
Management of Transnational Strategies (TNS)	.83	.43**	.26*	**.82**	.12	.03	.16	.11	.04	.10
Top managers' knowledge of IT (TMK)	.93	.40**	.20	.36**	**.81**	.32	.29	.19	.05	.29
Business and IT managers' participation in program and IT strategic planning (MPP)	.90	.39**	.18	.19	.57**	**.81**	.12	.07	.00	.02
Business-IT strategic alignment (ALN)	.91	.38**	.15	.40**	.54**	.36**	**.77**	.40	.16	.28
Quality Of IT Project Planning (QPP)	.89	.54**	.03	.34**	.44**	.28*	.64**	**.79**	.18	.30
Implementation Problems in IT Projects (PROB)	.86	.22	-.13	.20	.23	-.01	.40**	.43**	**.76**	.12
Organizational Performance And Effectiveness (MPE)	.82	.48**	.14	.33**	.54**	.16	.53**	.55**	.36**	**.77**

Notes: Pearson correlations are given below the diagonal and squared correlations are given above the diagonal. * and ** represent significance levels of .05 and .01, respectively. Variance extracted estimates are given in boldface along the diagonal.

Appendix C: Codebook of Questionnaire Items

Code of Observed Variables	Description
Organizational Emphasis on Knowledge Management (OKM)	
KIOA	Knowledge and intellectual capital are viewed as key organizational assets.
CADK	The organization invests heavily in the capture, assimilation, and dissemination of knowledge.
RAKO	Staff members have ready access to expert knowledge within the organization.
OKCA	Organizational knowledge is codified and made available (via portals, intranets, and extranets) to all staff members.
PIEK	Staff members have processes for identifying and exploiting organizational knowledge stores.
Management of Perceived Environmental Uncertainty (PEU)	
IPTO	IT planning processes are influenced by new technological opportunities.
PUPP	Political uncertainties (such as conflict situations) in Member States influence IT planning processes.
IMSP	The needs of Member States influence the IT planning process.
Management of Transnational Strategies (TNS)	
SHOA	IT skills (such as software development, systems deployment, management, leadership, services support, etc.) flow between the Headquarters in New York and offices away from Headquarters (including peacekeeping field offices).
SOAH	IT skills (such as software development, systems deployment, management, leadership, services support, etc.) flow between offices away from Headquarters (including peacekeeping field offices).
PHAO	IT products (designs, applications, models, and services) flow between the Headquarters in New York and offices away from Headquarters (including peacekeeping field offices).
POAH	IT products (designs, applications, models, and services) flow between offices away from Headquarters (including peacekeeping field offices).
Code of Observed Variables	Description

ISHO	IT skills (software development, systems deployment, management, leadership, services support, etc.) are developed in the Headquarters in New York as well as other locations away from the Headquarters.

Top managers' knowledge of IT (TMK)

RICT	Top managers recognize IT as a competitive tool.
RITP	Top managers recognize IT as a tool to increase the productivity of professional staff.
RIMP	Top managers recognize IT as a tool to increase the productivity of support staff.
MKAO	Top managers are knowledgeable about the organization's IT assets and opportunities.
MRSI	Top managers recognize the strategic potential of IT.
MBOP	Top managers believe IT contributes to the organization's performance.

IT managers' participation in program planning (ITP)

IMPM	IT managers regularly attend program planning meetings.
IMGS	IT managers participate in setting organizational goals and strategies.
IMPP	IT managers are involved early in major projects planning.

Substantive managers' participation in strategic IT planning (SMP)

MSIP	Managers from substantive divisions are actively involved in the process of IT planning.
PISU	The level of participation in IT planning by various substantive units of the organization is high.
INSD	IT planning involves an evaluation of future information needs of managers from substantive divisions.
MSIV	Managers from various substantive divisions are involved in the selection of major IT investments.

Business-IT strategic alignment (ALN)

IPGO	The IT plan aligns with the organization's mission, goals, objectives, and strategies.
IPQG	The IT plan contains quantified goals and objectives.
IPSD	The IT plan contains detailed action plans or strategies that support the organization's direction

<div align="right">Table continued.</div>

Code of Observed Variables	Description
IIBP	The organization prioritizes major IT investments by the expected impact on business performance.

	Quality Of IT Project Planning (QPP)
IPCO	The organization emphasizes the identification of IT projects that match corporate objectives.
IPRE	The organization's major IT projects have realistic and achievable resource estimates.
IPSE	The organization's major IT projects have realistic and achievable scope estimates.
IPSP	The organization's major IT projects have realistic and effective staffing plans.
IPAT	The organization's major IT projects have realistic and achievable timelines.
IPCP	The organization's major IT projects have explicit communication plans.
	Implementation Problems in IT Projects (PROB)
DIPC	The organization has often experienced difficulty implementing major IT projects because of crises that distracted attention away from implementation.
DIUR	The organization has often experienced difficulty implementing major IT projects because of unclear delineation of responsibilities and authorities.
DIUS	The organization has often experienced difficulty implementing major IT projects because of unclear statement of overall goals and poor profiling of clients' needs.
DIIT	The organization has often experienced difficulty implementing major IT projects because implementation required more time than planned.
DILC	The organization has often experienced difficulty implementing major IT projects because of a lack of clear communication among stakeholders.
	Organizational Performance And Effectiveness (MPE)
IIMS	Information technologies have an impact on Member States and staff members' satisfaction.
ITLI	Information technologies have facilitated learning and innovation in your organization.
ITIP	Information technologies have contributed to improving internal processes in your organization.
ITCC	Information technologies are used successfully to create new organizational culture and climate.