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Aligning Global Business Information with ERP Systems for Improved Performance

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Abstract

This paper is a discussion of research on the co-alignment of enterprise resource planning (ERP) systems capabilities and global business information requirements for improved performance. It is based on Structural Equation Modelling (SEM) analysis to establish that if these two constructs (ERP systems capabilities and global business information requirements) are co-aligned, improved global business performance is achieved. Research undertaken in this paper is based on a survey of global businesses that have implemented ERP systems. It extends the extant IT/IS alignment theories to ERP/Global business information requirements alignment. It makes an important contribution to the global business management information literature, by identifying and validating a set of important global business information requirements. This research also makes a novel contribution to the ERP systems literature by establishing a set of ERP systems capabilities that are useful for managing global business information requirements.

Keywords

Global business information requirements, ERP systems capabilities, co-alignment, improved global business performance.

INTRODUCTION

Global business has become an important business trend dominating the world's trade and investments in the present era (Gunter and Andrea, 2009). Every day over US\$15 trillion worth of goods and US\$3.7 trillion worth of services are exchanged across national borders (Hill, 2011). The number of organisations that operate on a global scale is obviously on the rise, seeking profitable growth opportunities in the global arena (Aberdeen, 2007). Many reasons, including competitive advantage (Pangarkar and Yuan, 2009), profitable business opportunities (Aberdeen, 2007), increased demand for goods and services (Harrison, 2010), decline in cross border trade barriers (Hill, 2011), formation of global and multi-national strategic alliances (Koren, 2010) and rapid development in information and communications technologies (Hill, 2011) have largely contributed to this unprecedented growth.

To support global business operations, global organisations have invested heavily on ERP systems (Koumpis and Protogeris, 2010). However, are ERP systems capabilities aligned to global business information requirements and whether global businesses can achieve improved performance with ERP systems is not known? Even though a considerable number of academic studies on ERP systems and the alignment of IT/IS to business have been undertaken (McLaren et al., 2011), to date alignment of ERP systems to global business information requirements for improved performance remains a gap in the extant literature.

This paper therefore fills the void by investigating if global businesses achieve improved business performance by aligning their information requirements with ERP systems capabilities. The paper includes a discussion of global business and global business information requirements identified from literature, followed by ERP systems capabilities identified from the extant ERP literature. The ERP systems capabilities are then mapped to global business information requirements to propose an alignment model for improved performance. It then discusses the importance of aligning ERP systems capabilities with global business information requirements, from which a number of hypotheses are derived. Next, we present a research model to achieve improved business performance by co-aligning global business information requirements with ERP systems capabilities. It then describes the research methodology and data analysis. Finally, a discussion of the findings and their implications are included, followed by a conclusion and future research directions.

GLOBAL BUSINESS

A global business is defined as a business that has multinational operations and exchange finished goods, raw materials, services, information, knowledge, skills and capital across national boundaries (Hill, 2009). Kumar et

al., (2008) describe global businesses as a network of interconnected organizations working together in the global arena. Its unit of analysis is the world, and business strategies are focused on exploiting global business opportunities (Susan and Steven John, 2001). These organizations establish business activities in a number of countries for competitive advantage generally achieved from low cost labour and capital, and to take advantage of unique resources (Spulber and Daniel, 2007).

Growth of trade in goods and services, cross border investments and the organisation of production and service networks in the global arena is consistently increasing (Guy, 2009). The impact of globalization is ubiquitous and organizations of all sizes from many different industries are increasingly exploiting global opportunities (Carter, 2010), made possible by information and communication technologies, the Internet and the World Wide Web (Subramoniam et al., 2009). Types of industries that have global operations mainly include manufacturing, agriculture, education, mining, energy, banking, marketing, insurance, information technology, transport, healthcare, accounting and taxation (Hill, 2011). Managing global business operations is complex, expensive, challenging (Carter, 2010), and somewhat different from managing a traditional business, due to the complexity created by national, cultural, organizational and technical differences in different countries (Sannarnes, 2010). Global business information requirements that are indispensable in managing global business operations are discussed in the next section.

GLOBAL BUSINESS INFORMATION REQUIREMENTS

Global businesses have unique information requirements (Ghosh, 2002) due to integrated business activities in geographically dispersed units (Buckley and Casson, 2009), the need for sourcing up to date consolidated information from numerous business processes (PricewaterhouseCoopers, 2010), operating in different time zones (Yap, 2005) and global supply chains (Koren, 2010). Information sourcing from global operations entail dealing with different cultures (Bidgoli, 2010), strategic alliances and partnerships with global stakeholders (Arunatileka et al., 2009), managing diversity (Parker, 2005) and dealing with multiple currencies, accounting standards, reporting guidelines, and compliance regulations (SAP AG, 2009). Information requirements for global operations are discussed in the next section.

Multi-level and multi-purpose information from global units

As discussed above, global business activities are generally spread in a number of countries. Managers of global organisations usually operate from different countries (Bartlett and Ghoshal, 2003), who need real time information to make effective business decisions (Chhai and Lan, 2005). Integrated as well as disparate information covering all business activities of global business units are required for effective management of these organisations (Power and Sharda, 2009). Also, top, middle and operational management, data entry staff, shop floor workers, production units, warehouse staff and supply chain partners require different information from business units operating in different parts of the world (Chhai and Lan, 2005).

In global organisations, information is generally processed and maintained in business units in various countries or in a centralized database (Chhai and Lan, 2005). For instance, production related data can be processed and maintained in a manufacturing plant in China, accounting related data in India, inventory data in another country and sales data in many countries. Types of information required can vary from country specific legal, tax and reporting requirements (Kumar et al., 2008) to inventory, production and delivery records (SAP AG, 2004).

Accurate, timely and consolidated information

Accurate, timely and consolidated information is imperative for effective decisions in global organisations (Bidgoli, 2010). Accurate and timely information on global production, profitability, sales and marketing, human resources, inventory, shares, debtors, creditors, expenditure and political issues are essential for effective management of global business operations (SAP AG, 2004). This information help make better, faster and more informed business decisions (Bouquet et al., 2009) and enables better coordination, collaboration and control among strategic business units (SBUs) (Peppard, 1999). Furthermore, to serve effectively in each region, SBUs of global organisations need accurate and timely information on changes in demand and other related information in their region (Koren, 2010). Moreover, free flow of accurate information within (subsidiaries and departments) and beyond the organisational business units (major customers and suppliers) is imperative to leverage organisational potential in global businesses (ICMR, 2005).

Consolidated information from the widespread global business units is also an important requirement for managerial decision making (Ghosh, 2003). In global businesses, consolidated reports from all business units are required for the management of production levels, inventory management, sales and marketing strategies, human resource management, expenditure, profitability, tax, assets, liabilities and cash flow management of the group

(Hill, 2011). Furthermore, information consolidated from all business processes enable demand management as well as support quick decisions (Sannarnes, 2010).

Global business process information

Business processes (inventory, human resources, procurement, production, marketing and finance) of global businesses are usually dispersed in many different countries in the world. A strong coordination, collaboration and integration of all business processes supporting global operations is required to achieve business success and competitive advantage (Koren, 2010). In the global business environment, a firm's competitive position in one country is significantly influenced by its position in other countries (Boudreau et al., 1998). It can be achieved through effective coordination and collaboration of geographically distributed business processes. Thus, global organisations need to integrate their business processes on a global basis to achieve competitive advantage (Boudreau et al., 1998). Furthermore, integrated information from global business processes play an important role in leveraging strategic resources for a competitive advantage (Shi et al., 2010). Effective coordination and collaboration of information from all global business processes is critical for partner relationship management and improved business performance (Shi et al., 2010).

Global supply chain information

Global businesses have a large number of collaborators and stakeholders in the supply chain for sourcing as well as for distribution of goods and services (McAdam and McCormack, 2001). All supply chain members require a smooth flow of information for timely supply of raw materials, finished goods and services (Koren, 2010). It is important for global businesses to share relevant information with all stakeholders, including suppliers, customers, contractors, distributors, retailers, government organisations, capital markets, financial institutions (McAdam and McCormack, 2001) and consumers (Hill, 2011). Management of supply chain in global businesses is more complex and risky than that of local supply chains, due to the possibility of offshore delays (Koren, 2010). Global organisations have a much larger and multiple supply chains dispersed over many different countries in the world (Su and Yang, 2010). Thus, it is crucial for global organisations to have electronic, real-time and accurate supply chain information.

Secure information

Secure information is a very important requirement for all global operations (Kajava et al., 2006). Global businesses transfer critical business information to and from their business partners including suppliers, contractors, government organisations and customers electronically (Shew et al., 2003). Therefore, security of information is important to protect data from unauthorised access (Solms and Hertenberger, 2005), and information being intercepted or systems being hacked. These vulnerabilities are high when organizations are interconnected and data is in electronic form (Laudon and Laudon, 2010). In global businesses, ERP systems link with many different business partners around the world (Shew et al., 2003). Global businesses also transfer critical business information among their business partners electronically via ERP systems. Therefore, security in ERP systems is critically important to protect data from unauthorised access (Solms and Hertenberger, 2005), particularly in global businesses where data is transferred electronically (Laudon and Laudon, 2010).

Information security is therefore a significant challenge for global organisations (Kumar et al., 2008). As organizations become more and more interconnected and electronically linked to larger supply chains, a lack of information security in one organization will risk all organizations in the value chain (Luftman and Kempaiah, 2008). Thus, for global organisations secure information management with a stringent security policy, disaster recovery plan, business continuity plan and up to date security management tools (firewalls, antivirus software, data encryption and public key infrastructure) is an essential requirement (Laudon and Laudon, 2010).

From the above literature review it is clear that multi-level and multi-purpose information from global business units; accurate, timely and consolidated information; global business process information, global supply chain information and secure information are essential requirements of global businesses. Even though information requirements of all businesses are pretty much the same, global operations have an added level of complexity due to the large number of entities operating in different time zones and the need for secure information transmission from business units operating in different regions of the world. The complex information requirements of global business operations are increasingly managed by ERP systems (Koumpis and Protogeros, 2010) due to their capabilities of multi modular support and ERP being a large system. In the next section we discuss the ERP capabilities suitable for managing global business information needs.

ERP SYSTEMS CAPABILITIES

An ERP system is a type of information system (IS) (Sammon and Adam, 2010) that includes a large number of modules supporting a suite of business operations. Since ERP systems are multi module software packages, they easily integrate cross-organizational information (Sharif et al., 2005) and support a seamless flow of information between various business functions (Subramoniam et al., 2009). These systems are capable of providing accurate and timely information (Subramoniam et al., 2009), integrating business processes, (McGaughey and Gunasekaran, 2009), managing information flows, reporting and business analysis within and between organizational business units (Seddon et al., 2010). Capabilities of ERP systems that can support the information requirements of global businesses are discussed in the following section.

Support multi-purpose and multi-level information needs

ERP systems support a variety of business operations (Sammon and Adam, 2010), especially in large businesses (Davenport, 2000). The modules of ERP systems are designed to support business applications such as production management (Esteves and Pastor, 2001), maintenance of plant and equipment (Rashid et al., 2002), transportation management (Rashid et al., 2002), resource, manufacturing and quality management (El Amrani et al., 2006), access controls (SAP AG, 2007), human resources management, procurement of raw materials, management reporting (Davenport, 2000), accounting and financial management (Chang et al., 2008). ERP systems also support project management, advanced planning and scheduling, e-commerce, m-commerce and sales force management (McGaughey and Gunasekaran, 2009), investment management, collaborative commerce, business intelligence, knowledge management (Subramoniam et al., 2009), customer relationship management, supply chain management and data warehousing (Seddon et al., 2010). Furthermore, ERP systems can deliver multi-purpose information needs of employees at different organisational levels including top management, middle management, operational management, data entry staff, shop floor workers, production units, warehouse staff and supply chain partners (Kumar et al., 2008). These modules put together cover a whole business, addressing multi-purpose and multi-level information needs of large organisations.

Deliver accurate, timely and consolidated information

Accurate, timely and consolidated information are required for sound business decisions and supporting to achieve organisational objectives (Seddon et al., 2010). ERP systems are capable of providing accurate, timely and consolidated information allowing organisations to make effective operational, tactical and strategic decisions (Chand et al., 2005). The accuracy of information from ERP systems is very high compared to traditional legacy systems due to its reporting and analytical capabilities (Beheshti, 2006). Furthermore, if inaccurate data is discovered by ERP systems, it can be corrected from the source instead of going through each department for every change (Beheshti, 2006). ERP systems are also capable of delivering information to a large number of users simultaneously, who are able to identify discrepancies if any (Staeher, 2010). Accurate, timely and consolidated information enabled by ERP systems deliver improved information visibility, better management decisions, improved business processes, cycle time reduction and faster financial close cycle (Seddon, 2005).

Integrated global business process information

ERP systems facilitate transaction processing (Beard and Sumner, 2004), business process integration (Gunter and Andrea, 2009), operate on a web enabled architecture (Siau, 2004), integrate multi enterprise operations (Sane, 2005), provide real time data and information, incorporate different legal and tax reporting policies, support multi languages and multi currencies as well as intra and inter organisational communication (Subramoniam et al., 2009). ERP systems integrate various business processes and provide the right information to the right people at the right time for sound business decisions (McGaughey and Gunasekaran, 2009). They are used by manufacturing, retail and service organisations (Moon, 2007), supporting faster transfer of transaction information (Kamhawi, 2009), better financial management (Esteves, 2009) and business reporting (Subramoniam et al., 2009). These systems can also be used to support performance measurement and strategic planning (BPP Learning Media, 2009).

Manage global supply chain information

ERP systems successfully support supply chains (Mabert et al., 2003; Beheshti, 2006) and have the capability to integrate information from a large number of supply chain partners (Chen and Chou, 2009). These systems have become an integral part of supply chain management in many organisations (Su and Yang, 2010), facilitating end to end process of supply management (Ross and Vitale, 2000). With the help of ERP systems, supply chain partners are able to coordinate their business activities and track items for timely supplies (Beheshti, 2006). With integrated supply chain information (Nandi and Nayak, 2009), ERP systems also support partner relationship

management. Sharing a large volume of real-time information between supply chain partners is a unique ERP capability essential for global business operations (Su and Yang, 2010).

Manage secure information

ERP systems can provide fine-grained security controls in all environments for data transmission (Smets-Solanes and De Carvalho, 2003). ERP systems allow authentication and authorisation for network and communication. They also support data storage, data encryption, control third party access, manage trace and audit logs and digital security (SAP AG, 2006). ERP systems also support backup, continuity planning, disaster recovery and automatic updating (Linying et al., 2009; Malhotra and Temponi, 2010). Furthermore, ERP systems have a role-based control mechanism where restrictions can be imposed on user transactions, ensuring more control over system security and minimising fraud risks (Khan et al., 2009).

To establish the link between global business information requirements and the ERP systems capabilities, the issues identified above are summarised in table 1.

Table 1. Global Business Information Requirements and ERP Systems Capabilities

Global Business Information Requirements	Literature Source	ERP Systems Capabilities	Literature Source
Multi-level information (MLIN)	Grant, 2003; Chhai and Lan, 2005; Power and Sharda, 2009	Support multi-level information (SMLIN)	Sane, 2005; McGaughey and Gunasekaran, 2009; Subramoniam et al., 2009; Seddon et al., 2010
Multi-purpose information (MPIN)	Grant, 2003; Kumar et al., 2008; Power and Sharda, 2009; SAP AG, 2009	Support multi-purpose information (SMPIN)	Siau, 2004, McGaughey and Gunasekaran, 2009; Subramoniam et al., 2009; Seddon et al., 2011
Accurate and timely information (ATIN)	Peppard, 1999; Ghosh, 2003; Hawking, 2008; Mishra, 2009; SAP AG, 2009; Koren, 2010; Hill, 2011	Deliver accurate and timely information (DATIN)	Sharif et al., 2005; Chand et al., 2005; Beheshti, 2006; Seddon et al., 2010
Consolidated information (CIN)	SAP AG, 2004; Mishra, 2009; Hill, 2011	Deliver consolidate information from different units and processes (DCIN)	Seddon, 2005; BPP Learning Media, 2009b; Seddon et al., 2010
Global business process information (GBPIN)	Peppard, 1999; Koren, 2010; Samnanes, 2010	Integrated global business process information (IGBPIN)	Sane, 2005; Gunter and Andrea, 2009; Seddon et al., 2010
Global supply chain information (GSCIN)	kimble, 2011; Friedman, 2006; Koren, 2010; Turban et al., 2010; Hill, 2011	Manage global supply chain information (MGSCIN)	Shew et al., 2003; Mabert et al., 2003; Beheshti, 2006
Secure information (SIN)	Kajava et al., 2006; Luftman and Kempaiah, 2008; Hitachi Consulting, 2009; Laudon and Laudon, 2010	Manage secure information (MSIN)	Smets-Solanes and De Carvalho, 2003; Solms and Hertenberger, 2005; Laudon and Laudon, 2010

Literature analysis presented in table 1 includes a list of global business information requirements and ERP systems capabilities. Earlier studies on alignment of IT/IS to business (Chan et al., 1997; Sabherwal and Chan, 2001; Croteau and Raymond, 2004; Anthony Byrd et al., 2006; Chan et al., 2006; Dong et al., 2008) indicate that if IT/IS is aligned to businesses, improved performance outcomes are achieved. Based on these studies, we assume that if ERP systems are aligned to global business information requirements, improved global business outcomes will be achieved.

Business-IT/IS alignment, as described by Reich and Benbasat (1996, p. 56) is “the degree to which the information technology mission, objectives, and plans support and are supported by the business mission, objectives, and plans”. A considerable number of studies have been undertaken on alignment of IT/IS to business in the extant literature. However, the focus of earlier alignment studies are on aligning information technology and business (Henderson and Venkatraman, 1993), business strategy and IT/IS strategy (Sabherwal and Chan, 2001), alignment maturity (Luftman et al., 2008), social dimension of alignment (Reich and Benbasat, 2000) and enablers and inhibitors of alignment (Luftman and Brier, 1999). Alignment of ERP systems to global business information requirements has not yet been explored.

Business IT alignment according to Henderson and Venkatraman, (1991) can be achieved by establishing harmony between four domains of strategic choice: business strategy, information technology strategy, organizational infrastructure and processes and information technology infrastructure and processes. Chan and Huff, (1993), further elaborated alignment of IS with business for improved IS effectiveness and business performance by linking IS strategy to business strategy. Co-alignment on the other hand refers to a match or internal consistency among a set of theoretically related dimensions such as research and development, design, manufacturing and marketing (Venkatraman, 1989), resources and strategies (Edelmana et al., 2005), strategy and external environment (Covin and Slevin, 1989), strategy and organizational characteristics (Edelmana et al., 2005), business and information systems plans (Yannis A, 2003), policies and procedures (Hsu et al., 2009), business and IT structures (Chan and Reich, 2007), organisational and technological infrastructures (Croteau and

Bergeron, 2001), strategic and IT competencies (Croteau and Raymond, 2004) and business practices and capabilities (Fabi et al., 2009).

Venkatraman, (1989) is of the view that the alignment/fit includes moderation, mediation, matching, gestalts, profile deviation, and co-variation/co-alignment. Since the fit between global business information requirements and ERP systems capabilities for improved global business performance has been identified above as a gap, Venkatraman' (1989) co-variation/co-alignment perspective of fit is an appropriate concept to establish the fit between global business information requirements and ERP systems capabilities for improved global business performance.

Improved business performance in earlier alignment studies referred to improvement in profitability, business growth (Tallon and Pinsonneault, 2011), innovation, reputation, customer and employee satisfaction (Chan et al., 1997), productivity, efficiency and effectiveness (Bergeron et al., 2004). Improvement in profitability is a financial measure contributing to improve organisational profits and shareholder value (Hu and Huang, 2006). It can be achieved through increased return on investments, sales and reduction in costs (Van der Zee and De Jong, 1999). Organisational reputation can be enhanced by increased customer satisfaction delivered through enhanced customer service (Bostan and Grosu, 2011). If customers are not happy, they will not come back, therefore, customer satisfaction is an important element in achieving organisational success (Horngren et al., 2012). Learning and growth are achieved from innovative products and services and improved employee satisfaction (Huang and Hu, 2004). Improvement in quality, productivity, efficiency and effectiveness are outcomes of organisational internal business process improvement (Hu and Huang, 2006).

From the above it is clear that the performance measures used in the earlier alignment studies can be categorised as financial, customer, learning and growth and internal business process performance. This categorisation is similar to the four perspectives of balance scorecard introduced by Kaplan and Norton, (1998).

Research hypotheses

Based on the literature review above, the following hypotheses have been derived.

- H₁- The co-alignment between global business information requirements and ERP system capabilities positively influence financial performance of global businesses.
- H₂- The co-alignment between global business information requirements and ERP system capabilities positively influence customer performance of global businesses.
- H₃- The co-alignment between global business information requirements and ERP system capabilities positively influence learning and growth performance of global businesses.
- H₄- The co-alignment between global business information requirements and ERP system capabilities positively influence internal business process performance of global businesses.

While a number of hypotheses have been generated from the literature on global business information requirements and ERP systems capabilities affecting performance, other variables that will moderate performance are organisation size (Batenburg and Constantiou, 2009) and the history of globalisation (Kim and Oh, 2000). Organisation size is generally determined by number of employees, sales volume and total assets (Carpenter and Fredrickson, 2001). Globalisation history refers to the number of years a business been operating in the global market (Kim and Oh, 2000). The above discussion indicates that organization size and globalization history have an effect on global business performance. Therefore, it is hypothesised that:

H_{5A/B/C/D}- Financial, customer, learning and growth and internal business process performance of global businesses is moderated by organisation size.

H_{6A/B/C/D}- Financial, customer, learning and growth and internal business process performance of global businesses is moderated by globalisation history.

Proposed research model drawn from the above hypotheses are presented in the following section.

Proposed research model

Based on the six hypotheses formulated from the above literature review, the following research model is established.

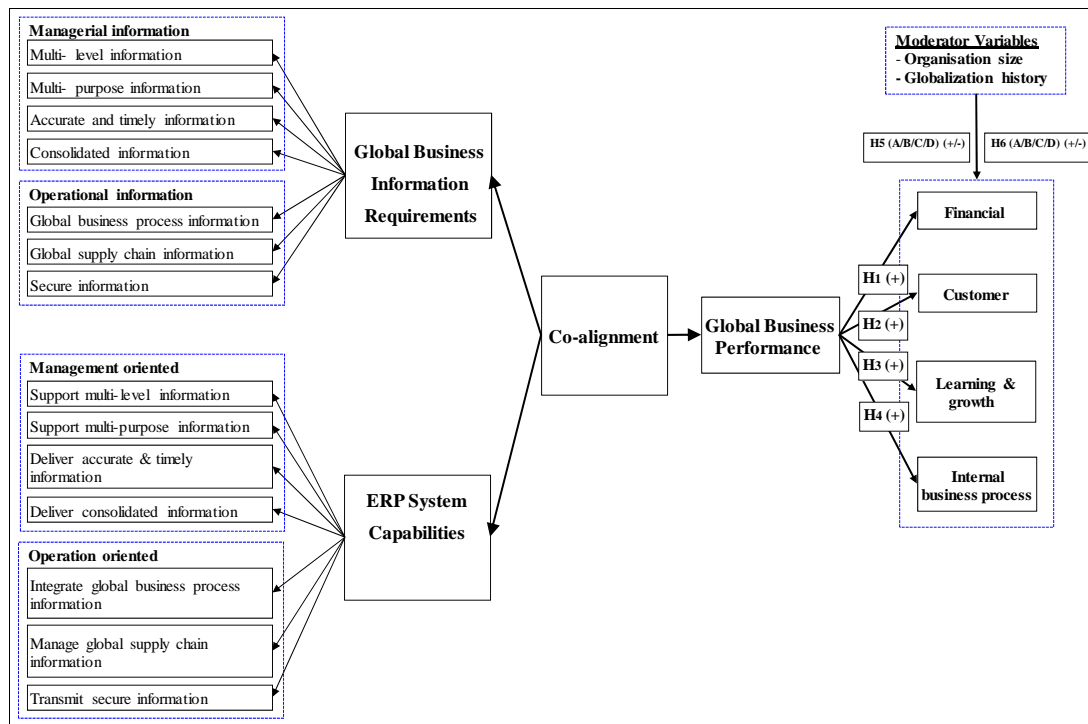


Figure 1: Proposed Research Model

Figure 1 shows that the proposed research model has three main constructs: global business information requirement, ERP system capabilities and global business performance improvements. It predicts that if ERP systems capabilities are aligned to global business information requirements, improved global business performance outcomes (financial, customer, learning and growth and internal business process) can be achieved.

RESEARCH METHODOLOGY

Since the focus of this study is global business, which are located in many different countries, a large scale online survey was carried out to collect data. Data was collected using the “survey monkey” web based survey tool. The survey monkey enabled data gathering electronically, which was essential for this research. Preliminary discussions with global business managers revealed that the majority of them preferred online surveys than postal questionnaire surveys.

Prior to the survey a pilot study was carried out with 5 PHD students, 7 academics and 2 ERP professionals to establish their understanding of the questions, to estimate the time required to fill in the online questionnaire and to test the accuracy of the data record stored in the survey monkey database. The sample for this research was chosen using purposive and self-selection sampling methods, in which respondents were selected based on their experience in using ERP systems in a global business background (Kim et al., 2011; Polonsky and Waller, 2011). After a careful consideration, a sample of 700 managers was selected from internet directories, company websites and personal contacts.

A total of 217 responses were received within 3 months with a couple of reminders. However, only 196 responses were usable for data analysis, giving a response rate of 29.3%. Structural equation modelling (SEM) technique was used to analyse data as it involves testing of multiple relationships of dependent and independent variables (Hair et al., 2010). The statistical software IBM SPSS AMOS version 19 was used for the SEM analysis.

DATA ANALYSIS AND FINDINGS

The proposed research model involves a testing of multiple relationships of dependent and independent variables. As recommended by Byrne (2010) and Hair et al. (2010) proposed model was developed in two phases. First, measurement models of three main constructs, global business information requirement (GBIR), ERP system capabilities (ERPSC) and global business performance (GBPER) were developed and validated. Confirmatory factor analysis (CFA) approach was used to validate the measurement models. Next, the structural model (co-alignment model) was developed and validated.

Validation of the co-alignment model

The co-alignment model adopts Venkatraman’s (1989) perspective of fit as co-alignment/co-variation. This is the structural model which represents the conceptual relationship among constructs. Theoretical relationship of the co-alignment model was drawn from previous studies on IT/IS-business alignment, ERP systems, global business and business performance. The co-alignment among factors is considered to be an unobservable theoretical construct on a higher plane than individual functional dimensions (Venkatraman, 1989). There are no directly observable indicators for this construct and consequently, co-alignment is derived through a third order reflective construct. This is derived from two second order constructs, namely global business information requirements and ERP systems capabilities, as suggested by Venkatraman (1989, 1990) and Croteau and Raymond (2004).

Diamantopoulos (2011) argued that choosing the measurement perspective whether reflective or formative should be driven by a theory. As suggested by theory (covariation perspective of fit) main constructs, GBIR, ERPSC and GBPER, in this research were formulated as reflective and the relationship between co-alignment and business performance was formulated as a formative one (Venkatraman, 1990; Croteau and Raymond, 2004). Figure 2 depicts the co-alignment model and its statistical results.

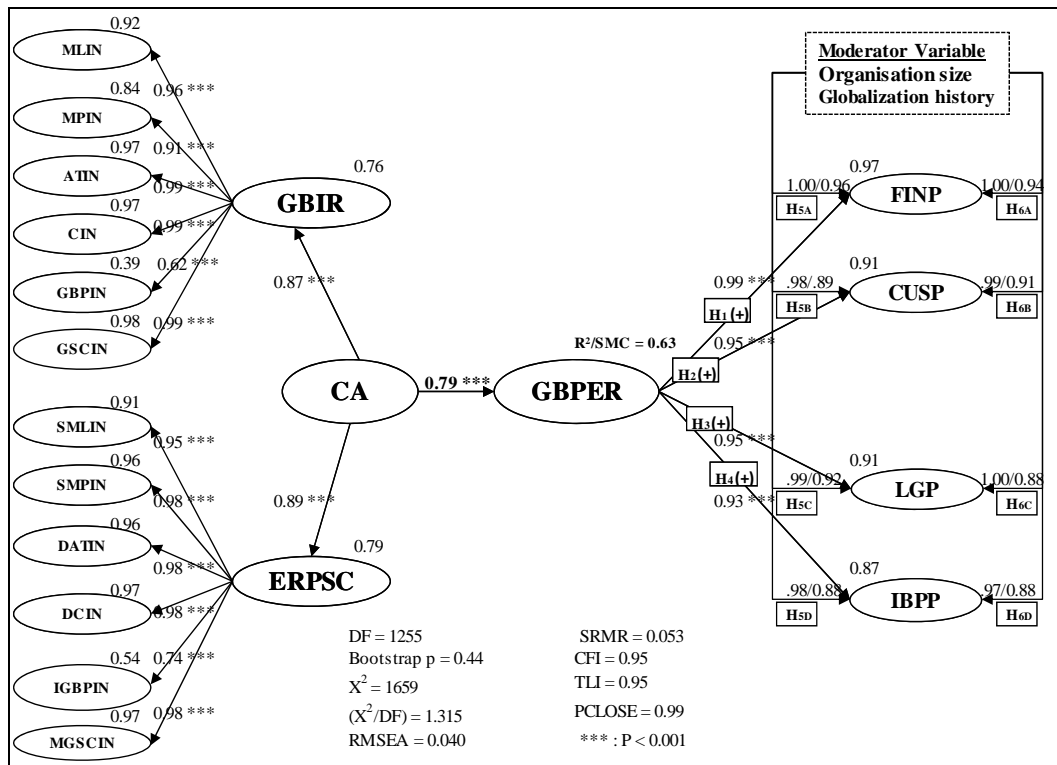


Figure 2: Co-alignment model

Figure 2 shows the co-alignment effect that global business information requirements and ERP systems capabilities have on global business performance. The co-alignment model achieves an acceptable fit with a chi-square of 1,650, 1255 DF and a p-value of 0.44 (Hair et al., 2010). Normed chi-square (1.32) is within the accepted range between 1 and 2. RMSEA (0.04) is well below the recommended threshold of 0.08. SRMR (0.05) is well below the recommended threshold of 0.09. CFI (0.95) and TLI (0.95) are well above the recommended threshold of 0.92. PCLOSE (0.99) is well above the recommended value of 0.05 (Hair et al., 2010).

The co-alignment model explains that 63% (SMC/R2) of the global business performance outcomes resulted from the alignment of global business information requirements and ERP systems capabilities. Standardised factor loadings (SFLs) of all the observed variables of GBIR, ERPSC and GBPER constructs (0.91 to 0.99) are approximately the same except IGBPIN (0.74) and GBPIN (0.62) variables. These results indicate that they are parallel measures for GBIR, ERPSC and GBPER constructs (Holmes-Smith, 2011). Furthermore, squared multiple correlations (SMCs) of all the indicator variables of all three constructs are greater than or closer to 0.9, except GBPIN variable (0.39) of GBIR construct and IGBPIN variable (0.54) of ERPSC construct. This indicates that all three latent constructs, GBIR, ERPSC and GBPER account for about 90% of the variance in each of the indicators and they are good measures of those constructs (Holmes-Smith, 2011).

Hypotheses validation

This section discusses the results of hypotheses validation. Table 2 shows the path coefficient, p-values and the outcome of the hypotheses testing.

Table 2. Results of hypotheses testing

Hypothesis		Path coefficient		P	Results
H ₁	The co-alignment between global business information requirements and ERP system capabilities positively influence financial performance of global businesses	0.99		***	Supported
H ₂	The co-alignment between global business information requirements and ERP system capabilities positively influence customer performance of global businesses	0.94		***	Supported
H ₃	The co-alignment between global business information requirements and ERP system capabilities positively influence learning and growth performance of global businesses	0.93		***	Supported
H ₄	The co-alignment between global business information requirements and ERP system capabilities positively influence internal business process performance of global businesses	0.96		***	Supported
The effect of moderators - Large vs small organisations		Large	Medium		
H _{5A}	Financial performance of global businesses is moderated by organisation size	1.00	0.96	***	Supported
H _{5B}	Customer performance of global businesses is moderated by organisation size	0.98	0.89	***	Supported
H _{5C}	Learning & growth performance of global businesses is moderated by organisation size	0.99	0.92	***	Supported
H _{5D}	Internal business process performance of global businesses is moderated by organisation size	0.98	0.88	***	Supported
The effect of moderators - Established vs new organisations		Estb:	New		
H _{6A}	Financial performance of global businesses is moderated by globalization history	1.00	0.94	***	Supported
H _{6B}	Customer performance of global businesses is moderated by globalization history	0.99	0.91	***	Supported
H _{6C}	Learning & growth performance of global businesses is moderated by globalization history	1.00	0.88	***	Supported
H _{6D}	Internal business process performance of global businesses is moderated by globalization history	0.97	0.88	***	Supported

Note : *** p < 0.001 (two-tailed)

Four out of six hypotheses were supported with a 99% confidence level and they are heading in the same direction as hypothesised. Results confirmed that the co-alignment between global business information requirements and ERP systems capabilities highly and positively influence the financial performance (H1), customer performance (H2), learning and growth performance (H3) and internal business process performance (H4) of global organisations. Hypotheses related to the moderator variables of organisation size and globalisation history are supported indicating that the organisation size and globalisation history moderates the relationship between co-alignment and financial performance (H5A/6A), customer performance (H5B/6B), learning and growth performance (H5C/6C) and internal business process performance (H5D/6D) of global organisations.

CONCLUSION AND FUTURE RESEARCH

This research developed and empirically tested the co-alignment of ERP systems capabilities to global business information requirements for improved global business performance. It is one of the few studies that empirically investigated how “fit” as co-alignment lead to improved business performance. The findings of this research supported for the conceptualisation of fit as co-alignment/co-variation, confirming that the co-alignment of global business information requirements and ERP systems capabilities leads to improved global business performance. The findings established that global organisations have unique information requirements and ERP systems can support their information requirements. Furthermore the findings provide strong evidence that co-aligning global business information requirements with ERP systems capabilities has a positive impact on the financial, customer, learning and growth and internal business process performance of global organisations, moderated by organisation size and globalisation history.

The limitations of this study include a relatively small sample size and the majority of respondents being manufacturing and retail global businesses from one region, the Asia Pacific. Hence, testing the variables and the

model in other regions of the world would be a further research opportunity. A longitudinal study to establish the changes in performance overtime is also a further research issue.

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