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## Enterprise resource planning system business process attributes: A research note

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### Abstract

IT systems, particularly enterprise resource planning (ERP) systems, have been considered to be the necessary carriers of information and the most significant driver of competitive advantage. In the past twenty years, ERP systems have become more and more popular for all firms. This study tries to discuss the concept of ERP business process in brief. It clarifies ERP system business process attributes for better assessment of the system. A wide-ranging review is used of preceding literature on ERP systems. These attributes as the prospective pointer of ERP systems implementation are proposed next. The study provides new understandings of ERP system by means of four attributes –integration business process, standardization business process, routinization business process and centralization business process - to better comprehend the impact and function of ERP system.

**Keywords:** Centralization, standardization, integration, ERP system business process, Routinization

### 1. Introduction

At the dawn of globalization, companies are struggling to maximize their wealth through optimal use of business' resources and appropriate measurements of planning and monitoring. So as to administer processes in these businesses, there is a need for an Integrated Information System (IIS) that capture all information and also handles and organizes all resources. It has been a common tendency amongst companies to invest on ERP systems since more and more establishments all over the world are implementing these systems (Kallunki *et al.*, 2011) <sup>[12]</sup>. ERP system is considered as an instrument to assist businesses in launching their competitive edge. It contains a single database that integrates business processes and facilitates the flow of information in all business (Wier *et al.*, 2007; Sanchez & Spraakman, 2012) <sup>[35, 27]</sup>. For Kanellou and Spathis (2013) <sup>[13]</sup>, it is the first technology that combines information technology (IT) concepts and accounting functions. Granlund (2011) <sup>[8]</sup> asserts the impact of IT, ERP systems in particular, on management and accounting. Despite the fact that there is an increase in studies in the field, it has not been studied sufficiently. Much of research could not clarify the relationship between ERP systems and business (Granlund 2011) <sup>[8]</sup>. However, management and accounting researchers have recently analyzed the issues relating to ERP and its impact on business (Booth *et al.*, 2000; Caglio, 2003; Spathis & Ananiadis, 2005; Spathis, 2006; Rom & Rohde, 2006; Kallunki *et al.*, 2011; Ruivo *et al.*, 2014) <sup>[2, 3, 32, 31, 24, 12, 25]</sup>. In accounting, the discussion has mainly focused on inspecting the advantages of implementing ERP on firm's performance without comprehending the real benefits of ERP systems. With regard to the current literature, studies on ERP from a business perspective are not fully shaped (Sutton, 2006; Granlund, 2007; Sanchez & Spraakman, 2012; Ruivo *et al.*, 2014) <sup>[33, 7, 27, 25]</sup>. There are unreliable findings that are mostly built on case studies which limits the generalizability of the information. Therefore, earlier scholarships on ERP systems (accounting studies) couldn't measure and assess ERP systems fully by investigating its business process which is made of - physical activities, the processing of transactions, and the provision of information (Magal & Word, 2009; Sanchez & Spraakman, 2012) <sup>[16, 27]</sup>. They only examined ERP systems using its informational flow/outcome.

This article begins with a brief discussion of the concept of ERP business process. Secondly, the properties of ERP business process are presented in parallel with a review of literature

from IT perspective. These properties, as the potential indicators of ERP adoption, are proposed afterwards. In the last section, research note is summarized and concluded.

## 2. ERP Business Process and Attributes

Taking into consideration the complication of handling data within a whole business process, it is irrational to depend on manually functional Information Systems (IS) by reentering the data from system to another. Hence, to move from silos to automated process, establishments should also change from functionally focused information system to integrated enterprise systems such as ERP systems. Enterprise systems support the whole process, not parts of it, and reduce tasks' interdependence, roles, number of staff, departments and functions. The challenge lies in avoiding confusion between ERP business process, functions, people, roles, tasks, departments and providing clients with a service or product in an all-inclusive mode (Earl, 1994; Magal & Word, 2009) [6, 16].

Therefore, ERP plays an important role in assisting business procedures by carrying vital business process information and make changes for business activities later (Granlund, 2007; Rom and Rohde, 2006) [7, 24]. In view of the fact that ERP are strongly linked to business process, business process is considered as a collection of interconnected work activities providing output of greater value than the inputs through one or more transformation (Melan, 1998; Magal and Word, 2009) [18, 16]. They categorize transformations as physical, transactional and informational flows. The definition will be elaborated in the succeeding argument.

The boundary between information flow and management decision business is essential for success. Therefore, it is indispensable for firms to be capable of evaluating the efficiency in achieving business anticipations (Nicolaou & Bhattacharya, 2008; Kanellou & Spathis, 2013) [19, 13]. Despite the important number of establishments implementing the technology, experimental inquiry, however, provided unreliable support for ERP implementation and business performance relationship (Granlund, 2011) [8]. Sánchez and Spraakman (2012) [27] proposed that insufficient valuation of ERP business process characteristic is a likely reason for the discrepancy. By the same token, other scholars (Booth *et al.*, 2000; Shehab *et al.*, 2004; Kallunki *et al.*, 2011) [2, 30, 12] think that imperfect experience on ERP role in business process delays the understanding of the effects on management control and business's achievement.

With regards to the slight number, Sánchez and Spraakman (2012) [27] conducted investigative case studies aiming to comprehend the effect of ERP systems on management accounting and control. The study detected how ERP might cause: (a) the enhanced computing power and total standardization more correct and well-timed information; (b) The standardized transaction processing improved the accessibility of information from parts and products, and guaranteed a steadiness of information through all parts and products; (c) The standardization and automation of transaction processing have decreased the amount of data entry completed by management accountant. They emphasized the necessity of comprehending diverse flows of ERP systems, specifically, physical, transactional and informational. This three-flow is an ERP business process notion was presented by Magal and Word (2009) [16]. Sánchez and Spraakman (2012) [27] explained that by

investigating these levels, the role and effect of ERP could be better understood.

Scapen and Jazayeri (2003) [28] conducted a longitudinal case study in the European partition of a huge US multinational to inspect the effect of ERP system on management accounting changes. Fundamental changes had been detected in the essence of the management accounting information. Nonetheless, the scholars emphasized the significant characteristic to ease management accounting and control change by ERP implementation. Four characteristics of ERP process were recognized, specifically, standardization, integration, routinization and centralization. Each characteristic is defined as:

- a. *Standardization*: The SAP system employed, made in businesses, and enforced from the corporate HQs. Though business division is involved in the system design process.
- b. *Integration*: is an essential attribute of ERP systems. It suggests that all relevant data for a specific bounded and closed set of business processes is managed in the same software application.
- c. *Routinization*: Considerable routine accounting and other information processing undertakings are now carried out within SAP.
- d. *Centralization*: It is imperative to deliberate about both the centralization of systems, design and control, as well as the centralization of extra maintenance actions in deliberating centralization it (such as transactions processing and financial accounting).

Evidently Scapens and Jazayeri (2003) [28] conceptualization of ERP using four attributes has been cited and widely discussed in the area of management and accounting information systems (AIS). Yet, most studies attempt to examine each attribute separately. Considering very limited studies have attempted to observe all four attributes in a single study, the present study proposes the need to observe all four attributes simultaneously to provide comprehensive understanding of ERP business process. Next sections provide explanation on the assessment of each attribute.

### 2.1 Integration business process

Integration is considered to be one of the pertinent ERP attributes (Rom & Rohde, 2006) [24]. Nevertheless, IT literature concept of integration is frequently deliberated, the precise gist of the term continued to be blurred (Granlund, 2011) [8]. An information system business process could be incorporated with diverse magnitudes. Booth *et al.* (2000) [2] recognize three scopes of integration: data integration, hard/software integration and information integration. Data integration denotes the above-mentioned attribute of IIS that data are kept and preserved in one appropriate area only, while hardware/software integration denotes the network connectively in the processors that can interconnect mutually. Lastly, information integration refers to the smoothness information can be exchanged among all sections. Data integration and hardware/software integration denote technical characteristic of integration, whereas information integration denotes business characteristics. Booth *et al.* (2000) [2] underscore the fact that systems might not be greatly integrated without examining the effect of technical aspect and business aspect combined. In the meantime, Chapman and Kihn (2009) [4] measured integration system with regard to two objects that are

information in reports produced by IS (e.g. ERP), and fully-integrated information system which comprise financial and non-financial information together.

Contrarily, Berente *et al.* (2009)<sup>[1]</sup> used a case study in five administrations to theorize integration slightly dissimilar to other researches. The research defines integration business process with reference to accessibility of information to be utilized in business decision/process between undertakings. They precisely recognize integration of business process via the following principles:

- a) Accessibility indicates the capability of accessing information inside the process from each required point.
- b) Timeliness indicates the flow of the information conducted from one mission to another instantaneously.
- c) Transparency indicates the simplicity which enables information passed from one task to another to be understood.
- d) Granularity indicates the fact that all information exchanged in the process should be delivered with detail.

The model that discusses the component of integration implemented by Berete *et al.* (2009)<sup>[1]</sup> is like the integration element adopted in Scapens and Jazayeri's (2003)<sup>[28]</sup> model. This study will draw on Berente *et al.*<sup>[1]</sup> perception. Business process integration is to be reinforced by standardization, centralization and routinization ERP business process for improved ERP valuation and that will be deliberated in the next section.

## 2.2 Standardization Business Process

Standardization indicates ERP system employed in businesses' divisions or sections, made in companies, and forced from the company's HQs (Scapens & Jazayeri, 2003)<sup>[25]</sup>. Companies try to systematize processes for numerous significant motives. Inside a firm, standardization can simplify communications regarding business operations, assist easy transfer through process restrictions, and enable comparative measures of performance (Davenport, 2005)<sup>[5]</sup>. Many scholars think that standardized business processes are better to outsource and that there are experimental clues which indicates the fact that business process standardization decreases the risks of business process (Granlund & Malmi, 2002; Wullenweber *et al.*, 2008; Sánchez & Spraakman, 2012)<sup>[9, 27, 36]</sup>.

Many studies mentioned frequently standardization of data (Scapens & Jazayeri, 2003)<sup>[28]</sup>, yet, the concept is still unclear. Previously, Granlund and Malmi (2002)<sup>[9]</sup> stated that standardization provides easier and faster access to (standardized) operational data. Sánchez and Spraakman (2012)<sup>[27]</sup> contended that the most significant advantages of ERP standardization is that it improved computing power and general standardization direct to more exact and well-timed information. The standardized transaction processing have developed the availability of information from products and units previously lacking information, and guaranteed a constancy of information all the way through every part and product the standardization of transaction processing has reduced the quantity of data entry prepared by management accountants. Additionally, Caglio (2003)<sup>[3]</sup> stated that a progressive level of standardization of accounting activities and practices headed to the need for integration and inter-functional cooperation. Therefore, it is in agreement with this, this study proposes the need to

detect both standardization and integration of ERP characteristics. Consequently, the scholarships discussed before emphasized that ERP standardization have constructive effect on business process.

There is an encouraging influence of business process Standardization on business and organization products (Wullenweber *et al.*, 2008)<sup>[36]</sup>. They examine the degree of business process standardization utilizing:

- a) The activities of the process are transparent and comprehensible.
- b) Process can effortlessly be educated through documentation and exercises.
- c) The outsourced process is highly standardized.

Numerous academics (Ramakumar & Cooper, 2004; Swaminathan, 2001; Wullenweber *et al.*, 2008)<sup>[23, 34, 36]</sup> focused on business process standardization. Particularly, standardized processes will display improved performance. Furthermore, Business process standardization decreases the risks of business process outsourcing (Wullenweber & Weitzel, 2007; Wullenweber *et al.*, 2008)<sup>[37, 36]</sup>. Likewise, from the literature of production and supply chain, standardization of business process is intended to develop operational performance and lessen costs by reducing process inaccuracies and assisting communications (Manrodt & Vitasek, 2004; Phelps, 2006; Ramakumar & Cooper, 2004)<sup>[17, 21, 23]</sup>. Consequently, it appears to be stimulating to advance ERP systems standardization business process for improved ERP systems assessment to accomplish better effect of ERP systems on business performance.

Caglio (2003)<sup>[3]</sup> accentuated the fact that integration has to follow standardization. In the meantime, Scapens and Jazayeri defined integration and standardization as ERP attributes that required better-quality understanding of ERP systems. Bearing in mind literature, this study seeks to define standardization business process taking into consideration Wullenweber *et al.* (2008)<sup>[36]</sup> with regard to easier, faster, transparent and intelligible as part of standardization measurement.

## 2.3 Routinization business process

Routinization indicates the assumed routine accounting and further information processing actions by ERP system (Scapens & Jazayeri, 2003)<sup>[28]</sup>. Because of ERP systems are exceedingly adaptable, configurable, and flexible and having an incorporated design, a rise in routinization of ERP systems help business processes inside an institute to be widely and customarily reconfigured for substitute resources while simultaneously lessening the cost and period of switching these resources (Sanchez, 1995; Kharabe & Lyytinen, 2012)<sup>[26, 14]</sup>. For the meantime, Literature on routinization similarly proposes that knowledge sharing allowed by improved routinization of ERP systems might cause reduced administrative liveliness by supporting situations held by directors that are from what has succeeded previously and achieve ERP effective implementation (Kharabe & Lyytinen, 2012; Shao *et al.*, 2012)<sup>[14, 29]</sup>. Moreover, routinization, as a concept, was part of Scapens and Jazayeri (2003)<sup>[28]</sup> model. Nonetheless, few studies have empirically witnessed\ studied these characteristics. Therefore, routinization as one of ERP systems attributes needs to be deliberated so as to define the

system for comprehending the advantages of the systems completely.

Hage and Aiken (1969) <sup>[10]</sup> examined the association between organizational technologies, specially the amount of routine in work. They found that organization with repetitive tasks highlights objectives of competence and value of customer services. They inspected the routines by means of numerous questions. The first question reads: "Would you describe your work as being very routine, somewhat routine, somewhat non-routine, or very nonroutine?" This question, together with many others created by Hall (1963) <sup>[11]</sup> encumbered together in a factor analysis of different characteristics of organizational conduct and seems to illustrate a distinct and different measurement demonstrating work's routineness. Questions used by Hall:

- a) People here do the same job in the same way every day.
- b) One thing people like around here is the variety of work.
- c) Most jobs have something new happening every day.
- d) There is something different to do every day.

Lately, Kharabe and Lyytinen (2012) <sup>[14]</sup> investigated two dimensions of routinization, namely,

- a) *Diversity of routinization* was examined by assembling input on the use of functional units in operative, managing, and executive routines of the business unit.
- b) *Depth of routinization* was examined utilizing nine-item measure:
  - i. ERP system will offer forthcoming chances for cultivating how we conduct business.
  - ii. ERP system as offering further prospects for cultivating the unit's efficiency.
  - iii. ERP system not only as a change for long-standing systems but as a novel stage that has the potential to offer valued innovative aptitudes as well.
  - iv. Vigorously search for innovative methods of employing the ERP system to develop efficiency.
  - v. Reassure people to further discover and study the ERP system so as to find new ways of utilizing it.
  - vi. Dedicate means to discovering the ERP system to find different methods to control its power.
  - vii. Carry on discovering new techniques of making use of the ERP system to advance the manner we conduct business.
  - viii. Still finding new means of utilizing the ERP system to acquire business profits.
  - ix. ERP lasts to provide us with new prospects in order to develop our efficiency.

Consequently, this research provides the routinization measurements supported by other attributes that are provided for accomplishing the best ERP assessment.

#### 2.4 Centralization business process

In deliberating on centralization it is significant to take into consideration both the centralization of systems design and control, and the centralization of other support activities (Scapens & Jazayeri, 2003) <sup>[28]</sup>. Quattrone and Hopper (2005) <sup>[22]</sup> examined the impact of employing an ERP system on management control in two companies of international establishments. It emphasized the effect on business process is also ascribed to centralization structure of the data. It was done by concept-packaging centralization and standardization methods when obtaining new companies, and applying IT and control systems amid them.

Sánchez and Spraakman (2012) <sup>[27]</sup> stated that centralization guides to apt and decrease data access through automation. Accordingly, building on the degree of centralization and other ERP systems characteristic-integration, standardization, routinization and centralization- of business process systems becomes an imperative matter for ERP systems studies.

Lastly, the centralization of business process by using either centralized or decentralized business process Lee *et al.* (2003) <sup>[15]</sup> or utilizing Orman (1998) <sup>[20]</sup> and examine the level of centralization.

#### 3. Conclusion and discussion

The current study extended existing research on ERP system, particularly, this study extended Scapens and Jazayeri (2003) <sup>[28]</sup> by means of discovering ERP systems business process characteristics. Prior studies did not measure ERP systems in the best way and most studies and researchers particularly in ERP field and management accounting area utilizing qualitative method analysis. This study provided new characteristics for ERP systems which accelerate the chances for prospect investigation by implementing a quantitative approach and look away from understanding and further inspect the role and impact of ERP systems. Nevertheless, it is undistinguishable until experiential evidence can support the research note.

There are numerous applied and scholarly implications that can result from current study. Essentially Executives in businesses bearing in mind ERP implementations could benefit from this study to better comprehend implications for management and accounting to create suitable arrangements for ERP implementations. For instance, companies can make beforehand for the standardization of accounts. From an academic perspective, studies are recommended to employ the four business process characteristics to measure and evaluate ERP systems to observe ideal results for their researches.

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