

Thinking Outside Operations: Towards A Mechanism for M&A, Innovation and Strategic Decisions with Enterprise Systems

Completed Research Paper

Prithvi Bhattacharya

Abstract

Enterprise Systems (ES) have been widely regarded, for some time now, for enabling operational efficiency for adopting organizations. Currently, the potential of such systems to go beyond improving operations is emerging as a popular area of investigation. The aim of this study is to a) identify the means of business value creation, beyond operational efficiency, that Enterprise Systems can enable and b) understand the mechanism through which such ES-enabled business value creation can happen. The contribution of this paper is that it presents and empirically tests a new conceptual model that seeks to explain the mechanism through which ES enable M&A, Innovation and Strategic Decisions in adopting organizations.

Keywords: Enterprise Systems, Innovation, Mergers & Acquisitions, Business Value

Introduction

While currently Enterprise Systems, have become widely popular with most organizations, the different means through which they can create business value, other than improving operations, has not been explored much (Ruivo et Al. 2014). Enterprise Systems (ES) can be defined as large-scale, packaged, application software systems that can be used to streamline and integrate the business processes of an organization, and considerably improve information and knowledge levels within the organization as well as with its customers and suppliers (Davenport 2000). In modern times, ES has become term that includes a number of systems like Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), Supplier Relationship Management (SRM), Supply Chain Management (SCM) and others. However, for the purpose of this research, the application of the term ‘Enterprise Systems’ is limited to Enterprise Resource Planning (ERP), its industry-specific variants, and/or Customer Relationship Management (CRM), with built-in Business Intelligence (BI) technologies associated with them. This choice is made because of their clear dominance, in scope of their functionality and the number of adopting organizations, over their counterparts (Davenport 2004).

Given the highly complex nature of such systems, they require substantial and continuous involvement, time and investments from the organizations that implement them. This brings us to the fundamental questions of business organizations - ‘Is this all worth it?’ or ‘What is the value added?’ Such value can be achieved through different ways: improving efficiency of operations and cost savings thereof, innovative service, strategic positioning, improved decision making and so on (Smith and McKeen 2003). Enterprise Systems, when implemented effectively, have been reported to enable operational benefits like error reduction, faster transaction processing, and improved productivity for the adopting organizations (Markus and Tanis 2000; Motiwalla and Thomson 2009). But how Enterprise Systems can create value beyond improving operations has not been explored much. There is even less research on the pathway and mechanism through which such value can be created. Given the dominance of

Enterprise Systems as the preferred IT platform and the enormous investments they warrant, it would be immensely useful to get an insight on the above-mentioned topic. This leads to the research question:

How can Enterprise Systems enable business value creation, beyond operational efficiency, for adopting organizations?

How Enterprise Systems Enable Business Value beyond Operational Efficiency: Towards A New Model

A new process model is proposed to answer the research question: How can Enterprise Systems enable business value creation, beyond operational efficiency, for organizations?

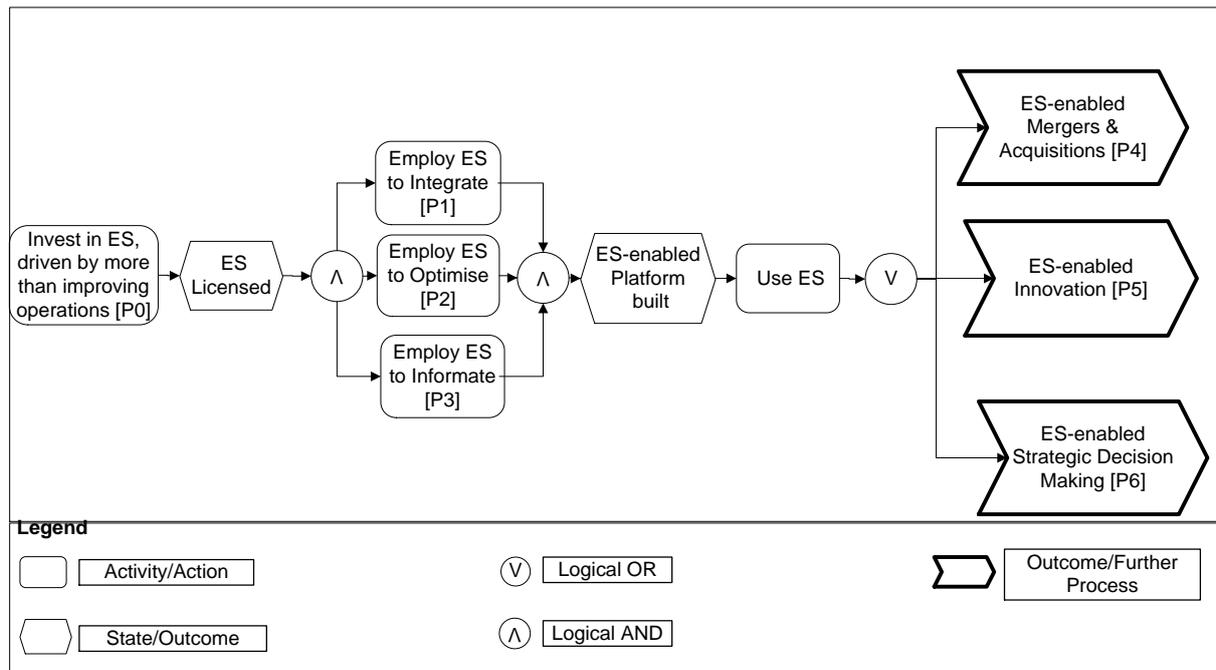


Figure 1. A Process Model for how Enterprise Systems enable Business Value

The Process Model is depicted using Event Process Chain (EPC) notation. This notation is one of the de facto standards for modeling processes, especially in the area of Enterprise Systems. In this notation, a hexagon denotes a state/event/outcome, a rectangle denotes an activity/action, and the operators have their usual meanings as in Boolean logic - \wedge denotes LOGICAL AND (all of) and \vee denotes LOGICAL OR (one or more of). In the model shown, each activity/action or state/outcome is shown as a numbered step, starting at Step 1 and ending at Step 6.

Process models focus on the dynamics of social change. They depict a series of events over a period of time and use this to elucidate how and why particular results are reached. It is necessary to execute each step in a process model, in order, to ultimately achieve the outcome of the process (Soh and Markus 1995). The proposed model, is in essence, a synthesis of two key pieces of research that have been produced based on several prior studies, and in turn have been widely cited in many other studies. These are (a) a model representing how business benefits are realised from Enterprise Systems by Davenport et al. (2004) and (b) a framework of different types of benefits of Enterprise System by Shang and Seddon (2002).

Davenport et al.'s model suggests a process that initiates with exploring Enterprise Systems before investing in them. Subsequently, these systems are implemented extensively and, post-go-live, these systems are used to 'Integrate', 'Optimise' and 'Informate'. However, in this model, benefits are used as an umbrella term, possibly assuming all benefits are realised in the same way. This approach can be questioned, given that not all benefits are realised at the same time, nor it seems plausible that all types of benefits can realised through the same mechanism. In other words, the model does not specify what features of Enterprise Systems drives what kinds of benefits. On the other hand, Shang and Seddon

(2002), identified the different types of benefits from Enterprise Systems to be Operational, Strategic, Managerial, IT Infrastructural, and Organizational. However, this study has studied the mechanism or the pathway, across time, to enable business value through these means.

The next section explains and justifies a new Process Model (as shown in Figure 1), which aims to synthesize the above two models, and also attempts to address the shortcomings of each.

Step 1: Invest in Enterprise Systems, driven by more than improving operations

The first step of the model in Figure 1 proposes that organizations adopt Enterprise Systems driven by both operational efficiency as well as benefits beyond it. An appropriate Enterprise System is selected, purchased and licensed from an appropriate vendor. Most often, these initiatives are driven by the overall business strategy of the organization. Holland and Light (2001), Hayes et al. (2001) and Ruivo et al. (2014) argue that adopting organizations ultimately aim to use ERP systems for strategic purposes. A study by Ragowsky et al. (2005) suggests that whether a firm follows cost leadership or differentiation as its core strategy, an ERP system adds value to its primary activities to attain its goals. Al-Mashari (2003), based on several case studies on large organizations like Kodak, Bay Network, and Airbus, reports that organizations implement ERP Systems with the objective of gaining better market share and going global, in addition to improving operations. UPS, the parcel delivery giant, implemented Oracle Enterprise Systems to provide a range of services to customers, in addition to transportation of goods, as a means of product/service differentiation (Motiwalla and Thomson 2009). All these sources suggest that organizations adopt ES hoping for benefits beyond just operational efficiency. This leads to the following proposition: *P0. Organizations adopt an Enterprise System with the objective of getting more than operational efficiency*

Step 2: Enterprise Systems licensed

As shown in the second step of the model in Figure 1, the outcome of the preceding action is that the organization has an appropriate Enterprise System licensed from the chosen vendor.

Step 3 [A, B, C]: Employ Enterprise Systems to Integrate, Optimise and Informate

As a part of the implementation project(s), the organization employs this Enterprise System software to build a platform. As shown in the third step of the model in Figure 1, there are three high-level actions, all of which the adopting organization takes to build such a platform:

- Employ the ES to Integrate data and systems
- Employ the ES to Optimise processes
- Employ the ES to Informate

These three actions are based on the work of Davenport et al (2004). In addition, these three constructs have been identified as three drivers of long-term benefits. Also, each of these three constructs – integrate, optimise and informate, has been proposed to be important by several researchers in the study of Enterprise Systems. (Davenport 2000; Markus 2000; Al-Mashari 2003; Grant 2003; Spathis and Constantinides 2003; Gattiker and Goodhue 2004; Puschmann and Alt 2004; Utecht and Hayes 2004; Botta-Genoulaz and Millet 2005; Chand et al. 2005; Kelle and Akbulut 2005; Volkoff et al. 2005; Richardson and Krammergaard 2006; Karimi et al. 2007).

One of the key value propositions of Enterprise Systems is integration. Enterprise Systems promise to enable integration by centralizing operational information in a single place so that it can be shared by different application systems of the organization (Davenport 2000; Al-Mashari 2003; Grant 2003; Spathis and Constantinides 2003; Puschmann and Alt 2004; Kelle and Akbulut 2005). In addition, Enterprise Systems frequently also propose standardizing the different business processes across different geographical areas i.e. different locations of the organization. There are several approaches to ‘integrating’ using Enterprise Systems. One way of integrating systems using Enterprise Systems is to use a single global instance which is a particular set of applications with one single database. Consolidating different systems and/or applications into a single global instance has been seen to

improve integration and significantly diminish costs. In summary, the above logic and the empirical evidence reported by several researchers suggest that integration is a key driver of creating business value from Enterprise Systems in organizations.

Process optimization is any effort to enhance the efficiency and effectiveness of the processes of an organization. Organizations have always looked at re-designing or re-engineering their processes to achieve better outcomes (Al-Mashari 2003). Although not many firms are interested in the radical new process designs suggested in the initial re-engineering, there is still a necessity to refine and constantly enhance business processes. One of the reasons that Enterprise Systems became popular was the concept of business process re-engineering. These systems have the so-called 'best practice' processes built into them. These processes are meant to be optimised and can be fitted to run the processes of the organization in an efficient manner. ES vendors promise access to 'best practice' process templates that they have developed from other leading organizations. Process re-engineering should not be limited to the operational processes like it was in the past. A number of 'front-end' value-creating processes like marketing, product development and even strategic planning and analysis should be revisited and re-engineered. There are specific modules in all the Enterprise Software packages from the leading vendors like SAP that support each of these processes. Optimisation and streamlining of business processes is enabled by Enterprise Systems in the adopting firms (Al-Mashari 2003; Spathis and Constantinides 2003; Siau and Messersmith 2003; Chand et al. 2005; Rikhardsson and Krammergaard 2006).

A term originally used by Shoshana Zuboff in her book 'In the Age of the Smart Machine' (1988) and later adopted by Davenport et al. (2004), 'Informate' means to transform data into context-rich information and applying that information to support business analysis and decision making. Availability of good quality information in real time is identified as a key product of ERP systems by several studies in several countries (Davenport 2000; Spathis and Constantinides 2003; Botta-Genoulaz and Millet 2005; Rikhardsson and Krammergaard 2006; Harley and Wright 2006). This capability has led to better operational control and decision making by the management of the studied firms. Harris and Davenport (2006) report that 59% of organizations believe analytics for decision-making to be a key capability of Enterprise Systems. From the above, it can be inferred that 'informate', or improved access to information, is an important driver of business value creation in organizations.

This insight from the above paragraphs can be stated as the following propositions:

- P1. Organizations seeking to create business value from an Enterprise System employ it to 'integrate' data and systems
- P2. Organizations seeking to create business value from an Enterprise System employ it to 'optimise' processes
- P3. Organizations seeking to create business value from an Enterprise System employ it to 'informate'

Step 4: ES- Enabled Platform Built

As explained in the previous step, the organization employs this Enterprise System software to build a platform. As a result of Step three and as explained earlier, the organization will now have a platform with

- Integrated data and systems
- Optimised business processes
- Access to Information and Insight

Step 5: Use the Enterprise System

As shown in the fifth step of the model in Figure 1, the model posits that the organization puts the ES-enabled integrated, optimised and informing platform into use to achieve its desired outcomes, as defined by the business case for the adoption of the project. After the Enterprise System is put in production, the organization then runs its business using this Enterprise System-enabled platform to achieve the outcomes after the 'shakedown' phase (as defined by Markus and Tanis 2000).

Step 6 [A,B,C]: Enterprise System-enabled Business Value : Beyond Operational Efficiency

As shown in the sixth step of the model in Figure 1, the goal of the adoption of ES is to enable business value by the organization beyond operational efficiency. However, such value will be realized after a period of time of using the Enterprise System, and usually after the first order value, i.e. operational efficiency is realized. Hence such value can be called second-order business value.

Such second order business value creation may be by one or more of the following means:

- Mergers and Acquisitions, as suggested by Gupta (2000), Grainger (2007), Mehta and Hirschheim (2007), Weill and Ross (2009) and Lorenzo et al. (2017)
- Innovation, as suggested by Rajagopal (2002), Bradford (2003), Swanson and Pang (2005) and King and Burgess (2006), Srivardhana (2007), Sedera et al. (2016)
- Strategic decision-making, as suggested by Bligh and Turk (2004), Spathis and Constantinides (2004), Rom and Rohde (2006), Goodhue et al (2002), Rigby and Ledingham (2004), and Mostaghel et al. (2015)

The choice of these means of creating business value is also based on the works of Shang and Seddon (2002). This study is in turn based on a number of studies in the area of business value of IT, as discussed in the literature review section earlier. Also this study has been widely cited by many other studies in this area. Therefore, these studies are considered to be quite comprehensive in covering the different types of business value from Enterprise Systems. Also, it is not the intention of this model to suggest that these means of business value cannot be enabled without Enterprise Systems. Instead, the model proposes that Enterprise Systems ‘enable’ the creation of business value through these means, where ‘enable’ means facilitate, support or make easier.

In the model it is argued that Enterprise Systems can enable business value creation (beyond operational efficiency) through one or more of the following means, not necessarily all of them.

Step 6A. ES-enabled Mergers and Acquisitions

Mergers and acquisitions (M&A) occur when two or more organizations join all or part of their operations. The businesses of both organizations are brought together as one (Doyle 2000). In this research, it is proposed that Enterprise Systems can enable Mergers and Acquisitions by supporting the integration of people, processes and systems. It is argued that the integrated data and systems [Step 3a] enabled by Enterprise Systems leads to the ability of the organization to undertake mergers and acquisitions. Having isolated systems in the different business functions in the areas of finance, human resources, operations and others causes difficulty in an organization and is detrimental for its success. This problem is greatly magnified when there is a merger or acquisition. A major problem in post-acquisition integration of mergers and acquisition is to combine a plethora of isolated systems of the two (or more) organizations. This means that the greater the number of systems in the acquiring organization, the more difficulty it poses in post-acquisition integration. Enterprise Systems, by definition, are integrated systems, i.e. different systems components are logically integrated into a single system. So having Enterprise Systems in place means that during the ‘post-acquisition integration’ phase of a merger of two organizations, the acquiring organization has a single system to integrate with the systems of the acquired organizations. ERP systems adopted by manufacturer firms have been reported to assist in quickly integrating systems following mergers and acquisitions in prior studies (Gupta 2000; Grainger 2007). For example, Danisco, a global food ingredients organization built its ‘growth-by-acquisition’ strategy based on its SAP ERP and CRM platform, which it used to integrate its acquiring organizations into (Yetton et al. 2013).

From the above discussion, it can be argued that Enterprise Systems enable Mergers and Acquisitions in the adopting organization by supporting post-acquisition integration of the initiative. This leads us to the following proposition: *P4*. Enterprise Systems enable adopting organizations to undertake mergers and acquisitions

Step 6B. ES-enabled Innovation

The term ‘innovation’ was made widely popular by J. Schumpeter (1943) who argued that innovation often creates temporary monopolies allowing abnormal profits, which provides the incentive necessary for firms to develop new products and processes. In this research, it is argued that the optimised business processes and access to information and insight enabled by Enterprise Systems leads to the ability of the organization to undertake innovation in product and process.

The availability of information in the Enterprise Systems can be used to identify customer needs – the basis for new products or services. CRM systems have the potential for increasing market share through new and better product/service designs by understanding customer needs better (Bligh and Turk 2004). An example is the idea of offering customized food and accommodation packages in hotels that would draw more customers. This can be done by analyzing the integrated information in the ES using the analysis tools (like OLAP and data mining) provided by the ES, to find out what kind of a package would be most sought after by customers. CRM systems have enabled a 10% improvement in customer analysis, increasing profits by \$50 million in \$1 billion firms (Buttle 2004). NAB claims that its Oracle Fusion Middleware-based core-banking program enables it to offer new products like online banking services (Tay 2012a).

Often, the new product is an ES-enabled product/service that is developed using the Enterprise System. It is possible to offer a new service by integrating the organization with its value-chain members backward or forward to develop a new service. UPS, the parcel delivery giant, implemented Oracle Enterprise Systems to provide a range of services to customers in addition to the transportation of goods, including tracking deliveries as a means of product/service differentiation (Motiwalla and Thomson 2009). An example is offering a new service of obtaining bank loans online to the customers of a bank. This is done based on the availability of integrated real-time data, inter-organizational systems integration and optimised processes for electronic approvals through workflows within the optimised processes, enabled by the Enterprise System.

Process innovation involves creating new processes or wholly redesigning existing processes. For example, in Geneva Pharmaceuticals, business processes were categorized into supply and demand groups, and processes in each of the two groups were re-engineered and then integrated (Bhattacharjee, 1999). Again, in Textiles PLC, business processes were revamped to fit the strategy of one global organization using the Enterprise System (Holland & Light, 1999). Wipro Consulting adopted ERP to implement Human Resource self-service: a new model for managing their strategic resources, i.e., employees (Motiwalla and Thomson 2009). Linfox Ltd claims that by working with SAP it has been able to build a logistics platform that is unmatched by its competitors (Tay 2012b).

Such new processes were enabled by the integrated, cross functional data and optimised processes available from the Enterprise System. So it can be argued that Enterprise Systems can enable undertaking innovation – in product and process. This leads us to the following proposition: *P5*. Enterprise Systems enable adopting organizations to undertake innovation

Step 6C. ES-enabled Strategic Decision Making

Strategic decision making involves making ‘intentional choices or programmed responses about issues that materially affect the survival prospects, wellbeing and nature of the organization’ (Schoemaker 1993 p.107). Strategic decisions ultimately are a ‘compromise between offence and defense with the optimum balance dependent on awareness of external conditions and skillful utilization of internal resources’ (Harrison 1996 p.47).

It is argued that the access to information and insight enabled by Enterprise Systems leads to the ability of the organization to undertake strategic decision making.

A survey revealed that ERP systems enable profitability analysis by business segments and non-financial indicators that assist in top management strategic decision making (Spathis and Constantinides 2004). The Data warehouse and BI technologies that come as a part of ES are pivotal for Enterprise Performance Management that translate the business strategy into Key Performance Indicators and

analyse them to reveal how the organization is performing (Bose 2006). Davenport (2006) suggests that Enterprise Systems can be used to support strategic decisions like identifying the most profitable customers and retaining them, determining the optimum price for maximum yield, and selecting best employees at optimum compensation levels. A study by Rom and Rohde (2006) suggested that a tight collaboration with ERP and Strategic Enterprise Management Systems (which is built-in to ERP Systems now) is very beneficial for a coordination of tactical and strategic decision making. From the above discussion, it can be argued that Enterprise Systems can enable the process of strategic decision making in the adopting organization. This leads us to the following proposition: *P6. Enterprise Systems enable adopting organizations to make strategic decisions.*

An Empirical Test of the Model

Methodology

It is useful in research to use existing information wherever possible before venturing out to collect new data. Secondary data is data that is in existence already and was collected for a purpose other than the research project in question (Newman 2003). Analysis of such data is called 'secondary data analysis'. Such data can be sourced from internet resources, specialist agencies and organizations such as Gartner, organizational documents, archival material and so on. Use of secondary data in conducting research has been advocated by several researchers like Jarvenpaa (1991), Ticehurst and Veal (2000), and Newman (2003), and Seddon et al. (2010). According to Berelson (1952), Content Analysis is a research method for the objective, systematic and qualitative description of the manifest content of communication. The 'content' refers to words, pictures, symbols, ideas, themes or anything that can be communicated (Neuman and Kreuger 2003). In other words, Content Analysis is a way of analyzing documents with a view to classify, and sometimes, quantify, content in terms of "predetermined categories" and in a systematic and replicable manner (Bryman and Bell 2003). For the purpose of this research, a pool of data was found in the form of vendor-published customer cases of firms that have adopted ERP/ CRM Systems. These have been endorsed by the client firms and published as business transformation stories of customer organizations enabled by SAP ERP and/or CRM systems (including in-built business intelligence technologies). These contain the contact details of the organizations as well as their top management members, along with quotes from their interviews. These success stories can therefore be treated as credible information provided by the client organizations themselves. A sample of 100 cases of large firms from across the world operating in different industries was selected. About 70 of these cases are short (two pages or so), and about 30 cases are longer and more detailed (15-16 pages). These cases were found at: www.sap.com/solutions/business-suite/erp/customers/index.epx and www.sap.com/solutions/business-suite/crm/customers/index.epx. These 100 cases were downloaded and saved as local PDF files in the researcher's desktop computer.

Such published cases were endorsed by the client firms and published as business-transformation published cases of customer organizations using sap ERP and/or CRM systems (including in-built business intelligence technologies). These published cases contain information about the following aspects: Organization's background and business strategy, Objectives of adoption of Enterprise Systems, Details of implementation such as modules implemented, costs, and timeline, Benefits realized with financial figures or clear illustrations and Future roadmap.

The data thus obtained was subjected to content analysis. Each success story was reviewed to find evidence for the constructs of the proposed model. Wherever found, such evidence was marked and annotated using a coding scheme used for this purpose.

Although published by the vendor, these published cases contain contact details of the organizations as well as top management members with quotations from their interviews. They can therefore be treated as selective interpretations of information provided by the client organizations.

These published cases served as secondary data (Jarvenpaa, 1991) for testing the proposed model. This research method combines some of the strengths of both a survey and a case study. Being reasonably content intensive, vendor-provided customer published cases provide an insight to each user organization as is possible with case studies. In addition, the use of a large number of published cases

provides a means to obtain information across different industries in different parts of the world, as is done in a survey. Though not collected first-hand by the researcher, these multiple stories provide verifiable data for review and analysis.

Since these published cases are provided by vendors, there can be two potential issues with such data:

- The data may be not be considered to be credible
- The data may not truly reflect the opinions of the members of the client organizations

However, these two issues are addressed in the following ways:

These published cases are from the most reputed vendor of Enterprise Systems (SAP) and are publicly available; hence they bear little risk of being false. These published cases contain the contact details of the organizations as well as their top management members with quotes from their interviews for verification and validation. Moreover, use of vendor-published cases has been used in prior research on Enterprise Systems namely in the study by Shang and Seddon (2002) and others.

Results

The results of testing the propositions of the model are presented in two parts: the first part uses a small number of stories from the sample of 100 stories to illustrate the evidence of support for the model. The second part presents a summary of evidence found across all the 100 stories to support the model.

Part 1: Illustrative Extracts of Support for the Propositions

The first set of evidence of support for the propositions of the Process model is provided in the form of example extracts (in the form of quotations from the speakers or document extracts) from the published cases.

Table 1. Illustrative Evidence of Support for the Propositions of the Model

<p><i>P0. Organizations adopt an Enterprise System with the objective of getting more than operational efficiency</i></p> <ul style="list-style-type: none"> ➤ Canadian National Railway Company (CNRC), the leader in North American rail industry, made a strategic decision to adopt ERP to assist its growth strategy through mergers and acquisitions of four other railways, and improve information levels and analytics capability for operational efficiency ➤ Medline, the biggest private-owned manufacturer and distributor of healthcare products in the USA, decided to adopt mySAP Customer Relationship Management (mySAP CRM) to improve its ability to better manage orders, pricing and customer information. ➤ Asian Paints, the third largest painting company in Asia, adopted SAP Customer Relationship Management (CRM) solution to transform its business from offering products to offering services ➤ Air Products, a leading supplier of atmospheric gases, processes, and specialty gases and equipments decided to integrate all of the business units into a single organization with a constant set of business processes by adopting SAP ERP system.
<p><i>P1. Organizations seeking to create business value from an Enterprise System employ it to "integrate" data and systems</i></p>

- “To date, CNRC has integrated and consolidated the functionality and data from over 100 computer applications into one seamless SAP platform.” (Fred Grigsby, Senior Vice-President and Chief Information Officer, Canadian National Railway Company)
- “We have seen significant payback from our investment in installing SAP [software]... we are getting things right at the source, only entering things once, not reconciling between systems, and retiring our legacy systems.” (Paul Huck, Senior Vice President and Chief Financial Officer, Air Products)
- “Bosch Thermotechnik GmbH was running SAP enterprise resource planning (ERP) software to support the company’s order-handling and financial processes. Use of the SAP Customer Relationship Management application would provide a single repository for Bosch Thermotechnik GmbH’s customer data, and the companies would be able to tightly integrate the CRM functionality with the existing ERP backbone.” (Document Extract)
- “MySAP CRM integrates better with SAP R/3 software than alternative solutions. The company implemented the mobile sales and interaction center functionality of mySAP CRM, migrating customer and product data from the three legacy systems and consolidating the data in the new system.”(Document Extract)

P2. Organizations seeking to create business value from an Enterprise System employ it to "optimise" processes

- “MySAP ERP helped Tasty Baking set up more consistent and disciplined processes. A majority of the processes had to be changed. SAP forced us to be far more rigorous and disciplined in our processes. This was painful at first but the information we have today and the processes in place are far better.” (Ed Pixler, Plant Manager, Oxford, PA, Tasty Baking)
- "We have gotten our IT costs down and streamlined our European operations. The shared service centers still follow a country-centric approach, but eventually all European operations should follow the same blueprint for standards and processes. Over time we will also look to consolidate the various shared service centers into one." (Sal Dona, CEO, Checkpoint)
- “Everything is more real-time now the sales reps know the standard price, which allows them to set an appropriate customer-specific price. For example, a rep can sit down with a customer at 9 a.m., agree on a price by 9:15, and place an order by 10 – well in advance of the delivery cutoff time in placing an order for that day. That’s a very seamless process, and we didn’t have that capability before.” (Jeff Boswell, IT Manager, e-commerce and CRM, Medline)
- “Even though complex requests are becoming more frequent and time-consuming, the Port of San Diego now has more effective processes for handling incoming calls, and it has reduced the time necessary to respond to customer requests by 67% over the 2004 to 2006 time period. The port has achieved a greater accuracy of response, and it has increased from zero to a range of 10% to 25% the number of calls that can be closed during the first contact, a result of deploying the solutions database.” (Document Extract)

P3. Organizations seeking to create business value from an Enterprise System employ it to "informate"

- “Air Products formed the One Company initiative under which it resolved to transform its business groups into a single unified organization with shared common applications and uniform simplified practices for using them. With a single implementation, all users access the same database using the same user interface with no variances anywhere in the enterprise with respect to the way processes are performed. This decision assured consistency of information for decision making and greatly facilitated information sharing and report generation.”(Document Extract)
- “Medline found that the strong integration between mySAP CRM and the mySAP ERP application provides many benefits – for example, visibility by field sales into up-to-date order status, pricing, and customer information, enabling faster and better decision making in the field” (Document Extract)
- "We can now pull out meaningful reports at the European level. Reporting has really been a major advantage of SAP and the feedback from users has been excellent. We cannot quantify the value of timely and high-quality management information, but we know it has been of paramount importance to us." (Paul van der Mark, European Applications Manager, Checkpoint)
- “By moving the company to a uniform, professional, and well-supported CRM system, we are attaining important operational improvements, achieving faster and better decision making, delivering better support to our customers, and further cementing Synopsys as the best-in-class EDA company – period.” (Aart J. de Geus, CEO, Synopsys)

<p>P4. Enterprise Systems enable adopting organizations to undertake mergers and acquisitions</p> <ul style="list-style-type: none"> ➤ “SAP solutions reduced the time [for CNRC] to integrate the acquisitions of Illinois Central, Wisconsin Central, Great Lakes Transportation, and British Columbia Rail, and they helped increase the speed to value realization.” (Document Extract)
<p>P5. Enterprise Systems enable adopting organizations to undertake innovation</p> <ul style="list-style-type: none"> ➤ “Usage-based billing, which is enabled by SAP applications and is unique to FP in the market, affords a competitive advantage. The company plans to continue developing and marketing this capability so that it adds value for customers and distinguishes FP as a provider of innovative services for franking machine users.” (Document Extract) ➤ “SAP CRM transformed our organization and allowed us to expand into the services business” (Deepak Bhosale, Senior Manager, Asian Paints) ➤ “We now have the tools to better understand our customers’ gas usage, pursue new opportunities, and grow our business”(Steve Murphy, Director of Commercial and Industrial Marketing, Alabama Gas Corporation, a part of Energen Corporation) ➤ “SAP E-Commerce has helped customers help themselves. Medline.com allows customers to place orders, track existing orders, confirm pricing, and perform other transactions, enabling direct access by customers. Customers tell us that they like being in control – they can access the site at their convenience, place orders, and find all the information they need.” (Dave Rolston, Vice President of E-Business, Medline Industries Inc.) ➤ “We can now offer our customers flexible contract management and have thus achieved a new level of customer retention.” (Pascal Miet, Director of International IT and Process Management, Francotyp-Postalia AG) ➤ “The team [at Port of San Diego] designed new processes, focusing on using mySAP CRM to standardize customer-facing processes across more than 20 departments” (Document Extract) ➤ “We completely changed the business in one fell swoop.” (Craig Williams, Director, Global Supply Chain – Plan, Executive Process Owner, Air Products)
<p>P6. Enterprise Systems enable adopting organizations to make strategic decisions</p> <ul style="list-style-type: none"> ➤ “The new solution gives Asian Paints greater visibility into all customer interactions. As a result, the company has gained a deeper understanding of the needs of its end customers and has tailored its service business to meet these needs.” (Document Extract, Asian Paints) ➤ “The company was now able to quickly identify opportunities – such as construction of a new shopping mall” (Document extract, Energen) ➤ “Now that we’re performing processes the same way throughout the company, we’ve become better at looking at things globally. As a result, we’ll find many more ways to take advantage of what we’ve accomplished.” (Cheryl Flannery, former SAP ERP IT Program Director; current Director, IT Planning, Relationship, Risk Management, Air Products) ➤ “We use SAP CRM to monitor worldwide trends. For example, if we identify problems in several of our power applications that prevent customer success, we can deploy the right R&D resources to correct the problems.” (Fabio Angelillis, Vice President-Engineering and R&D, Silicon Engineering Group, Synopsys) ➤ “The marketing group [at Port of San Diego] is using data generated by mySAP CRM to better understand why customers call the port and to determine whether there are any marketing initiatives that can be pursued to address unmet needs.” (Document Extract)

Part 2: Summary Statistics from the Full Sample

The next set of evidence shows the number of published cases in which support for each of the propositions was found. Each of the 100 published cases was analysed individually to find evidence for each of the propositions of the model. Evidence of support for each proposition (like the quotes shown in Table 1) was marked wherever found. Table 2 shows a summary of the total number of cases that supported the propositions.

Table 2. Summary of Evidence of Support for the Propositions of the Model

Proposition	No. of Published cases with evidence of support
P0. Organizations adopt an Enterprise System with the objective of getting more than operational efficiency	100
P1. Organizations seeking to create business value from an Enterprise System employ it to 'integrate' data and systems	98
P2. Organizations seeking to create business value from an Enterprise System employ it to 'optimise' processes	93
P3. Organizations seeking to create business value from an Enterprise System employ it to 'informate'	93
P4. Enterprise Systems enable adopting organizations to undertake mergers and Acquisitions	23
P5. Enterprise Systems enable adopting organizations to undertake innovation	66
P6. Enterprise Systems enable adopting organizations to make strategic decisions	67

Discussion

The proposed model was empirically tested and the results from analysis of 100 published cases are summarized in Table 2. The fact that all the propositions are supported by at least one success story (as shown in Table 2), shows that some evidence of support is found for the model. Also, it may be noted that the argument in this thesis is that Enterprise Systems can enable business value creation, as proposed by the Process Model; it is not claimed that they always will. The results suggest that a very high (90+) number of organizations in the published cases used Enterprise Systems to achieve an integrated, optimized and informing platform. These systems enabled innovation in product and/or process in 66% of the published cases, better strategic decision making in 67% of the published cases and mergers and acquisitions in 23% of the published cases. Because all totals in Table 2 except for P4 are above 50%, the evidence of support for the Process Model in Figure 1 may be described as strong. In other words, there was strong support found for six (out of seven) propositions and, therefore, the process model itself, from the sample of 100 published cases. Proposition P4 is unique in the sense that it is only applicable to organizations that intend to grow through mergers and acquisitions. It is possible that not many of the organizations in the sample studied have mergers and acquisitions as their strategy for growth, leading to a lack of stronger evidence for P4 in most organizations. Given the logic and increasing indications towards the role of Enterprise Systems in enabling mergers and acquisitions in recent research, this proposition is retained in the model to be explored further.

Conclusion

This paper reports on an investigation on the potential of Enterprise Systems (ES) in enabling business value creation beyond operational efficiency. A new process model was proposed attempting to explain the mechanism through which this can happen. Also, it may be noted that the argument in this paper is that Enterprise Systems *can* enable business value creation, as proposed by the Process Model; it is not claimed that they *always will*.

The contributions of this paper are two-fold, as discussed below. Firstly, it provides a synthesis of the related but isolated themes: (a) types of Business Value from Enterprise Systems and (b) the pathway and/or mechanism to realize business value from Enterprise Systems. The paper attempts to present a model combining what is best known about the above-mentioned two themes individually to arrive at a comprehensive explanation of how Enterprise Systems can create business value beyond operational efficiency.

Secondly, this paper extends knowledge about using Enterprise Systems to enable business value by providing insight, proposing a new model, into the pathway and the mechanism of how ES-enabled

business value is created beyond operational efficiency, an aspect still in early stages of research, as found in the literature.

The limitation of this paper is that though it presents a new model based on literature review and logic and empirically tested using secondary data, but it lacks the in-depth empirical testing possible only through detailed case studies. The model needs to be tested with empirical data using detailed case studies of organizations from around the world.

References

- Al-Mashari, M. 2003 "A Process Change Oriented Model for ERP Application," *International Journal of Human Computer Interaction* (16:1), pp. 39-55.
- Berelson, B. 1952. Content analysis in communication research.
- Bhattacharjee, A. 1999 "SAP R/3 implementation at Geneva Pharmaceuticals,"
- Bligh, P., and Turk, D. 2004 CRM Unplugged: Releasing CRM's strategic value John Wiley & Sons Inc.
- Bose, R. 2006 "Understanding management data systems for enterprise performance management," *Industrial Management & Data Systems* (106:1), pp. 43-59.
- Botta-Genoulaz, V., and Millet, P. 2005 "A classification for better use of ERP systems," *Computers in Industry* (56:6), pp. 573-587
- Bradford, M., and Florin, J. 2003 "Examining the role of innovation diffusion factors on the implementation success of enterprise resource planning systems," *International Journal of Accounting Information Systems* (4:3), pp. 205-225.
- Bryman, A., & Bell, E. 2003. Breaking down the quantitative/qualitative divide. *Business Research Methods*, pp. 465-478.
- Buttle, F. 2004 Customer Relationship Management Concepts and Tools Elsevier.
- Chand, D., Hachey, G., Hunton, J., Owhoso, V., and Vasudevan, S. 2005 "A balanced scorecard based framework for assessing the strategic impacts of ERP Systems," *Computers in Industry* (56) , pp. 558–572.
- Davenport, T. 2000 Mission Critical: Realising the Promise of Enterprise Systems Harvard Business School Press.
- Davenport, T. 2006 "Competing On Analytics," *Harvard Business Review* (84:1).
- Davenport, T., JG Harris, and Cantrell, S. 2004 "Enterprise systems and ongoing process change," *Business Process Management Journal* (10:1), pp. 16-26.
- Doyle, B. 2000 Mergers and Acquisitions Glenlake, Chicago.
- Gattiker, T., and Goodhue, D. 2004 "Understanding the local-level costs and benefits of ERP through organizational information processing theory," *Information & Management* (41:4), pp. 431-443.
- Goodhue, D.L., Wixom, B.H., and Watson, H.J. 2002 "Realizing Business Benefits Through CRM: Hitting The Right Target In The Right Way," *MIS Quarterly Executive* (1:2).
- Grainger, N., and Mckay, J. 2007 "The Integrative Role of ERP Implementation in Merger and Acquisition" in: *Research into Information Systems in Organisations*, Swinburne University of Technology.
- Grant, G.G. 2003 "Strategic alignment and enterprise systems implementation: the case of Metalco," *Journal of Information Technology* (18), pp. 159–175.
- Gupta, A. 2000 "Enterprise resource planning: the emerging organizational value systems," *Industrial Management and Data Systems* (100:3), pp. 114-118.

- Harley, B., and Wright, C. 2006 "Management Reactions to Technological Change: The Example of ERP," *The Journal of Applied Behavioural Science* (42:1), pp. 58-75.
- Harrison, E.F. 1996 "A process perspective on strategic decision making," *Management Decision* (34:1) , pp. 46-53.
- Hayes, D., Hunton, J., and Reck, J. 2001 "Market Reaction to ERP Implementation Announcements," *Journal of Information Systems* (15:1), pp. 3-18.
- Holland, C.R., and Light, B. 2001 "A Stage Maturity Model for Enterprise Resource Planning Use," *The DATA BASE for Advances in Information Systems* (32:2) , pp. 34 - 45
- Jarvenpaa, S.L. 1991 "Panning for Gold in Information Systems Research: 'Second-Hand' Data," in: *Information Systems Research - Issues, Methods and Practical Guidelines*, Alfred Waller Ltd.
- Karimi, J., Somers, T.M., And Bhattacharjee, A. 2007 "The Role of IS Resources in ERP Capability Building and Business Process Outcomes," *Journal of Management Information Systems* (24:2)
- Kelle, P., and Akbulut, A. 2005 "The role of ERP tools in supply chain information sharing, cooperation, and cost optimization," *International Journal of Production Economics* (93), pp. 41-52.
- King, S.F., and Burgess, T.F. 2006 "Beyond critical success factors: A dynamic model of enterprise system innovation," *International Journal of Information Management* (26:1), pp. 59-69.
- Lorenzo, O., Bjorn, C., Oksana, K., & Angel, D. 2017 Integration through orchestration: the interplay between enterprise systems & inventory management capabilities. *Journal of Enterprise Information Management*.
- Markus, M., and Tanis, C. 2000 "The Enterprise Systems Experience-From Adoption to Success," *Framing the Domains of IT Research*.
- Markus, M.L. 2000 "Paradigm shifts- E-Business and Business Systems Integration," *Communications for the Association of Information Systems* (4:10).
- Mehta, M., and Hirschheim, R. 2007 "Strategic Alignment In Mergers And Acquisitions: Theorizing IS Integration Decision making," *Journal of the Association for Information Systems* (8:3), 03, 143-174.
- Mostaghel, R., Oghazi, P., Beheshti, H. M., & Hultman, M. 2015 Strategic use of enterprise systems among service firms: Antecedents and consequences. *Journal of Business Research*, (68:7), pp. 1544–1549
- Motiwalla, L., and Thomson, J. 2009 *Enterprise Systems for Management* Prentice Hall,
- Neuman, W. L., & Kreuger, L. 2003. *Social work research methods: Qualitative and quantitative approaches*. Allyn and Bacon.
- Puschmann, T., and Alt, R. 2004 "Enterprise Application Integration Systems and Architecture-the Case of the Robert Bosch Group," *The Journal of Enterprise Information Management* (17:2), pp. 105 - 116.
- Rajagopal, P. 2002 "An innovation diffusion view of implementation of enterprise resource planning (ERP) systems and development of a research model," *Information and Management* (40:2), pp. 87-114.
- Rigby, D., and Ledingham, D. 2004 "CRM Done Right" Harvard Business Review.
- Rikhardsson, P., and Kræmmergaard, P. 2006 "Identifying the impacts of enterprise system implementation and use: Examples from Denmark," *International Journal of Accounting Information Systems* (7), pp. 36-49.
- Rom, A., and Rohde, C. 2006 "Enterprise Resource Planning, Strategic Enterprise Management Systems and Management Accounting A Danish Study," *Journal of Enterprise Information Management* (19), pp. 50-66.

- Ruivo, P., Oliveira, T., and Neto, M. 2014 "Examine ERP post-implementation stages of use and value: Empirical evidence from Portuguese SMEs", *International Journal of Accounting Information Systems* (15:2), pp. 166-184.
- Schumpeter, J.A. 1943 *Capitalism, Socialism, and Democracy* Routledge.
- Sedera, D., Lokuge, S., Grover, V., Sarker, S., & Sarker, S. 2016 "Innovating with enterprise systems and digital platforms: A contingent resource-based theory view". *Information & Management*, (53:3).
- Shang, S., and Seddon, P. 2002 "Assessing and managing the benefits of enterprise systems: the business manager's perspective," *Information Systems Journal* (12), pp. 271-299.
- Siau, K., and Messersmith, J. 2003 "Analyzing ERP Implementation at a Public University Using the Innovation Strategy Model," *International Journal Of Human-Computer Interaction* (16:1), pp. 57-80.
- Smith, H., and McKeen, J. 2003 "Developments in Practice VII: Developing and Delivering the IT Value Proposition," *Communications of the Association for Information Systems* (11).
- Soh, C., and Markus, M.L. 1995 "How IT Creates Business Value: A Process Theory Synthesis," *International Conference on Information Systems*
- Spathis, C., and Constantinides, S. 2003 "Usefulness of ERP Systems for Effective Management," *Industrial Management and Data Systems* (103:9), pp. 677-685.
- Srivardhana, T., and Pawlowski, S.D. 2007 "ERP systems as an enabler of sustained business process innovation: A knowledge-based view," *The Journal of Strategic Information Systems* (16:1), pp. 51-69.
- Swanson, E.B., and Wang, P. 2005 "Knowing why and how to innovate with packaged business software," *Journal of Information Technology* (20:1), pp. 20-31.
- Tay, L. 2012 "Inside Linfox's vendor-first innovation strategy,".
- Tay, L. 2012 "UBank adopts NAB banking platform," in: IT News.
- Utecht, and Hayes, R. 2004 "Enterprise Resource Planning and the Competitive Advantage," *Competitiveness Review* (14:1), pp. 13-17.
- Volkoff, Strong, D.M., and Elmes, M. 2005 "Understanding Enterprise Systems enabled Integration," *European Journal of Information Systems*, pp. 110-120.
- Weill, P., and Ross, J. 2009 *IT Savvy: What Top Executives Must Know to Go from Pain to Gain*.
- Yetton, P., Henningson, S., & Bjørn-Andersen, N. 2013 "Ready to Acquire: The IT Resources Required for a Growth-by-Acquisition Business Strategy", *MIS Quarterly Executive* (12:1), pp. 19-35.
- Zuboff, S. 1988 *In the age of the smart machine: The future of work and power*.