Identifying Four Key Means of Business Value Creation using Enterprise Systems: An Empirical Study

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ABSTRACT

Enterprise Systems (ES) is increasingly becoming the choice of IT platform for most large organizations in the world. As a result, the potential of such systems to create more business value is of key interest to both industry and academia. The aim of this study is to identify the key means of business value creation that Enterprise Systems can enable. The contribution of this paper is that it identifies and proposes four key means by which Enterprise Systems can create business value: (a) Operational Efficiency (b) Mergers and Acquisitions, (c) Innovation (in product and process), (d) Strategic Decision Making. This paper empirically tests and reports evidence of support for these propositions with empirical data from 100 success cases. This study paves way for further research to explore each of the four means to understand the mechanism of 'how' the value can be created along each of those four means. Also, another area of investigation is whether Enterprise Systems can enable business value creation through any other means, not mentioned in this paper.

Keywords: Business value creation, enterprise systems, value creation

INTRODUCTION

Information Technology has become an integral and indispensable part of the world of business and commerce. In the past few decades, a variant of such technology, called 'Enterprise Systems', has become widely popular with large Australian and multinational organizations, and increasingly so with small to medium-scale businesses. 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 an 'umbrella' term that includes a number of systems like Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), Supplier Relationship Management (SRM), and Supply Chain Management (SCM) and so on. 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 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).

The user base of Enterprise Systems has grown significantly in the last two decades with more and more organizations choosing to purchase such systems over developing their own custom

software. Large and well-known organizations in Australia and the around the world such as Australia Post, University of Melbourne, ExxonMobil, Microsoft, Canadian National Railways, Colgate-Palmolive, Kraft Foods, BHP Billiton, and many others, now run their businesses using Enterprise Systems. Increasingly, medium-sized organizations are also adopting such systems.

In the last two decades, the Enterprise Systems market was inhabited by many vendors, e.g., SAP, Oracle, Baan, PeopleSoft, JD Edwards, and so on. However, as a result of mergers and acquisitions, there are three key players who dominate this market at present: SAP, Oracle, and Microsoft.

It should be noted that implementing these systems involves massive financial investments and significant periods of time and human effort. Given the highly complex nature of such systems, they require substantial and continuous involvement from the organizations that implement them. So organizations have to consider enormous cash outflows in their budgets if they intend to adopt such systems.

Business organizations undertake all investments with one overarching goal in mind - business value. Value means the worth or desirability of an entity or object. The term is subjective, and depends on the context. Business Value' or the value from a business organization's perspective means maximizing shareholder returns, increasing market share, gaining goodwill in the market, expansion and growth etc. 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 & 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 (Davenport, 2000; Markus & Tanis, 2000). This results in increased operational efficiency of these organizations. This contribution of Enterprise Systems can certainly be accepted as creating 'Business Value'. But does this alone justify the costs of their adoption to the adopting organizations?

Information Technology, in general, has been reported to enable business value creation above and beyond improving operational efficiency (Goldsmith, 1991; Earl, 1993; Sambamurthy & Zmud, 1994; Weill & Broadbent, 1998; Sawy et.al. 1999; Tallon et al., 2000; Applegate et al., 2003; Weill & Ross, 2009). With Enterprise Systems as the preferred IT platform, exploiting such systems to compete better in the market has become a trend in the corporate world. But despite these claims by vendors and consultants, there is very limited empirical research that explores the potential of Enterprise Systems, in particular, to enable business value creation beyond improving operations. So there exists an opportunity to look at the strategic potential of Enterprise Systems - the contribution of such systems in enabling business value in addition to improving operations of the adopting organizations.

Informed by the preceding discussion, the question that this research project aims to answer is:

> **What are the key means through which Enterprise Systems enable business value creation in adopting organizations?**

A REVIEW OF THE LITERATURE ON ENTERPRISE SYSTEMS-ENABLED BUSINESS VALUE

Business value from enterprise systems: improving operations

A review of the literature on the benefits or 'business value' from Enterprise Systems revealed that the most commonly reported means by which these systems enable value is by improving the way operations are run, i.e., by enabling operational efficiency. Operational efficiency can be said to be the ability to deliver products or services to its customers in the most cost-effective manner possible while still ensuring the high quality of its products, service and support.

IT, in general, has been proposed to enable business value creation, especially in improving operations, for a long time now (Hitt & Brynjolfsson 1996; Devaraj & Kohli 2003). IT has been found to be offer a variety of benefits from cost reduction and productivity enhancement to flexibility and quality improvement (Melville et al. 2004). The term 'IT business value' is commonly used to refer to the impacts of IT on the organizational performance, including increased productivity, higher profitability, diminished costs, competitive advantage, inventory reduction, and many others.

As a variant of IT, Enterprise Systems have been argued to improve operations for over a decade now. As a matter of fact, one of the key reasons for the existence of Enterprise Systems is to achieve operational efficiency in the adopting organizations.

Many large organizations have adopted ERP systems and benefitted significantly from the operational efficiency they provide (Sumner 1999; Shang & Seddon 2002; Spathis & Constantinides 2003; Davenport 2004; Motiwalla & Thompson 2009). Further, a study conducted on 190 organizations implementing Enterprise Systems revealed that for adopting ERP and SCM systems, on average there is increase in profitability and stock returns (Hendricks et al. 2007).

Business value from enterprise systems: beyond improving operations

The motivation for the study is to go beyond the operational benefits of Enterprise Systems and explore how these systems can enable business value beyond operational efficiency. Given that Enterprise Systems were initially developed to provide operational efficiency, and are only recently being looked at for other ways of creating business value, there isn't much prior research in this area. A much-cited development in this area is the classification of benefits from Enterprise Systems by Shang and Seddon (2002), who identified the benefits from Enterprise Systems to be Operational, Strategic, Managerial, IT Infrastructural, and Organizational. This classification was again used by Staehr et. al (2012).

A review of the literature on Enterprise Systems revealed three commonly mentioned means (in addition to improving operations) by which Enterprise Systems can enable business value through:

a) Mergers and Acquisitions**,** as suggested by Gupta (2000), Grainger (2007), Mehta and Hirschheim (2007), and Weill and Ross (2009),

b) Innovation, as suggested by Rajagopal (2002), Bradford and Florin (2003), Swanson and Pang (2005) and King (2006) and Srivardhana (2007)

c) Strategic decision-making, as suggested by Bligh and Turk (2004), Spathis and Constantinides (2004), Rom and Rohde (2006), Goodhue et. al (2002) and Rigby and Ledingham(2004)

As there are not many studies discussing the different types of benefits from Enterprise Systems beyond operational efficiency, a step back was taken to look at the role of IT in general to enable value, especially beyond improving operations. The intention is to confirm the three means of creating business value identified above using studies on IT in general.

A detailed systematic review of literature was done to identify means (in addition to operational efficiency) in which IT, in general, can enable business value. Such **a** review (as summarized in Table 1 below) supported two common means through which IT enables business value:

a) innovation- new products/services and new processes and b) strategic decision making

Study	Means Of Creating Business Value With IT	IT Supports 'Innovation'?	IT Supports 'Strategic Decision Making'?
Sambamurthy and Zmud (1994)	• New products and services • Transformed business processes • Enriched organizational intelligence	Yes In 'New products and services' and 'Transformed business processes'	Yes In 'Enriched organizational intelligence'
Mooney et al. (1996)	• Automational • Informational • Transformational	Yes In 'Transformational'	Yes In 'Informational'
Weill and Broadbent (1998)	• **Infrastructural** • **Transactional** • **Informational** • **Strategic**	Yes In 'Strategic'	Yes In 'Informational'
Tallon et al. (2000)	• Customer relations • Suppliers relations • Sales and marketing • Production/operations • Product/service enhancement • Process planning and support	Yes In 'Product/service enhancement' and 'Production/operations'	Yes In 'Process planning and support'
Applegate et al. (2003)	• Assist auxiliary support • Support core	Yes In 'Innovate'	Yes In 'Support strategy of the

	processes • Support strategy of the firm • Innovate		firm'
Sambamurthy et al. (2003)	• Agility • Digital options • Entrepreneurial alertness	Yes In 'Agility' and 'Digital Options'	Yes In 'Entrepreneurial alertness'
Kohli and Grover (2008)	• Co-creating with partner organizations • Embedding IT into processes • Re-assessing and making decisions by information analysis	Yes In 'Embedding IT into processes'	Yes In 'Re-assessing and making decisions by information analysis'
Weill and Ross (2009)	• Operational performance improvements • Accelerated product/service innovation • Reorganization around customer oriented processes • Integration of mergers and acquisitions	Yes In 'Accelerated product/service innovation'	Yes In 'Reorganization around customer oriented processes'

Table 1: Means of Creating Business Value with IT: Summary of Key Models.

It may be noted that support for Mergers and Acquisitions as a means of creating value with IT was found in the study by Weill and Ross (2009) only. However, enabling Mergers and Acquisitions seems especially important in the case of Enterprise Systems, as a specialized variant of IT, as suggested by Gupta (2000), Grainger (2007), Mehta and Hirschheim (2007), Weill and Ross (2009) and Motiwalla and Thomson (2009). So this means was retained as a key means of creating business value with Enterprise Systems.

As a result of the review of studies on creating business value with IT in general, and Enterprise Systems in particular, it was found that 'innovation', 'strategic decision making', and 'mergers and acquisitions' are the three most commonly-discussed means of creating business value with Enterprise Systems.

However, it should be noted that there may be other means by which Enterprise Systems can enable business value by enabling international growth, organizational learning (Shang and Seddon 2002). However, these have not been mentioned by many other studies and are therefore not included in scope for further exploration.

IDENTIFYING KEY MEANS OF BUSINESS VALUE FROM ENTERPRISE SYSTEMS: A NEW FRAMEWORK

As discussed in the previous section and informed by the literature therein, four key means of creating business value from Enterprise Systems were identified:

    A. Operational Efficiency
    B. Mergers and Acquisitions
    C. Innovation (in products and processes)
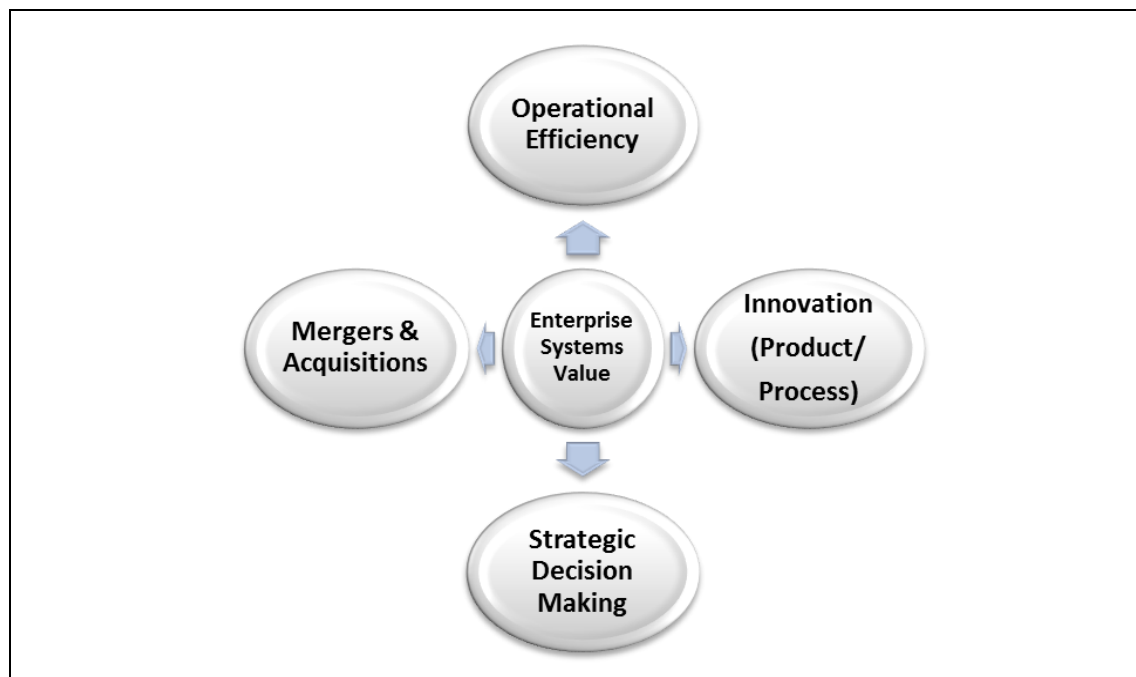   D. Strategic Decision Making

Figure 1: Four Key Means of Business Value from Enterprise Systems.

The choice of these four means of creating business value, as shown in Figure1, is primarily based on the works of Shang and Seddon (2002) and Weill and Ross (2009). This section explains the transitions of the constructs in the models of Shang and Seddon (2002) and Weill and Ross (2009) to the four constructs of the model proposed by this study.

Shang and Seddon (2002) listed a number of benefits that can be derived from Enterprise Systems and classified them into broad categories namely Operational, Managerial, Strategic, IT Infrastructural and Organizational benefits. The benefits in their 'Operational' category refer to things that form the basis for the idea behind item A (Operations) in the list above. The benefits in their 'Managerial' category refer to decision making and planning; this is the basis for the idea behind item D (Strategic Decision Making) in the list above. The benefits in their 'Strategic' category refer to things that these systems enable beyond improving operations like 'building business innovations'; this is the idea behind item C (Innovation - in products and processes) in the list above and 'supporting business alliances' ; this is the idea behind item B (Mergers and

Acquisitions) in the list above. However, this study does not explain the mechanism through which Enterprise Systems can achieve such benefits. Later, Weill and Ross (2009) argued that business opportunities can be created by IT, in general, in four main ways: 'Operational performance improvements' (the idea behind item A in the list above), 'Accelerated product and service innovation' (the idea behind item C in the list above), 'Reorganization around customer-oriented processes' (the idea behind item C in the list above), 'Integration of a merger or acquisition' (the idea behind item B in the list above). However, this work refers to IT in general, not particularly ES.

It may be noted that, the above four means of business value creation may not be comprehensive; there could possibly be other means of creating value with ES, like organizational learning and supporting worldwide expansion (Shang and Seddon 2002). However, the four mentioned in this proposed model are the most discussed and suggested means of creating business value with IT in general, and ES in particular, by several researchers as mentioned earlier.

Also, it is not the intention of this model to suggest that these four 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 four means, where 'enable' means facilitate, support or make easier.

Construct	Meaning
Operational Efficiency	Operational efficiency involves maximizing the use of resources and capabilities and incurring the minimum possible cost to deliver quality products and services to customers. This is measured using standard accounting measures like operating margin, stock turnover ratio, degree of operating leverage and so on.
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). They help a business entity grow rapidly in either a) its sector or location of origin, or b) a new field or new location, thus achieving inorganic growth.
Innovation	Innovation adds unique value for the customers, enables competitive advantage and generates value for shareholders (Drucker, 1985; Snyder & Duarte, 2003). The dimensions along which an organization can undertake innovation are product and process (King et al. 1994; Christensen, 1995; O'Sullivan & Dooley, 2009). **Product Innovation:** Product innovation can be said to be the development of new products, changes in design of established products, over time (Dougherty & Hardy, 1996) **Process Innovation:** Process innovation is 'the *critical* analysis and *radical* redesign of work flows and business processes to achieve *dramatic* improvements in important measures of performance' (Martinsons 1995 p.254)

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).

Table 2: Business Value Created using Enterprise Systems.

Firstly, the primary and the most common type of value ES enables is for the operations of the organizations to run more efficiently. Using Enterprise Systems, an organization can achieve an optimised, integrated, and informating platform as discussed in the previous sections. This platform makes them capable to run their operations/ business to achieve operational efficiency. In particular, this platform contributes to the following benefits that characterize/contribute to operational efficiency: reduction of time for processing transactions, reduction of data entry errors, reduction in stock-in-hand levels, improved delivery times and stock turnover, and overall decrease in total operating and administration costs (Sumner, 1999; Shang & Seddon, 2002; Spathis & Constantinides, 2003; Davenport, 2004). A study conducted on about 190 organizations implementing Enterprise Systems revealed that, for adopting ERP and SCM systems, on an average there is an increase in profitability and stock returns (Hendricks et al. 2007). Microsoft implemented SAP ERP and gained significant operational benefits like reduction of planning cycle (by 95%), low stock levels (up to 25%) and saved $18 Million USD. Nestle adopted SAP ERP to have common processes and structures across the firm, which in turn produced significant operational benefits like decreased inventory and distribution expenses leading to a significant increase in return on investment (ROI).The US army adopted ERP to synchronize institutional (acquisition, finance, HR, logistics) and operational army (war fighting, enterprise information mission area) with attainment of the goal of 'one army one enterprise' in mind (Motiwalla & Thomson, 2009). This leads us to the following proposition:

P1. Enterprise Systems enable adopting organizations to achieve operational efficiency

Secondly, it is proposed that Enterprise Systems can enable Mergers and Acquisitions by supporting the following aspect: Integration of people, processes and systems.

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:

P2. Enterprise Systems enable adopting organizations to undertake Mergers and Acquisitions

Thirdly, authors like Rajagopal (2002), Bradford (2003), Swanson and Pang (2005) and King (2006) have suggested the concept of innovating with Enterprise Systems. However, they study the implementation of such systems as an innovation by itself; they have not said much to address the new opportunities these systems can create through new products and processes. Shang and Seddon (2002) in their classification of the benefits derived from Enterprise Systems have mentioned building business innovations and generating product differentiation as benefits in the 'Strategic' category. However, this has not been discussed to much depth. Srivardhana (2007) studied how Enterprise Systems can enable innovation and found that these systems can both enable and hinder process innovation - a rather interesting finding. So there is an opportunity to explore this phenomenon further. 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 &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 analysing 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. NAB claims that its Oracle Fusion Middleware-based core-banking program enables it to offer new products like online banking services. This product is available from only one of its key competitors - CBA, which again uses another Enterprise System SAP's core-banking engine (Tay, 2012a). 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 & Thomson, 2009). Re-engineering business processes radically to build new processes can be made possible using Enterprise Systems. 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 (Bhattacherjee, 1999). This leads us to the following proposition:

P 3. Enterprise Systems enable adopting organizations to undertake innovation

Fourthly, researchers have also begun to explore the role of Enterprise Systems in strategic decision making. Davenport (2000) suggests that the key strategic areas in which Enterprise Systems can play an important role are the sense-and-respond business models, globalization and in extending the value chain. CRM systems have been said to have strong strategic potential for increasing market share by using them to manage customers through better promotion of products/services, better customer service and better identification of profitable customers (Bligh & Turk, 2004). A survey revealed that ERP systems enable profitability analysis by business segments; this analysis assists in strategic decision making by top management members (Spathis & Constantinides, 2004). The Data Warehouse and Business Intelligence technologies that are now a part of every major Enterprise System are useful for Enterprise Performance Management.

These tools translate the business strategy into Key Performance Indicators and analyze them to reveal how the organization is performing (Bose, 2006). 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. Goodhue et. al (2002) and Rigby and Ledingham(2004) suggest that CRM systems enable a better understanding of the customer, a key stakeholder in strategic decision making activities for any organization. This leads us to the following proposition:

P4. Enterprise Systems enable adopting organizations to make strategic decisions.

EMPERICAL TESTING OF THE NEW FRAMEWORK

Methodology

A major concept to be defined here is the unit of analysis. This defines the boundaries of a research study (Pare 2004). Since this research involves the use of Enterprise Systems in organizations, the unit of analysis is organizations. However, a selection criterion was applied to choose the case-study sites. This is as follows:
* Large firms with at least $500 million plus USD yearly revenue
* Successfully 'gone-live' with ERP and/or CRM from any leading vendor
* Post-shakedown phase (i.e. 6-12 months after a major release)

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).

Sample Selection

For the purpose of this research, we were looking for cases where the adoption of Enterprise Systems was a success. This is because any business value can be only realized from successful implementation of such systems, not failed ones. To this end, a pool of data was found in the form of 'success cases' of firms that have adopted ERP/ CRM Systems. These 'Success cases' are real accounts of business transformation stories of customer organizations enabled by SAP ERP and/or CRM systems (including in-built business intelligence technologies). These were available online from the leading vendor of Enterprise Systems, SAP, and have been endorsed by the client firms. These stories contain the contact details of the organizations as well as their top management members, along with direct quotes from their interviews. These 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 using the criteria described in the 'Unit of Analysis' section. 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.

Content Analysis

Analysis of the content of these success cases combines some of the strengths of a survey and a case study. Being reasonably content intensive, vendor-provided success cases provide some insight to each user organization, as is possible with case studies. In addition, the use of a large number of cases provides a means to obtain information across different industries in different parts of the world, as is done in a survey. For this research, the success cases thus obtained were subjected to content analysis. The success cases were downloaded and printed out in hard copies. Each success story was scanned and reviewed, one by one, to find evidence for the four propositions of the proposed framework. Wherever found, such evidence was marked and annotated using a coding scheme used for this purpose.

As an illustration of the content analysis done, in the case of Air Products, a quotation was found stating "*The project has been incredibly successful in eliminating the costs associated with our legacy systems.*" This was stated by (Eric Hess, Applications Service Manager, Air Products. This was marked as evidence as evidence for '*Proposition P1: Enterprise Systems enable adopting organizations to achieve operational efficiency'*. Again, in another case of Asian Paints, a quotation was found stating "*SAP CRM transformed our organization and allowed us to expand into the services business*" This was stated by Deepak Bhosale, Senior Manager, Asian Paints. This was marked as evidence as evidence for '*Proposition P3: Enterprise Systems enable adopting organizations to undertake innovation'*. A similar approach was followed by analysing each of the 100 stories, one by one, looking for evidence for each of the four propositions P1 through P4.

Reliability of the Data

Though not collected first hand by the researcher, these multiple stories provide verifiable data for review and analysis. Since these success 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 success cases are from the most reputed vendor of Enterprise Systems (SAP) and are publicly available; hence they bear little risk of being false
* These success cases contain the contact details of the organizations as well as their top management members with quotes from their interviews for verification

Moreover, use of vendor published success cases has been used widely in prior research on Enterprise Systems like the much cited work by Shang and Seddon (2002). This research methodology has been proved to be very useful in the area of Enterprise Systems research where the data is collected from publicly available documents that contain the insight and experience of the adoption of such systems from the client organizations' perspectives.

Findings from the Analysis

This section reports on the findings of the analysis of the 100 success cases. This is divided into 2 parts. Part 1 shows a list of illustrative extracts of evidence from the individual success cases to support the 4 kinds of benefits proposed from Enterprise Systems. Part 2 presents a summary of the evidence found from all the 100 success cases to support the 4 kinds of benefits from Enterprise Systems.

Part 1:   Illustrative Extracts of Support for the Propositions

The next 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 success cases.

P1. Enterprise Systems enable adopting organizations to achieve operational efficiency
➤ "The project has been incredibly successful in eliminating the costs associated with our legacy systems." (Eric Hess, Applications Service Manager, Air Products) ➤ "SAP CRM is definitely a quality booster. We've realized [resource productivity] due to better reporting, automation, and consistency of our processes. We've achieved powerful productivity benefits." (Harish Balan, Director, Customer Support Centre, India, Synopsys) ➤ "Bosch Thermotechnik GmbH was able to reduce the number of planners needed to coordinate routes from 10 to 5, schedule service jobs more appropriately, and minimize overtime hours. Invoicing, payroll accounting, spare-parts procurement, and reporting are integrated with processes supported by the SAP ERP application, improving efficiency and visibility into operations. The system enabled improved technician productivity and a 50% reduction in the average amount of time needed for order handling and technician scheduling." (Document Extract) ➤ "We are able to provide our internal users – both sales and management – with efficient, modern tools [in SAP] so they can do their jobs more effectively." (Dave Rolston, Vice President of E-Business, Medline Industries Inc.)
P2. Enterprise Systems enable adopting organizations to undertake mergers and acquisitions
➤ "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)
P3. Enterprise Systems enable adopting organizations to undertake innovation
➤ "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) ➤ "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.) ➤ "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)
P4. Enterprise Systems enable adopting organizations to make strategic decisions
➢ "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)   ➢ "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)

Table 3: Illustrative Extracts for the Propositions.

Part 2: Summary Statistics from the Full Sample

The summary statistics for evidence of support for the four propositions from the full sample is presented in the table below.

Proposition	No. of success cases (out of 100) with evidence of support
P1. Enterprise Systems enable adopting organizations to achieve operational efficiency	100
P2. Enterprise Systems enable adopting organizations to undertake mergers and Acquisitions	23
P3. Enterprise Systems enable adopting organizations to undertake innovation	66
P4. Enterprise Systems enable adopting organizations to make strategic decisions	67

Table 4: Summary of Evidence from the Full Sample.

DISCUSSION

Results from analysis of all 100 success cases are summarized in the above table. To the best of the knowledge of the author, there is no established benchmark (like Nunnally's test) available in the research method employed for this study to determine definitive numbers as heuristics. However, the fact that all the propositions are supported by at least one success story shows that some evidence of support is found for the model. Also, it may be noted that the argument is that Enterprise Systems *can* enable business value creation one or more of the above mentioned four means; it is **not** claimed that they *always will*. Therefore, evidence of support for the propositions found in even one success story demonstrates the validity. Further, it can be said that higher the number of success cases with evidence of support for the propositions of the model, the stronger the support for the aforementioned four means as the key means for creating Enterprise Systems-enabled business value.

As shown in the above table, the results show that these systems enabled Operational Excellence in all the success cases, innovation in product and/or process in 66% of the success cases, better strategic decision making in 67% of the success cases, and mergers and acquisitions in 23% of the success cases. Because all totals in the table except for p2 are above 50%, the evidence of support may be described as strong.

Proposition P2 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 P2 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 as a key means of business value from Enterprise Systems.

This study empirically tested and found evidence to support the claims that were made about the four means of business value creation as identified from the literature based on the works of several researchers like Gupta (2000), Shang and Seddon (2002) Rajagopal (2002), Bradford and Florin (2003), Bligh and Turk (2004), Spathis and Constantinides (2004), Rigby and Ledingham (2004), Rom and Rohde (2006) Grainger (2007), Mehta and Hirschheim (2007), and Weill and Ross (2009).

Firstly, it was found that enterprise systems support the creation of business value for the adopting organizations by enabling operational efficiency. This is in line with the findings of the studies by several researchers (Sumner, 1999; Shang & Seddon, 2002; Spathis & Constantinides, 2003; Davenport, 2004).

Secondly, it was found that enterprise systems support the creation of business value for the adopting organizations by enabling mergers and acquisitions. This is confirmation of the suggestions, but often without empirical evidence, found in studies by Gupta (2000), Grainger (2007), Mehta and Hirschheim (2007), and Weill and Ross (2009).

Thirdly, it was found that enterprise systems support the creation of business value for the adopting organizations by enabling innovation. This is a step forward to validate and confirm the

proposals and sometimes mixed findings about the ability of Enterprise Systems to innovate, as found in the studies by by Rajagopal (2002), Bradford and Florin (2003), Swanson and Pang (2005) and King (2006) and Srivardhana (2007).

Fourthly, it was found that enterprise systems support the creation of business value for the adopting organizations by enabling strategic decision making. Again, this finding confirmed the strategic potential of enterprise systems, as suggested by Bligh and Turk (2004), Spathis and Constantinides (2004), Rom and Rohde (2006), Goodhue et al. (2002) and Rigby and Ledingham (2004).

CONCLUSION

This paper reports on an investigation on the potential of Enterprise Systems (ES) in enabling business value creation along different means and dimensions. Following a literature review on the benefits of Enterprise Systems, a new framework was proposed identifying four key means through which Enterprise Systems create business value. The research question posed earlier in the paper was answered by the framework: Enterprise Systems can enable business value creation through four key means: operational efficiency, mergers and acquisitions, innovation (in product and process) and strategic decision making. This framework was tested using content analysis of secondary data and reasonably strong evidence of support was found for the framework.

The key contribution of this paper is that it extends knowledge about the different means of business value from Enterprise Systems. This is a strong contribution, given that the literature on benefits of Enterprise Systems primarily concentrates on operational efficiency. While there have been attempts to identify non-operational benefits from Enterprise Systems recently, such claims are relatively scarce, isolated in nature, and often not supported by sufficient empirical evidence. This paper identifies this gap and addresses them in two ways. Firstly, it posits knowledge claims by identifying three additional means (other than operational efficiency) by which Enterprise Systems can create business value. Secondly, the paper validates and confirms these knowledge claims by testing them using real-life cases of Enterprise Systems adoption. It was found that the results support the four key means of business value from Enterprise Systems to be valid in majority of the cases studied.

The implication of this paper for future research is prominent. This paper generates new questions for further research: Other than the ones mentioned in this paper, what can be other means through which Enterprise Systems can create more business value? Also what is the mechanism through which such value can be realised? Such research can open up many possibilities for organizations adopting Enterprise Systems to get more Return on Investment from their systems and compete better in the market.

This paper also has implications for practice in the sense that it identifies the different kinds of business value practitioners adopting Enterprise Systems can expect from their investments.

The primary limitation of this study is that it is a test based on content analysis of secondary data. Further research is required to test the model rigorously through a survey. Details of such a study, which is currently underway, will be reported in a later paper.

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