Enabling Strategic Transformations with Enterprise Systems: Beyond Operational Efficiency

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Enabling Strategic Transformations with Enterprise Systems: Beyond Operational Efficiency

Research-in-Progress

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Abstract

The last few decades have seen the widespread adoption of large-scale, integrated, packaged software suites collectively called Enterprise Systems. However, most studies done so far have largely focused on the operational efficiency achieved by using these systems. This paper reports on research-in-progress that seeks to explore the strategic potential of Enterprise Systems to enable business transformations. In doing so, a new model is proposed that places the emphasis on the potential of Enterprise Systems to achieve innovation and reshape business strategy, rather than merely focusing on operational benefits. This model proposes that Enterprise Systems, when used to integrate, optimise and informate, can help firms achieve alliance innovation, process innovation and reshaped business strategy. The paper also provides preliminary empirical evidence that supports the propositions. This model will be tested further through primary case studies and a survey. This research, once completed, will assess the strategic role of Enterprise Systems in enabling business transformations beyond operational benefits.

Keywords: Enterprise software/systems, Strategic value of IT/IS, Information Technology innovation, Organizational transformation
Introduction

Information Technology has become an integral and indispensable part of the modern corporate world. In the past two decades, a variant of such technology, called ‘Enterprise Systems’, has achieved widespread adoption in large firms and increasingly in small-to-medium-scale businesses. Enterprise Systems (ES) can be defined as large-scale, packaged, software systems that can be used to streamline and integrate all the business processes of a firm and improve information and knowledge levels within the firm as well as with its supply chain partners and other stakeholders. In modern times, the phrase includes a number of systems like Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) Supply Chain Management (SCM) and so on. However, for this research, the application of the term ‘Enterprise Systems’ is limited to ERP and/or CRM Systems (with built-in Business Intelligence technologies), given their clear dominance in the market.

Putting these systems in place involves investments of millions of dollars and significant periods of time and human effort. Since most large firms have already implemented Enterprise Systems, many firms today are seeking get more out of these systems than just improving ‘operational efficiency’, i.e. the speed and accuracy of carrying out the day-to-day operations in organizations. In the modern, competitive, corporate world, this is far from sufficient. Enhancing competitive position in the market has been proposed to be a function of two factors: (a) cost of providing goods and services and (b) customers’ willingness-to-pay for these (Ghemawat and Rivkin 2006). Firms need to minimize the first factor or maximize the second, or both, to compete better than their rivals. These requirements have led to the notion of ‘business transformation’: to align people, processes and technology intimately to the strategy of the organization, and/or to develop new strategies. It involves reinventing the organization to create new structure, processes and practices and even strategy to ensure long-term survival. It enables an organization to create business value by a substantial change in the markets and customers a firm caters to and the products and services it offers to them, as well as in internal aspects such as structure and systems (Parker 1996; Laszlo and Laugel 2000; Stockport 2000). Clearly, transformation initiatives extend well beyond a focus on operational benefits only.

Technology, and especially Information Technology, has been said to have the potential to play a significant role in such initiatives. Information Systems-enabled transformation is said to be a subtle interplay of technology, actors, organizational elements and tasks (Lyytinen and Newman 2008). Adopting Enterprise Systems and exploiting these systems for business transformation initiatives to create business value have recently become a trend in the corporate world. This has led to the growth of a number of large, multi-national, blue chip ‘Consulting’ firms that claim to carry out ‘business transformation’ for their clients enabled by the adoption of Enterprise Systems. Furthermore, almost every vendor of Enterprise Systems claims to enhance and equip their software to meet business objectives and enable these systems to play a strategic role to aid the adopting organizations contend better in the marketplace (Seddon 2005). But, in spite of the claims by vendors and consultants, there is very limited research that actually explores the role of Enterprise Systems (especially beyond the operational benefits from it) as an enabler of business transformations. This leads to the research question:

*How can the adoption of Enterprise Systems in large organizations enable strategic business transformations?*

This is to be studied for firms with at least annual revenue of $500 million, in any industry in any part of the world that have invested in Enterprise Systems (ERP and/or CRM Systems) from a leading vendor (e.g., SAP, Oracle) with a view to achieving strategic goals through organizational-transformation initiatives. Also, these firms should be past the ‘shakedown’ period after a successful ‘go-live’, as defined by Markus and Tanis (2000).

The remainder of the paper reviews some key studies, proposes a new theoretical model of Enterprise Systems-enabled business value creation, presents results of a preliminary test of that model, and discusses the next steps towards the completion of the research.
Review of Key Studies

Benefits from Enterprise Systems: Enterprise Systems have been reported to deliver a wide range of business benefits. These include (1) optimization of business processes; (2) better inventory management and lower stock-in-hand (Davenport 2000; Al-Mashari 2003; Spathis and Constantinides 2003; Siau and Messersmith 2003; Botta-Genoulaz and Millet 2005; Chand et al. 2005; Rikhardsson and Krammergaard 2006); (3) enforcing a standard structure and assisting in the coordination of different interdependent business units in an organization (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; Kelle and Akbulut 2005; Volkoff et al. 2005; Karimi et al. 2007); (4) availability of good quality information in real time that leads to better decision making and improving customer satisfaction and retention (Davenport 2000; Murphy and Simon 2002; Spathis and Constantinides 2003; Botta-Genoulaz and Millet 2005; Chand et al. 2005; Rikhardsson and Krammergaard 2006; Harley and Wright 2006; Motiwalla and Thomson 2009).

Shang and Seddon (2002) classified the benefits derived from Enterprise Systems into 5 categories: Operational, Managerial, Strategic, Organizational and IT Infrastructural benefits. Sammon et al. (2003) extended this to state that while classical ERP functionality reap operational and IT infrastructural benefits, the BI type technologies now bundled with ERP enable the managerial and strategic benefits. Another important addition to the literature is a model by Davenport et al. (2004), which identifies the primary drivers of organizational benefits from Enterprise Systems as being ‘informate’, ‘integrate’ and ‘optimize’. This model is used to build the proposed model and hence discussed in the next section in detail. This model was further supported with empirical testing by Seddon et al. (2010).

Achieving benefits from Enterprise Systems often involve making a choice between the so-called ‘best practices’ embedded in the Enterprise systems and the practices of the adopting organization. Sia and Soh (2007) identify that there could be two types of misalignments between the ‘best practices’ in the systems and the processes in the organization: a) voluntary and b) imposed. In making choices, they suggest that the adopting organization should align its processes to the ‘best practices’ for the former, and customise the package for the latter. However, sometimes the term ‘best practice’ can be subjective; it is defined by actors with power and authority (Wagner, Scott and Galliers 2006). In organizations with diverse user groups and varied culture, a one-size-fits-all approach of ERP systems to organizational processes will not be helpful; often the ‘best practices’ may need to be negotiated in the post go-live phase to remove organizational resistance (Wagner, Newell and Picoli 2010).

The adoption of Enterprise Systems typically involves changes in organizational data and systems functionality, but more importantly also changes to roles, routines and controls within the organization (Volkoff, Strong and Elms 2007). Changes in both the technology itself and the work processes enabled by the technology need to occur in concert to derive the most benefits from Enterprise Systems (Robey, Ross and Boudreau 2002; Ash and Burn 2003; Berente et al. 2008).

The realization of benefits is also subject to overcoming any potential organizational inertia following Enterprise Systems implementation. Such inertia needs to be addressed over time through the extended use of the system post-implementation; user participation is crucial (Scott and Wagner 2003; Boudreau and Robey 2005). It may be noted that often an integrated and standardised or vanilla ERP induces better organizing and better organizational learning (Fenema et al. 2007).

Strategic Potential of Information Technology/Systems: Various frameworks have been suggested for explaining how IT can contribute ‘strategic’ benefits to an organization. Gouillart (1995) argues that Information Technology plays a key role in ‘Restructuring’ and ‘Revitalizing’ organizations. Michael Porter’s Industry and Competitive Analysis and Value Chain Frameworks have been used to explain what role Information Systems can play to provide competitive advantage (Applegate et al. 1996). The Strategic Grid Framework devised by Warren McFarlan identifies four roles that IT plays in organizations: assist auxiliary support to running the firm; support core processes of the firm; support strategy of the firm; and innovate and use increasingly for strategic goals (Applegate et al. 2003). Finally, Weill and Ross (2009) have proposed a model that includes operational excellence, new products and services, and mergers and acquisitions as key strategic endeavors that are enabled by Information Technology.
The strategic potential of Enterprise Systems: As a particular kind of IT, Enterprise systems may also be able to contribute strategic benefits to adopting organizations. Davenport (2000) suggests that the key strategic areas in which Enterprise Systems can play an important role are sense–and-respond business models, globalization, and in extending the value chain. In a study on the use of Enterprise Systems after implementation using a stage maturity model, Holland and Light (2001) concluded that adopting organizations ultimately aim to use ERP for strategic purposes. This strategic potential of ERP systems was supported by Hayes et al. (2001). Willis and Brown (2002) propose that after implementing Enterprise Systems, firms should continuously strive to extend the system and integrate it with others and better reengineer the processes. These concepts were complemented by studies which concluded that an alignment of the Enterprise Systems with the business strategy was a key ingredient for realization of value from Enterprise Systems (Grant 2003; Somers and Nelson 2003). Other studies have reported that ERP and/or CRM systems assist in realizing the business strategy- be it cost leadership, differentiation or growth through mergers and acquisitions (Gupta 2000; Al-Mashari 2003; Bligh and Turk 2004; Ragowsky et al. 2005; Teo et. al 2006; Hendricks et al. 2007; Motiwalla and Thomson 2009).

A significant body of research literature exists in the area of Enterprise Systems. However, literature on the role of Enterprise Systems beyond operational efficiency outcomes is sparse. There is also little research on the drivers of business value from Enterprise Systems and the forms of business value derived from such systems. We contend there is a need for research to explore the potential of Enterprise Systems to achieve business value outcomes beyond operational efficiency.

Proposed Model

In an attempt to answer the research question mentioned earlier, a new model is proposed to explain how Enterprise Systems can enable business value creation (beyond operational efficiency) in strategic business transformations in large organizations. In other words, what are the drivers of business value using Enterprise Systems and what is the value (beyond operational efficiency) created in business transformation initiatives. The figure below depicts the proposed model, describing how the drivers of business value are related to the business value created using Enterprise Systems.

![Figure 1. The relationship of the drivers of business value and the business value created](image)

Drivers of business value from Enterprise Systems: As a part of transformation initiatives, organizations invest in Enterprise Systems. With an appropriate Enterprise System licensed, the organizations embark on ‘implementation project(s)’ to employ this system successfully to do the following, as suggested by Davenport (2004). This has been supported by testing with empirical data (Seddon et al. 2010)
Table 1. Drivers of Business Value using Enterprise Systems

<table>
<thead>
<tr>
<th>Integrate</th>
<th>Harmonize the data, processes and systems within the organization as well as beyond the boundaries, extending to customers, suppliers and other stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimise</td>
<td>Standardize the processes (both front-end/customer facing and back-end/administrative) by aligning them with best practices or enhance them to meet the strategic needs that yield competitive advantage</td>
</tr>
<tr>
<td>Informate</td>
<td>Provide access to real-time data and the capability to analyze the internal organizational performance and the behavior of external stakeholders like customers and suppliers; and aid decision making at different levels of management including at organizational/strategic levels</td>
</tr>
</tbody>
</table>

**Business value created using Enterprise Systems**: Several studies, as mentioned in the ‘Key Studies’ section show that after successful ‘go-lives’ of projects and post the ‘shakedown’ period (Markus and Tanis 2000), this Enterprise Systems-enabled platform enables operational efficiency in the adopting organizations. However, this proposed model goes beyond this and suggests that this Enterprise Systems-enabled platform also create value in business transformation initiatives by achieving the following:

<table>
<thead>
<tr>
<th>Alliance Innovation</th>
<th>Takeover/acquire or merge with other organizations, or consolidate different business units to form a new organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Innovation</td>
<td>Design and develop new business processes or completely redesign existing business processes</td>
</tr>
<tr>
<td>Reshaping Strategy</td>
<td>Evaluate existing corporate performance and identify, assess and evaluate at new business opportunities</td>
</tr>
</tbody>
</table>

This approach is aligned to a model of creating business value with IT proposed by Weill and Ross (2009). This proposed model (Figure 1) extends this to the special case of IT, i.e., Enterprise Systems and attempts to establish relationships between the drivers of Enterprise Systems-enabled business value, i.e., Integrate, Optimise, Informate, and the business value created through Process Innovation, Alliance Innovation and Revision of Strategy. The section below discusses the rationale and formulates some hypotheses (marked by solid arrows in Figure 1), based on logic and evidence from past studies, which are to be tested empirically.

An integrated data and process framework is a boon to firms when they attempt mergers and acquisitions. Having such integrated systems such as ERP Systems in both the acquirer and the acquired firm, or even in one of them, smoothens out the process of integrating thousands of systems across two organizations, which is one of the most complex, time-consuming, error-prone and expensive tasks involved in mergers and acquisitions. ERP systems adopted by manufacturer firms have been shown to assist in quickly integrating mergers and acquisitions (Gupta 2000; Grainger 2007). In other words, a greater number of integrated components and a common set of shared data would help organizations to merge the data and systems easily when acquiring or merging with other organizations. This suggests that a high degree or extent of integration of data and system components within the organization supports takeover or merger initiatives. This leads to:

**Hypothesis 1**: The more that the adopting organization uses their Enterprise Systems to integrate, the better they can achieve Alliance Innovation.

Process Innovation can be accomplished by creating new processes or wholly redesigning existing processes (Swanson and Pang 2005). This can be in (a) operational/back-end processes by using the so-called ‘best practices’ of the Reference Models in such ERP Systems, (b) front-end/customer-service processes by implementing the marketing-sales-service cycle of CRM systems. Enterprise Systems assist in completely redesigning business processes or inventing new processes using their ‘optimised’ built-in best practices. These best practices are developed over the years from processes of high performance organizations in different industries. This suggests that the alignment of many of the business processes of the organization to ‘best practices’ of Enterprise Systems...
leads to business process reengineering. This results in many completely new, innovative processes being introduced into the organization:

_Hypothesis 2: The more that the adopting organization uses their Enterprise Systems to optimise, the better they can achieve Process Innovation_

Exploitation of IT/IS capabilities in general to play a role in formulating business strategies was found to be useful by several researchers (Applegate et. al. 1996; Goldsmith 1991; Robson 1997). Kearns and Lederer (2000) summarize such studies and propose a useful model of interaction of Information Systems Planning (ISP) and Business Strategy/Planning (BP) wherein both are shown to positively impact each other. Enterprise Systems, in particular, when used to informate using the high quality information available and the specialized analytics capability provided with the business intelligence technologies, assist in profitability analysis (Spathis and Constantinides 2004). This opens up several opportunities to consider which were not available for analysis at the time of formulating the business strategy prior to having the system. Components like SAP’s Strategic Enterprise Management (SEM) suite assist in the actual strategic management process, including creation/recreation of the strategy. It can therefore be argued that the availability of quality information in real-time and the tools to analyze it in-depth supports strategic decision-making. In other words, having access to an extensive amount of unified data and many built-in reports as well as easy-to-use tools to build more analytical reports gives the management a greater ability to make more informed decisions about the current position and the desired future direction of the organization. This leads to:

_Hypothesis 3: The more that the adopting organization uses their Enterprise Systems to informate, the better they can revise their business strategy_

Also, there are two other relationships (marked by dotted arrows in Figure 1) that can potentially be valid. The ‘integration’ of data and processes with suppliers and retailers can lead to a innovating a new supply chain process. Thus there is a potential link between ‘Integrate’ and ‘Process Innovation’. Specialized tools like SAP’s Business Planning and Simulation (BPS), Corporate Performance Monitoring (CPM) in ERP packages contain practices to help in ‘optimising’ the strategic management process. So it could be possible that ‘Optimise’ assists in ‘Reshaping Strategy’. However, these relationships have not been studied yet and hence are not discussed here; they will be explored in the future.

**Testing the Model: A Preliminary Empirical Study**

**Sample Selection**

To conduct a preliminary test of the proposed model shown above, a sample of 94 cases of large firms from across the world that have adopted an Enterprise System from the market leader vendor SAP was found online. Some of these cases were short (two pages or so) and some much longer and detailed (15-16 pages). These cases can be found at: [www.sap.com/solutions/business-suite/erp/customers/index.epx](http://www.sap.com/solutions/business-suite/erp/customers/index.epx) and [www.sap.com/solutions/business-suite/crm/customers/index.epx](http://www.sap.com/solutions/business-suite/crm/customers/index.epx). These cases were endorsed by the client firms and published as business transformation cases of customer organizations enabled by SAP ERP and/or CRM systems (including in-built business intelligence technologies). Although published by the vendor, these cases contain contact details of the organizations as well as its top management members, with quotes from their interviews, and can therefore be treated as credible information provided by the client organizations themselves. These cases served as secondary data (Jarvenpaa, 1991) for the preliminary test of the proposed model. Evidence to support the model is provided in two parts: Evidence of Causality and Evidence of Association.

**Evidence of Causality:** A few of these cases from the above sample are very briefly discussed below as an illustration to provide evidence of the causality of the relationships shown in the hypotheses.

**Case for Hypothesis 1:** Canadian National Railway Company (CNRC) is one of the earliest freight railroads around the globe and a leader in the North American rail industry, based in Montreal, Canada. Its annual revenue in 2006 was CAD 7.7 billion. The company now spans across Canada, mid-America and Mexico.
CNRC made a strategic decision to adopt ERP to address the following key themes: assist its growth strategy through mergers and acquisitions of 4 other railways, improve information levels and analytics capability for operational efficiency and assist in innovation and agility. The organization got SAP ERP and Product Lifecycle Management (PLM) suites implemented from 1999 to 2005. CNRC used the system for integrating systems and sharing information with its 22,250 employees widely dispersed across North America.

“CN has integrated and consolidated the functionality and data from over 100 computer applications into one seamless SAP platform”. (F. Grisby, Senior Vice-President and CIO)

SAP ERP clearly assisted in consolidating the IT systems that resulted from the growth strategy of CNRC- Mergers and acquisitions. The CN Mergers with Illinois Central in 2001, Wisconsin Central in 2003, Great Lakes Transportation in 2005 and British Columbia Rail in 2005 were supported by the ES platform. CNRC’s profits rose 34% to CAD 2 billion in 2006. Thus, Integrating using Enterprise Systems was a causal enabler of Alliance Innovation.

**Case for Hypothesis 2:** Energen Corporation is a diversified energy holding company headquartered in Birmingham, Alabama with annual revenue of USD 1394 million. It has two lines of business: development of domestic, onshore natural gas, oil, and natural gas liquids reserves; and natural gas distribution in central and north Alabama. It implemented SAP ERP and Human Capital Management solution.

The system was used to achieve streamlined payroll processing and achieve process innovation by completely automating W-2 processing. In addition, Energen can now run payroll simulations. Energen conducted a detailed engagement to map out all the organizational business processes to optimise them.

“With SAP software, we have been able to increase our payroll processing efficiency. Reconciliations are significantly smoother. Also, the system uptime has improved as access is available during payroll runs.” (Willie Shepherd, Manager of Payroll)

In addition, with enhanced reporting capabilities, Energen can now automate and integrate safety reporting (OSHA 300) and drug testing.

“Without it [SAP software], changing any business process would have been extremely difficult.” (Brunson White, Vice President and CIO) Thus, Optimising using Enterprise systems was a causal enabler of Process Innovation.

**Case for Hypothesis 3:** Pick n Pay Group is a market-leading retailer in South Africa and operates hypermarkets, franchise stores, supermarkets, convenience stores, and clothing stores with annual revenue of 3.5 billion Euros. The firm adopted SAP for Retail, the SAP ERP and the SAP Net Weaver Business Warehouse.

The SAP Business Suites enabled quicker access to a deeper level of detail in general ledger, simpler and real-time ledger analysis, and query resolution. Financial personnel can access in-depth general ledgers, drill down for better query resolution and analysis, and also analyse the regional ledgers online in real time. Simultaneously, stores can instantly view details of their actual expenditure.

It also enabled the top level managers to react quickly to changes in the competitive markets. Finally, the retailer has the agility and flexibility to handle dynamic business needs and pursue strategic initiatives, like the opening of a chain of convenience stores.

“With SAP software as the foundation of our business system environment, we can pursue the business opportunities that distinguish us from the competition and allow us to be more responsive to customers.” (Bronwen Rohland, Director of Strategy, Information Systems, and Supply Chain & Sustainability) Thus, Informating using Enterprise systems was a causal enabler of reshaping the business strategy.

**Evidence of Association:** A survey-like study using all the 94 cases in the aforementioned sample was done to assess the extent of statistical association between the dependant and independent variables of the hypotheses. A 4-point scale (0-3) was designed to measure the strength of evidence of the variables of the model in the sample. The scoring rules were as follows:
Table 3. Scoring Rules

<table>
<thead>
<tr>
<th>Score</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No evidence (no mention of any ideas associated with the construct)</td>
</tr>
<tr>
<td>1</td>
<td>Limited Evidence (vague mention)</td>
</tr>
<tr>
<td>2</td>
<td>Significant Evidence (good indication from the background)</td>
</tr>
<tr>
<td>3</td>
<td>Extensive Evidence (clearly mentioned as excerpts from interviews/text OR clearly implied)</td>
</tr>
</tbody>
</table>

The cases were analysed, one at a time, by the first author to assess the strength of evidence of each variable (e.g.: Integrate, Alliance Innovation). Quotations from managers of the client firms as well as text and numbers in the body of the cases were searched for evidence and marked. For example, in the Canadian Railways case, as illustrated by the quotes provided in the previous section, and other such evidence, a score of 3 was given to the construct ‘Integrate’ for that case. Similarly, for each of the 94 cases, a score from 0 to 3 was assigned to each of the six variables in the model using the rules for scoring shown in Table 3. This provided a dataset (as shown in Table 4) as the base for quantitative analysis to test the model.

Table 4. Sample Extract of the Dataset

<table>
<thead>
<tr>
<th>CASE</th>
<th>INT</th>
<th>OPT</th>
<th>INF</th>
<th>PI</th>
<th>AI</th>
<th>RESTRAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pick N Pay</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>0.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Energen</td>
<td>0.00</td>
<td>3.00</td>
<td>3.00</td>
<td>2.00</td>
<td>0.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Canadian Railways</td>
<td>3.00</td>
<td>2.00</td>
<td>3.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Synopsys</td>
<td>3.00</td>
<td>3.00</td>
<td>3.00</td>
<td>0.00</td>
<td>3.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Bentoe Group</td>
<td>3.00</td>
<td>2.00</td>
<td>3.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Coca Cola Bottling</td>
<td>3.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Digitel GSM</td>
<td>2.00</td>
<td>3.00</td>
<td>3.00</td>
<td>0.00</td>
<td>0.00</td>
<td>3.00</td>
</tr>
<tr>
<td>Lennox</td>
<td>3.00</td>
<td>3.00</td>
<td>0.00</td>
<td>2.00</td>
<td>0.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Francotyp Postalia</td>
<td>2.00</td>
<td>2.00</td>
<td>3.00</td>
<td>3.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>


Analysis of Data: From the dataset obtained as shown by the extract in Table 4, Spearman’s Correlation Coefficients (\(\rho\)) between the respective independent variables (Integrate, Optimise and Informate) and dependant variables (Alliance innovation, Process innovation, Reshaping Strategy) as per the hypotheses were calculated. As there is no dependant variable shown to be affected by multiple independent variables, there was no need to do a multi-variate analysis of the data. The results of these calculations are shown below:

Table 5. Evidence of Relationships of the Model

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Independent Variable</th>
<th>Dependant variable</th>
<th>Spearman’s Correlation Coefficient ((\rho))</th>
<th>Significance: (p) Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Integrate</td>
<td>Alliance Innovation</td>
<td>0.26</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>Optimise</td>
<td>Process innovation</td>
<td>0.37</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>Informate</td>
<td>Reshaping Strategy</td>
<td>0.29</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Discussion of Results

The significant (\(p<0.01\)) positive correlation coefficients, as shown in Table 5, between the relevant variables of the model, supported the three hypotheses shown in Figure 1. In particular, the results supported the following: the more the firms integrate using Enterprise Systems, the better the Alliance Innovation achieved (H1); the more the
firms optimise using Enterprise Systems, the better the Process Innovation achieved (H2); the more the firms Informate using Enterprise Systems, the better the strategy reshaped (H3). These correlation figures provided evidence of association between the constructs of the hypotheses, not of causality. However, the causality of the hypothesised relationships is supported by the case extracts as shown in the prior section titled ‘Evidence of Causality’. Thus this preliminary study provided evidence for both causality and association between the hypothesised constructs of the proposed model.

Limitation

The data reported in this paper came from “customer stories” published by an Enterprise Systems vendor, and hence contain an element of bias. That said, these stories were endorsed by the customer firms with contact details and quotes from members of senior management, providing an opportunity for verification. So, to some extent, this lends a bit more credibility to the data. The results from this secondary evidence do support the proposed model, providing the grounds for pursuing first-hand empirical verification of the model in a subsequent study.

Going Forward: Further Research

This research is intended to be continued in the near future through the means of primary case studies and a survey. Primary case studies of about 5 organizations that have adopted Enterprise Systems to transform their business will be used to understand and test the causality of the model better. A survey of about 100 firms that claim to have undertaken business transformation adopting Enterprise Systems is planned to generalize the results further using a large dataset. In addition, the potential relationships between the constructs not researched yet (shown by the dotted arrows in Figure 1) will be explored in the study to be conducted.

Conclusions

Enterprise Systems are continuing to equip the corporate world to survive the contemporary times of severe competition and change. This paper is a research in progress that proposes a new model, which is a step forward from the research conducted so far. This model explores the potential of Enterprise Systems, beyond operation efficiency, in achieving innovation and reshaping the business strategy in adopting firms: a path hardly travelled till now. This model proposes that Enterprise Systems, when used to integrate, optimise and informate can help firms achieve alliance innovation, process innovation and reshaped business strategy respectively. The paper also provides empirical evidence for the proposed model with a preliminary study that supports the propositions. The contribution of this study is the finding, based on secondary data, that Enterprise Systems can create business value beyond operational benefits, specifically in the form of process innovation, alliance innovation and reshaped business strategies. The intention is to test the derived hypotheses further by rigorous means through primary case studies and a survey. This research, once completed, will assess the role of Enterprise Systems in enabling business transformations beyond operational benefits.
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