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Business Benefits from Enterprise Systems Implementation in New Zealand

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Abstract

Organisations rely on their enterprise systems (ES) to integrate and optimise business processes, automate business transactions and share context-rich information to support decision making, according to the literature. But does this happen and how? This study examines key benefits that organisations generally seek from ES implementations, how ES data are transformed into knowledge, how this knowledge is utilised to achieve business benefits and the critical success factors for this process. Findings indicate that key benefits New Zealand organisations expect from ES include improve information flow, reduce out-of-inventory events and implement process efficiencies. An important finding is that New Zealand companies have only recently started tracking benefits through analytical processes to optimise and realise business value from their ES investment. Implications for practice are discussed with a focus on usability of ES and its information.

Keywords

Enterprise systems (ES), enterprise resource planning (ERP), data, knowledge, business benefits

Introduction

Enterprise systems (ES), also known as enterprise resource planning (ERP) systems, are large, complex, highly integrated information systems designed to meet the information needs of organisations and are, in most cases, implemented to improve organisational effectiveness (Davenport 2000; Hedman & Borell 2002; Markus & Tanis 2000). These are comprehensive, fully integrated software packages supporting automation of most standard business processes in organisation including extended modules such as supply chain management (SCM) or customer relationship management (CRM) systems. ES applications connect and manage information flows across complex organisations, allowing managers to make decisions based on information that accurately reflects the current state of their business (Davenport & Harris 2005; Davenport, Harris & Cantrell 2002). These systems are available from vendors such as SAP, Oracle, Microsoft and several others integrating various disparate facets of business including sales and marketing, distribution, logistics, manufacturing, human resource management (HRM) and accounting into one integrated business system. The major benefits from ES implementation include integration and optimisation of business processes, automation of business transactions and sharing of context-rich information to support decision-making (Davenport, Harris & Cantrell 2002; Hawking, Stein & Foster 2004). A number of research studies have been conducted to establish and understand the critical success factors for ES implementations (e.g., Allen, Kern & Havenhand 2002; Bancroft, Sep & Sprengel 1998; Holland & Light 1999; Parr & Shanks 2000; Plant & Willcocks 2006; Sarker & Lee 2000; Scott & Vessey 2002; Skok & Legge 2001; Sumner 1999; Yang & Seddon 2004). However, there has been little research to understand the effectiveness of ES in the post-implementation phase (Hedman & Borell 2002) which makes it difficult to draw explicit conclusions from the IS benefit research on the impact of ES on organisational performance (DeLone & McLean 1992; Hedman & Borell 2002). Despite the big costs and potential for even bigger benefits, internationally there has been relatively little research that examines ES implementation at the strategic decision-making process level (Viehland & Shakir 2005).

The current study builds on and extends existing ES research. The purpose of this study is to examine how organisations are realising business value from their ES investment. The study does so through a vendors' and consultants' perspective, with interview data collected from ES vendors, ES consultants and IT research firms who are actively engaged in ES implementation. This approach differs from the organisational approach usually found in the literature, which focuses on the users' perspective.

The pursuit of business benefits from ES is conceptualised as a series of steps that begin with goal seeking and conclude with realisation of benefits. The stages mirror the typical decision-making process. This study examines key benefits that organisations generally seek from ES implementations, how ES data are transformed into knowledge, how this knowledge is utilised to achieve business benefits and the critical success factors for this process. The results provide insight into current ES implementation and post-implementation practices in NZ.

The concepts of data, information and knowledge have been explored by many researchers. Data is a set of discrete, objective facts about events (Davenport & Prusak 1998). In an organisational context, data is described as structured records of transactions, readily available, that record facts about day-to-day operations of that organisation (The_OR_Society 2003). Information is data that makes a difference (Davenport & Prusak 1998) processed into meaningful content by adding value and context to it (The_OR_Society 2003). Davenport and Prusak (1998, p. 5) define knowledge as, "a fluid mix of framed experience, contextual information, values and expert insight that provides a framework for evaluating and incorporating new experiences and information."

This study is organised as follows. The first section introduces the study and provides background on ES. The next section outlines the research methodology. The third section presents the empirical findings from interviews with key players in the New Zealand ES market. The fourth section summarises and concludes on the current status of ES implementation and post implementation practices in NZ.

Research Methodology

Using a qualitative research methodology, primary data were collected by way of semi-structured interviews with key informants in the ES implementation industry. The interviews were carried out between February and August 2006. The participants were senior ES consultants or senior managers in the organisations which are key players in the field of ES in New Zealand, principally major ES vendors, ES consultants and IT research organisations (see Table 1). The positions of the participants included: director professional services, consulting manager, managing director, consulting practice director, partner group manager, vice president, consulting partner, general manager and business consultant.

Table 1: Key informants for the study

ES Vendors (Flagship ES products)	ES Consultants	IT Research
SAP NZ (SAP)	PricewaterhouseCoopers NZ	Gartner Limited NZ
Oracle NZ (Oracle, J.D. Edwards, PeopleSoft)	Ernst & Young NZ	IDC NZ
Microsoft NZ (Dynamics (earlier Navision))	KPMG Consulting NZ	
Infor NZ (Mapics, SSA Global (earlier BaaN))	EMDA NZ	

The primary purpose of the interviews was to seek insights from experienced ES stakeholders and professionals in answering the questions of the study which are:

- (a) What are the key business benefits that organisations seek and are possible through utilisation of ES and its information?
- (b) How do organisations convert ES data into knowledge and how is that knowledge applied to decision making to maximise benefit realisation?
- (c) What are the critical success factors for this process to be successful?

Contact was first established with the informants through email and by phone. An introductory letter briefly explaining the study and seeking an appointment for an interview was then sent to the informants. When the appointment was confirmed, the research information sheet and questions were sent to the participant. Ten face-to-face meetings between 60 and 90 minutes each took place at the participant's organisations, with one participant from each firm. The focus of the interview was to obtain answers to the questions sent in advance. The informants discussed ES implementations based upon their perspective and experience in terms of their ES applications, their clients and their implementation methodologies. The interviews were tape recorded and transcribed immediately after each interview. The Nvivo 7.0 qualitative software tool (QSR 2006) was used for data analysis. The empirical findings were analysed based upon the individual responses from the various informants on the different study questions and the inferences reported.

This methodology follows a similar approach used by Shakir (2002), who also investigated aspects of ES implementation in the NZ vendor-and-consultant community. The focus of that study was to identify key drivers influencing ES adoption and implementation (e.g., Shakir and Viehland, 2004) whereas the focus of the current study is on the realisation of business benefits from ES.

Key Business Benefits Organisations Seek

The types of benefits that companies might anticipate from their ES implementation, and the extent to which organisations have actually attained those benefits on a post-implementation basis, are areas being proactively pursued in the professional literature (e.g., Cooke & Peterson 1998; Davenport, Harris & Cantrell 2002; Deloitte 1998; Donovan 1998, 2001; Hedman & Borell 2002; Ittner & Larcker 2003; Jenson & Johnson 2002; Markus & Tanis 2000; Robey, Ross & Boudreau 2002; Shang & Seddon 2000; Shanks, G. et al. 2000; Soh, Kien & Tay-Yap 2000; Yang & Seddon 2004). The business benefits that organisations seek through utilisation of ES and its information was an important outcome of this study, was discussed at length with the informants, and are summarised in Table 2. A reminder that this is a vendors' and consultants' perspective that applies to many implementations in multiple sectors.

Table 2: Key business benefits that organisations seek through ES

Participants	Business benefits
SAP, OR, MS, EDMA	• Improve information flow
SAP, OR, MS, EMDA	• Reduce inventory and reduce out-of-inventory events
PWC, OR, MS, EMDA	• Improve process efficiencies
PWC, OR, MS,	• Overall cost reduction by automating functions
SAP, PWC	• Reduce head count
SAP, EMDA	• Increase information visibility
SAP	• Supply chain operations reference (SCOR) model KPI's
SAP	• Reduce month-end closure time
SAP	• Integration of processes to achieve seamless resource management
SAP	• Increase productivity and throughput
SAP	• Incorporate vendor-managed inventory (VMI)
SAP	• Become more agile and efficient
PWC	• Drive efficiencies in the supply chain
OR	• Automate processes
MS	• Improve response time
EMDA	• Transparency in costing information
EMDA	• Reduce work-in-progress
EMDA	• Improve bills-of-material management
Notes: OR = Oracle, MS = Microsoft, PWC = PricewaterhouseCoopers	

How Organisations Convert ES Data into Knowledge

The informants revealed that creation of knowledge from ES data was a key motivation for the second wave of implementation. During the first wave a typical complaint from organisations was that although a lot of information was available within the ES, only standard reports and standard forms for queries were provided in the software with a limited capability for data mining and data analysis.

Microsoft explained that user organisations considering a move to phase 2 ES implementation posed questions such as what does the system offer in terms of integrated reporting or integrated query to better use the data in the ES. For example, if an organisation sought information on raw material availability, do they need to run a report or is there a dynamic on-line query that can be used to show how much raw material is available to meet their needs. Organisations are looking for systems that have an inherent capability to give them that kind of information. Organisations want to extract data, manipulate it and then present the information back in the form of a report, dashboard, scorecard, or KPI. The traditional reporting mechanism is a paper-based report with a list of deliverables, the KPI reporting provides information on how the organisation is performing against pre-defined key metrics, and the typical operational reports provide information such as how many products were produced when and where.

This study also found that organisations approach reporting requirements differently. Some organisations use the inherent capability of the software, whereas other organisations have now gone out to multi-dimensional cubes of data warehouses to manipulate large amounts of data. If the data are located in a single place then the enterprise software is expected to be able to provide the report straightaway, but if the data are in multiple places then the organisations are using customised data warehouses to bring those disparate forms of data together and manipulate the data into a format needed for effective management reports and conversion in knowledge for decision making.

Additional comments about how organisations convert ES data into knowledge, as identified by various participants, are provided in Table 3.

Table 3: How organisations convert ES data into knowledge

Participant s	How organisations convert ES data into knowledge
SAP	<ul style="list-style-type: none"> Organisations convert data into knowledge by using proper tools such as data warehouse and business intelligence systems. Organisations generally lack clarity on the definition of which information is critical to the success of the organisation and the data views that are needed to get valuable information.
PWC	<ul style="list-style-type: none"> ES products come with predefined reporting tools which provide a generic way of presenting data. To make this into useful business information to suit specific needs requires customisation; and organisations do not want to customise because it drives up their life time costs.
Microsoft	<ul style="list-style-type: none"> Organisations are looking to see what the system (especially at phase 2 implementation) is offering in terms of integrated reporting or query that allows them to use data and whether the systems have an inherent capability to give them the required information. There are organisations that want to extract data, manipulate it and then present the information back in the form of a report, dashboard, scorecard, or KPI. Some organisations use the inherent nature of the software directly, whereas other organisations have created data warehouses to manipulate data into a format needed for management reporting.
Oracle	<ul style="list-style-type: none"> Most of the time ES is just used as a financial system and a storage repository therefore lacks knowledge-producing results. All major ES vendors have business intelligence built into their ES which companies can use for converting ES data into knowledge. Organisations also use business analytics or reporting tools or a combination of both to extract information and create knowledge. Organisations put together a data warehouse, bring in data not captured in ES from other heterogeneous environments, mine it and present the information to user communities on a regular basis. They are also now producing enterprise portals which are Web interfaces for the senior managers to see financial trend analysis and a whole variety of other key requirements.
EMDA	<ul style="list-style-type: none"> Initially an ES implementation can be overwhelming because organisations do not always see that they have information. What they see is data. They have to convert the data into a meaningful form to distil information. That way people think more about their information and start looking for correlations, causal relationships and look at data with specific questions using business intelligence. Organisations also use standard reports in the system such as aging or ABC analysis on inventory management, which also provide good information.

To make better decisions, business executives need relevant and useful information at their fingertips. But there is often a large gap between the information that decision makers require and the large amount of data that are available in the system that businesses collect every day. This is called the "analysis gap". The BI systems access large volumes of data and deliver relevant information instantly to decision makers in a form to which they can relate. This makes possible a quantum leap in the quality of analysis that can be performed, which leads to a better understanding of the business. But the hardest aspect is being able to define what information is useful and relevant to a decision. BI systems at the enterprise level are charged with collecting and reporting a company's most important metrics or the KPI's which guide managers in making decisions that affect a particular business unit as well as the company at large.

How Organisations Utilise This Knowledge to Achieve Business Benefits

To receive benefit from ES, there must be no misunderstanding of what it is about, its usability and, even more importantly, organisational decision makers must have the background and temperament for this type of decision making (Donovan 1998). In the past decade, an increasing number of companies have been measuring customer loyalty, employee satisfaction and other performance areas which they believe ultimately affect profitability. But the reality is that only a few companies realise improvements in these because they fail to identify, analyse and act on the right non-financial areas to achieve strategic objectives (Ittner & Larcker 2003). It is therefore important to understand the process of identifying and analysing the right information for effective decision making to achieve the desired benefits.

Results from this study reveal that organisations use balanced scorecard type of performance evaluation techniques to identify the drivers for the success of their business strategy. Kaplan & Norton (1992, 1996) developed the balanced scorecard linking a firm's strategic objectives to performance measurements with a view of evaluating the enterprise performance towards meeting their strategic objectives.

The drivers identified through this process are used in tools such as management cockpits which have data mining capability to understand what the problem is and how managers should intervene. Organisations also use business process simulation techniques, scenario planning and "what if" analysis when they want to examine a problem under various scenarios to explore possible outcomes. These tools typically are provided in wave 2 enterprise systems. SAP confirmed they had strategic enterprise management functionality tools that allow organisations to use balanced scorecard functionality to develop management cockpits for current and accurate

reporting, perform business process simulation, try out different budget scenarios and determine the impact and sensitivities of various models.

However, most informants suggested that these tools are only being used by sophisticated, mature organisations as using these tools requires high-level strategic thinking about what the true business strategy is and what determines success of the business strategy. Table 4 summarises this discussion how organisations utilise ES knowledge to achieve benefits as identified by various participants.

Table 4: How organisations utilise ES knowledge to achieve benefits

Participants	How organisations utilise ES knowledge to achieve benefits
SAP	<ul style="list-style-type: none"> Organisations use balanced scorecard techniques in conjunction with data mining capability to understand what the problem is and how managers should intervene. Organisations also use business process simulation techniques and scenario planning when they want to analyse the problem by assessing different possible outcomes. These tools are being used by sophisticated, mature organisations with high-level business strategy analysis in place.
Microsoft	<ul style="list-style-type: none"> Information is transformed into knowledge by adding experience, context and interpretation so that it is used for decision-making to achieve benefits. There have been very few examples of a company using business intelligence tools strategically. The issue with balanced scorecards is that, firstly companies need to understand what the balanced scorecard is going to do for them. It is not a reporting tool but it is a point-in-time view of how the business is performing against some pre-set KPI's or measures. NZ organisations are not yet ready for a high level of strategic analytical tools, at least to the extent that might be expected.
Oracle	<ul style="list-style-type: none"> Companies are now asking how to actually optimise and improve. Although, scorecards are as part of ES, NZ companies are not actually managing scorecards, but are just reporting KPI's. Benchmarking is done by industry. The software vendors give clients a base line, with possibility to further build upon. This a good place to start because many companies do not even know what it is they want to measure.
EMDA	<ul style="list-style-type: none"> More and more of the ES vendors are developing their own business intelligence engine since the business process and the underlying information are not mutually exclusive. Each of the major ES vendors has some form of scorecard in their software. The abilities to drill down through layers of data, and do the analysis in any form, then lead to managerial insight.

Findings from this study also revealed that more and more software vendors are developing their own business intelligence engine to provide the database foundation to customers. They are trying to provide the middleware that ties the technology layer and the application together because they understand that the business process and the underlying information are not mutually exclusive – businesses need to be in control of both.

Three or four years ago, there were a lot of unique business intelligence organisations such as the SAS group, Cognos and Microsoft Business Objects. They are still there and have a significant market share. But the bigger ES companies are starting to see that they need to take ownership of the database and data layer. PeopleSoft expressed this need-for-ownership: "it needed to be part of the DNA of the software". So that when the machine is turned on in the morning the first screen reports how the business is performing. The ability to drill down through layers of data and do the analysis in any form then leads to managerial insight. Actions backed up by good analysis give confidence to the action taker. If that data is not controlled through the software, it is harder to integrate it and it does not perform as a natural part of the software. So the vendors are trying to capture the business intelligence component for decision making.

Each of the major players has some form of scorecard that fits in their software. But the challenge for the bigger software companies is that a new customer frequently has something in place already. The customer may not be pleased to be asked to displace something they are quite familiar with. Therefore the approach of software organisations is to be all encompassing in terms of the technology they can deploy.

In the context of NZ companies, Microsoft reports there have been very few successful business intelligence implementations. The implementations work in that the reports come out, but examples of a company using them strategically to make decisions are not evident. The issue with balanced scorecards, for example, is that companies need to understand what the balanced scorecard is going to do for them. The balanced scorecard is not a reporting tool but it is a point-in-time view of how the business is performing against some pre-set KPI's or other measures. So the organisations have to understand what they want to measure and use it for.

Balanced scorecard is a strategic business tool, for the use of the chief executive and down to middle management. It explains causal relationships between current activities and the strategic aims of the organisation

linking actions with metrics. Managers at lower levels of the organisation need to understand its benefits since they may feel threatened when their performance is measured and reported. Microsoft reports that most NZ organisations are not yet ready to employ such a strategic business tool, at least not to the extent one might expect.

KPI reporting is similar to a balanced scorecard approach, except KPI's provide more data about how the company is performing against set criteria. Generally when organisations talk about balanced scorecards, they are often referring to KPI reporting.

Critical Success Factors for ES Impact to Produce Organisational Benefits

Substantial research has been performed in an attempt to understand ES success. Some researchers contend that ES outcomes, including both success and failure, are non-deterministic, recognising that ES implementation is an ongoing process during which many conditions could change (Liang & Xue 2004; Markus et al. 2000; Robey, Ross & Boudreau 2002). However, Markus and Tanis (2000) have defined success for ES as the best outcome the organisation could possibly achieve with ES, given its business situation, measured against a portfolio of project, early operational and longer term business results metrics. Esteves, Casanovas and Pastor (2003) suggest that ES success can be defined as finishing on time, on budget, obtaining the expected functionality, the system is being used by its intended users and implemented in the correct way taking into account the organisational and cultural values of the organisation. Shanks, Seddon and Wilcocks (2003) say success of ES depends on effectiveness of the implementation, and on the additional benefits that can be obtained by leveraging the technology. This aspect of "leveraging the technology" forms the basis of this study.

Given the significance and risk of ES projects, it is essential to examine and understand the factors which determine ES effectiveness and the influence of ES on the decision-making process for organisational benefits. Critical success factors (CSF) are the few key areas where things must go right to achieve success (Rockart 1979). One of the key mistakes most companies make is that they view an ES project as complete when the system is turned on, which greatly limits their ability to achieve benefit. They view the output of the system as a set of information transactions and do not take advantage of the information to manage the business differently. Enterprise systems do a good job of automating, integrating and optimising business processes. However, potential benefits also can be captured by the utilisation of the high quality information which an ES provides, to make improvements in and even transformation of management and reporting processes (Davenport 2000).

In this study, most informants agreed that there certainly were CSF's for the process of transforming ES data into knowledge and its utilisation for achieving benefits. Table 5 summarises the critical success factors for ES implementation, as identified by the various participants.

Table 5: CSF for ES data transformation process to achieve benefits

Participants	Critical success factors for ES to produce organisational benefits
SAP, MS, OR, EMDA	<ul style="list-style-type: none"> Active executive commitment in the project, including translation into departmental or divisional strategies and visions
SAP, IDC, OR	<ul style="list-style-type: none"> Effective change management process
SAP, IDC, MS	<ul style="list-style-type: none"> User feedback, involvement and understanding of the process and expected outcomes
SAP, MS	<ul style="list-style-type: none"> Business strategy is clearly defined, articulated and aligned
IDC, OR	<ul style="list-style-type: none"> Clear definition of scope before implementation
SAP	<ul style="list-style-type: none"> Understand the key drivers, and have the means to influence the drivers
SAP	<ul style="list-style-type: none"> Quality of data since unclean data can be very risky
SAP	<ul style="list-style-type: none"> Consistent data management and clear data definitions
SAP	<ul style="list-style-type: none"> Technology, although with the development of services oriented business architecture (SORBA), this will be less of an issue in the future
IDC	<ul style="list-style-type: none"> Proper project management from both vendor and client
IDC	<ul style="list-style-type: none"> Managing client expectations – do not over commit and under deliver
MS	<ul style="list-style-type: none"> Design of information retrieval process appropriate to the business
MS	<ul style="list-style-type: none"> The technical parameters e.g., proper design of the mechanism of delivery
OR	<ul style="list-style-type: none"> Clear identification of the problems requiring resolution
OR	<ul style="list-style-type: none"> Expected end results or desirable solution
OR	<ul style="list-style-type: none"> Training
EMDA	<ul style="list-style-type: none"> Information gathering and application is seen as a technical project rather than a business project

Notes: MS = Microsoft; OR = Oracle

ES Maturity and Related Issues

The informants were encouraged to discuss any other issues which they perceived as relevant from their experiences in New Zealand ES implementations. Issues relating to ES maturity and IT in general were raised in several interviews.

ES maturity in an organisation depends on the number of years of experience the organisation has had with ES and the stage of ES implementation (Hawking, Stein & Foster 2004). This concept of ES maturity and the different stage of ES implementation is reinforced by the Nolan and Norton Institute (2000) classification that groups implementations into levels of maturity such as beginning when ES has been implemented in the past 12 months, consolidating when ES has been implemented between 1 and 3 years and mature when ES has been implemented for more than 3 years.

Most informants agreed that ES maturity has occurred at a slow pace in New Zealand organisations. This is mostly attributable to the small size of the NZ economy. However, this trend is now changing and most large organisations and many SMEs are approaching a fairly advanced level of maturity with ES technology and IT in general. The informants identified the following four issues in managing ES projects which highlight the slower pace of ES maturity within the NZ industry.

First, many NZ organisations do not conduct a proper business justification of their implementation. Although some improvement has been made in the past few years, most NZ organisations produce little or no value assessments that often lead to weak business cases and insufficient benefit models which cannot be used for benefit tracking. Plant and Willcocks (2006), in their study on critical success factors for ES implementations, found an increased emphasis upon the determination of clear goals and objectives at the project outset as one of the important factors for ES implementation success.

Second, many organisations in NZ believe implementation of ES is a technology challenge. However, according to most informants, it is more about people, process and change management, and less about technology.

Third, informants revealed that typically when a new system is implemented, productivity drops for a period and then goes up. Oracle suggested the depth of the drop depends upon how well the system is implemented, how well the change process is managed, how well the business case is defined and how well the managers are measuring and managing benefits before and after the implementation.

Fourth, until a few years ago the majority of organisations did not use the ES in its true capacity. ES was used as a financial system, as a central repository for personnel records, or as a method for raising purchase orders. This was because the organisations had not thought about what they were trying to optimise, what benefits they were trying to bring into the organisation, what they were trying to change, how they were trying to manage the business, and whether they could actually get the information they needed to manage the business from the ES. However, software vendors now report that they see several companies seeking ways to get more value out of their ES investment. Companies have started asking how to establish analytical processes to optimise and realise business value from their ES investment. Many NZ organisations have already completed their first phase of ES needs and are now extending into the second phase with CRM, SCM, or BI. NZ organisations have now started realising the value of technology and its use to stay ahead of competition.

Conclusions and Further Research

The main objective of this study was to understand the current practices of ES implementations in New Zealand focusing on usability of ES information by organisations for realising business value. Therefore, the study reported on core areas such as key benefits that organisations generally seek from ES implementations, how ES data is transformed into knowledge, how ES knowledge is utilised to achieve business benefits and the critical success factors for this process that reflect on current ES implementation and post-implementation practices in NZ. The key findings are summarised in Table 6.

It is also clear from the findings that NZ organisations are still weak in proper business justification of implementations. Although some improvement has been made in the past few years, most NZ organisations produce little or no value assessments, which leads to weak business cases and insufficient benefit models that cannot be used for benefit tracking. Software implementations require considerable investment, not just in software and consultant costs but also internal time. To ensure the investment is sound, it is in the organisation's interest to prepare a business case that considers expected benefits from the new software and the money that is being spent. Additionally, many organisations in NZ believe implementation of ES is a technology challenge however findings show that it is more about managing people and processes.

Many ES implementations in New Zealand are several years old now however, these companies have only recently started asking how to actually optimise processes and realise business value from their information

technology investment. Organisations are establishing analytical processes that continuously improve their ability to take advantage of the technology.

This study's findings are limited to the views of a few professionals from different ES vendors, ES consultants and IT research organisations. There may also have been some influence on the responses by the commercial interests of the participant's firm. However, the study's conclusions are drawn from interviews with a diverse set of individuals with considerable experience in the ES industry in NZ and positioned in key firms in the industry. This is reflected in the different perspectives the research informants provided based upon their own experiences and interpretation of ES implementations and the post implementation practices in NZ.

Table 6: Key findings on usability of ES and its information by organisations

<p>The key benefits organisations seek</p> <ul style="list-style-type: none"> • Improve information flow • Reduce inventory and reduce out-of-inventory events • Improve process efficiencies • Overall cost reduction by automating functions • Reduce head count • Increase information visibility
<p>How organisations convert ES data into knowledge</p> <ul style="list-style-type: none"> • Organisations use data warehouse and business intelligence systems • Organisations extract data, manipulate it and report it in the form of a report, scorecard or KPI • Organisations use standard reports such as aging or ABC analysis on inventory management • A clear definition of what information is critical to the success of the organisation is required • This is an area where organisations are still struggling
<p>How organisations utilise this knowledge to achieve benefits</p> <ul style="list-style-type: none"> • Organisations use balanced scorecard type of performance evaluation techniques to monitor drivers for the success of their business strategy • Organisations use business process simulating techniques, scenario planning, what-if analysis and management cockpits to identify problems and analyse potential solutions • These tools are provided in ESs but are usually limited to sophisticated, mature organisations with high level strategic thinking about what the business strategy is and what determines its success
<p>Critical success factors for ES impact to produce organisational benefits</p> <ul style="list-style-type: none"> • Active executive commitment in the project, including translation into departmental or divisional strategies and visions • Effective change management process • User feedback, involvement and understanding of the process and expected outcomes • Business strategy is clearly defined, articulated and aligned • Clear definition of scope before implementation

Further research is in progress to analyse the current practices and the critical effectiveness constructs of ES identified by this study from the vendors' and consultants' perspectives. Studies are being taken up in the New Zealand organisations to investigate the differences between the perspectives of the consultants and vendors and the organisations, where such implementations were realised.

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