Explaining Different Patterns of Business Benefits from Two ERP Systems

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Abstract

This paper compares the business benefits achieved by two companies from their ERP systems. The Shang and Seddon enterprise system benefit framework was used to determine the business benefits. Some of the issues with the comparison of case studies of ERP systems are discussed within the context of the findings. There is a discussion of the reasons why one company achieved more business benefits than the other. The paper concludes with a model proposing that ongoing education, training and support and change management in the post implementation period increases the skills and abilities of business managers and users. This will have an influence on efficient and effective use of the system and business process improvement, hence maximizing the business benefits an organisation gains from its ERP system.

Keywords

Organizational change, IS success, software packages, change management, case study

INTRODUCTION

Enterprise Resource Planning (ERP) systems are large software packages that provide an integrated environment based on an enterprise wide data model with a set of software applications that allow processing of all the data of the organisation (Bancroft et al. 1998). Despite collective investment by organisations worldwide in ERP systems in the order of billions of dollars (Stein 1999), many organisations do not know if they have achieved a positive return on their investment. Traditional evaluation measures such as return on investment or payback are unsatisfactory as they fail to take intangible benefits into account. Early studies of ERP systems concentrated on the ERP implementation project (e.g. Holland & Light 1999; Parr et al. 1999; Parr & Shanks, 2000a; Parr & Shanks 2000b). Some studies have examined the post implementation period to determine the business benefits that organisations have gained from ERP systems (Davenport 2000; Koh et al. 2000; Markus & Tanis 2000; Ross & Vitale 2000; Shang & Seddon 2002a; Shang & Seddon 2002b). The research that is reported in this paper is part of a larger study examining the post implementation period of ERP systems in selected manufacturing organisations. It aims to understand and explain what business benefits have been obtained, and how and why these business benefits have evolved over time.

BACKGROUND

The implementation and use of an ERP system is viewed in this research from the perspective of organisational change (Davenport, 2000). The work of Pettigrew (1990) on organisational change has provided a basis to study the adoption and use of information systems from a perspective of organisational change. Pettigrew (1990) stated that "theoretically sound and practically useful research on change should explore the contexts, content, and process of change together with their interconnections through time."

A number of "life cycles" have been proposed for the ERP implementation process (e.g. Markus & Tanis 2000; Parr & Shanks 2000b; Ross & Vitale 2000). These lifecycles differ in focus and in the number of stages proposed for the process. Of these lifecycles the Markus and Tanis (2000) enterprise system experience cycle is the most comprehensive in that it proposes four phases in ERP implementation with equal focus on each. The four phases are Chartering, Project, Shakedown and Onward and Upward. The Chartering phase is the initial planning phase, and the Project phase consists of all activities that contribute to get the system up and running. The Shakedown phase starts when the system goes "live" and finishes when normal operations are achieved. Consistent with the effect of organisational change (Eason, 1988), in this phase the process of adapting to the new system typically results in a performance dip (Deloitte Consulting 1999; Markus & Tanis 2000; Ross & Vitale 2000) which may last up to 12 months or more. The final phase Onward and Upward starts when normal operation is achieved and lasts until the system is replaced.

Although this study concentrates on post implementation (i.e. the Shakedown and Onward and Upward phases) the earlier phases are important since any unresolved problems from these earlier phases will impact on the business benefits achieved after go-live (Markus & Tanis 2000).

The specific research questions addressed in this paper are:

(1) What are the business benefits of ERP systems?

(2) How and why do business benefits evolve during the post implementation period?

RESEARCH APPROACH

This study uses Shang and Seddon's (2002a) enterprise system benefit framework (see Figure 1 and Figure 3) to determine the business benefits gained in the post implementation phase of the ERP system lifecycle. The Shang and Seddon (2002a) framework was developed from a study of 233 organisations. It includes five dimensions of benefits: operational, managerial, strategic, IT infrastructure, and organisational. Within each dimension there are multiple business benefit categories. The framework views business benefits mainly from the perspective of business managers i.e. middle management. It provides a convenient means of identifying the business benefits an organisation has realised in the post implementation phase of the ERP system lifecycle. However, it must be emphasised that it does not suggest that every organisation will or should obtain *all* of these benefits, but that the framework provides a comprehensive list of the business benefits that are *possible* from enterprise systems.

The results presented in this paper come from the case studies of two manufacturing organisations. One of the reasons for the selection of manufacturing companies was because the Shang and Seddon (2002a) framework was validated with in-depth case studies of four utility companies. Manufacturing companies are more likely to have implemented more ERP modules i.e. right across the value chain. An interpretive case study approach was used. Data was collected in the latter part of 2001. The primary source of data collection was from face to face in-depth semi-structured interviews with key informants chosen because of their position within the organisation. The operational, managerial and organisational business benefits were obtained from the perspective of business unit managers, strategic benefits from the perspective of senior management and IT infrastructure from the perspective of the IT manager. Interviews were tape recorded, transcribed and returned to interviewees for checking to ensure accuracy. To provide triangulation other sources of data collected were company documentary evidence, for example, annual reports, company newsletters etc.. The Nudist software package was used to aid data analysis. Full details of the research design can be found in Staehr et al. (2002).

THE CASE STUDIES

ManA is a publicly owned Australian company employing around 9,000 staff across approximately 30 countries and with revenue of $4 billion annually. It was one of the first companies in Australia to implement an ERP system. In the early 1990s ManA had legacy systems that needed replacing due to increasing problems with maintenance, and the looming year 2000 problem. Some systems, for example, inventory, were 14 years old. A need was seen for an integrated system, various ERP systems were evaluated, and SAP was the system chosen. ManA intended to ensure its four Divisions were operating at the leading edge of information technology (IT) and planned to use IT as a basis for improved customer service. The case entity is a consumer products business (BrandX), making up about three-quarters of the Consumer Products (CP) Division which is one of four divisions in ManA. BrandX itself consists of a number of different businesses with sites geographically dispersed in Australia and New Zealand.

ManB made up half of a large publicly listed conglomerate and was one of its three businesses when the decision to implement SAP was made in 1996. It has since been sold and is now owned by another company. Although several ERP systems were evaluated by ManB the decision was influenced by one of the other two businesses having already implemented SAP.

Table 1 below compares the characteristics of the BrandX (ManA) and ManB implementations. Both companies implemented SAP primarily for business reasons rather than technical reasons. They spent roughly comparable amounts of money on the implementations. The modules implemented show that both implementations were value-chain implementations and therefore were of similar complexity (Brown & Vessey, 1999). At the time of assessing the business benefits both companies were using similar versions of SAP.

However, they used different implementation strategies. BrandX used a Big Bang (Bancroft et al., 1998) strategy and ManA used a Small Bang (Bancroft et al., 1998) strategy. A Big Bang strategy involves the implementation of all modules at all sites at the same time and is the highest risk ERP implementation strategy. The BrandX business benefits shown in Figure 1 were assessed 21 months after the "go live" date. In a Small Bang strategy all modules are implemented at each location in turn (i.e. a mini Big Bang). This implementation strategy is less risky. ManB implemented SAP in 65 locations across five countries. The ManB business benefits shown Figure 3 in were assessed 4 years after the first site went live and one and a half years after full implementation (i.e. after the last site went live).ERP implementations have been categorised by Parr and Shanks (2000a) as comprehensive, middle road or vanilla. Both the BrandX and ManA implementations can be classified according to the Parr and Shanks taxonomy as comprehensive, the most complex type of implementation. According to Parr and Shanks (2000a) comparison of case studies is valid only when they can be classified as the same type of ERP implementation.

Table 1: Characteristics of the BrandX (ManA) and ManB implementations

	BrandX (ManA)	**ManB**
Motivation for Implementing SAP	Business reasons	Business reasons
Cost of Implementation	More than $20 million	~$25 million
Modules	FI, CO, PP, MM, SD, PS, BW	FI, CO, MM, PP, SD and assets
Version of SAP implemented	4.5	3.0 , then upgrade to 4.6
Implementation Strategy	Big Bang	Small Bang
Implementation Type	Comprehensive	Comprehensive
Implementation Approach	System replacement	System replacement
Implementation Partner	No, used internal expertise	Yes
Customisation?	Yes – extensive in some areas	Yes - kept to a minimum
Business Restructuring	IT and Finance shared services before "go live"	Accounts payable and accounts receivable shared services after "go live"
Was project completed on time, within budget and within original scope?	Yes	Yes
When were the business benefits assessed?	21 months after "go live" (Figure 1)	Four years after first site went live. One and a half years after last site went live i.e. full implementation (Figure 3)

For the implementation at BrandX there was expertise already within ManA from previous SAP implementations in the other Divisions. However this turned out to be a disadvantage as the BrandX businesses were very different from those in the other ManA Divisions. This lack of knowledge about the BrandX businesses ultimately led to performance problems in the early operational period and it took 9 months and a couple of hardware upgrades before this was resolved. Second and third level staff were put on the implementation team because BrandX wanted to keep its best people in the business. As the BrandX implementation coincided with the introduction of shared services it was also used as an aid to downsizing. Some staff were put on the implementation team with the understanding that after the implementation they would no longer be required at BrandX. In contrast Man B had an implementation partner. An excellent relationship developed and was maintained throughout the whole implementation period. The implementation partner had a seamless presence during the project in that employees of ManB could not tell the difference between an IT person from ManB and a person from the implementation partner company. The project manager at ManB selected only the best business representatives from ManB for the implementation team.

The implementations in both companies were viewed as system replacements. At BrandX there was reengineering to the extent only of selecting the "best practices" of the existing BrandX businesses. BrandX customised SAP to the level of code changes in the forecasting area but ManB kept customisation to a minimum. ManB was able to convince SAP to provide a customised solution they required. Interestingly, ManB

subsequently discovered that it was configurable in SAP without the customisation. Both cases involved business restructuring (Parr & Shanks 2000a) with the implementation of shared services before "go live" in BrandX and after "go live" in ManB.

RESULTS AND DISCUSSION

The business benefits achieved by BrandX are shown in bold in Figure 1 below. Additional business benefits discovered in this research and not part of the original Shang and Seddon (2002a) framework are shown in bold and italics. It is important to note that the benefits in Figure 1 are not uniform across the functional areas of BrandX. If a benefit has been realised this does not mean that all functional areas have reported that benefit. For example, cycle time reduction was realised for finance but not in manufacturing, and productivity improvement occurred in the finance area but in warehousing extra staff were required to ensure data quality. This difference of business benefits in different functional areas is consistent with Shang and Seddon's (2002a) findings. However, in addition this study found that the business benefits varied from site to site in the same company within a particular functional area. The following quotes provide examples. The first quote is from a small BrandX manufacturing site, "*I've got to say business improvement has really only come in the last, probably the*

Benefit Dimension	Benefit Categories	Benefit Categories continued
Operational	Cost reduction Cycle time reduction Productivity improvement	Data quality improvement Customer services improvement *Enforces accountability*
Managerial	Better resource management Improved decision making and planning	Performance improvement in a variety of ways
Strategic	Supports business growth Supports business alliances Builds business innovation Builds cost leadership	Generates product differentiation Enables worldwide expansion Enables ecommerce Generates or sustains competitiveness
IT Infrastructure	Builds business flexibility IT cost reduction	Increased IT infrastructure capability
Organisational	Changed work patterns Facilitates business learning and broaden employee skills Empowerment Building common visions	Shifting work focus Increased employee morale and satisfaction *Standardised employee induction and training*

Figure 1: Business benefits at BrandX

last three months, as things have started to settle down and as things have started to make sense, so it has taken a long time." And the second quote is from the largest manufacturing site: "The information we are getting from the system is still questioned. ….Our service still isn't there and I guess for us that is the ultimate measure in our performance." The quote indicates that the accuracy of the information obtained from SAP is still questioned at BrandX. Figure 2 (using Shang and Seddon's (2002a) perceived net benefit flow graphs) shows that the two sites in the same company are at different stages in gaining business benefits from the same system in the same functional area.

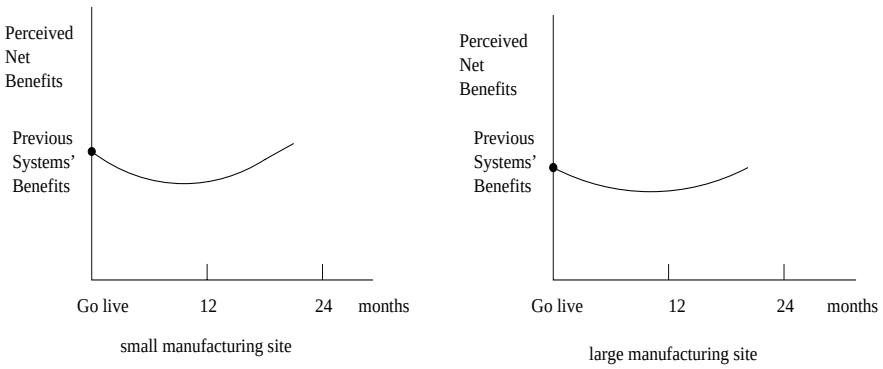

Figure 2: How business benefits evolved in the post implementation period at two BrandX manufacturing sites

It is interesting to note that despite the existence of IT shared services enabled at ManA by SAP, IT cost reduction has not been achieved. A contributing factor may be that BrandX depends on contractors for

approximately 40% of its IT staff. However, although there has been no IT cost reduction at the CP Division level there may have been IT cost reduction at the ManA level.

Analysis of the BrandX data identified two new benefits (shown in bold italic in Figure 1). The first, a new operational benefit, 1.6 Enforces accountability, relates to the increased accountability of users. They can no longer hide mistakes as their work impacts almost immediately in other areas of the business. As a finance business representative on the SAP implementation team remarked "factory people cannot keep secrets about problems in production". Koh et al. (2000) and Sia et al. (2002) also reported increased accountability of users of ERP systems. In contrast to the other operational benefits in the Shang and Seddon enterprise system framework this is an intangible business benefit. It also is a business benefit that is directly derived from the integrated nature of ERP systems. The second new benefit is in the organisational dimension and is 5.7 Standardisation of staff induction and training. BrandX consists of a number of businesses that prior to the SAP implementation all had disparate systems. Now there is increased flexibility for staff deployment across different businesses within the division/organisation due to the use of the one system. ManB has achieved more business benefits than BrandX as can be seen by comparing Figure 1 and Figure 3. However, it should be born in mind that the realisation of

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Operational	Cost reduction Cycle time reduction Productivity improvement	Data quality improvement Customer services improvement
Managerial	Better resource management Improved decision making and planning	Performance improvement in a variety of ways
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IT Infrastructure	Builds business flexibility IT cost reduction	Increased IT infrastructure capability Broadens IT staff skills
Organisational	Changed work patterns Facilitates business learning and broaden employee skills Empowerment Building common visions	Shifting work focus Increased employee morale and satisfaction Standardised employee induction and training

Figure 3: Business benefits at ManB

business benefits from ERP systems can take time to achieve with some estimates as long as four years (DeLoitte Consulting, 1999). A senior manager at ManB reported that they have achieved benefits they did not even know were possible at the time the decision to implement SAP was made. The new business benefit 5.7 Standardised staff induction and training reported at BrandX was also reported at ManB. A new business benefit at ManB in the IT infrastructure dimension is 4.4 Broadens IT staff skills. This has resulted in improved IT infrastructure risk management: *"The internal people that were helping to manage those systems have swung fully onto SAP, where they used to manage separate systems they're now all on SAP and have reduced risk as well by cross training, so there's no, one person that knows any one job. There is at least two, usually three people that know any one function, so that's a bit of a risk management resourcing as well."*

At ManB a site was back to normal operations by between three and six months post go-live and within twelve months they were ahead of where they were before SAP was implemented. This is illustrated in Figure 4 below. Efficiencies at ManB during the post implementation period were gained for example by implementation of a bar

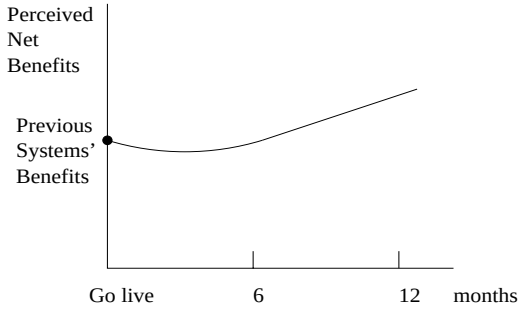

Figure 4: Business benefits as they evolved in the post implementation period at ManB

coding solution for inventory management and from shared services. Similar to BrandX, at ManB there is variation between the business benefits different sites are getting from using SAP. In the finance functional area: "*around 60%* [of sites] *probably would be using it at half its potential*." The fact that different business benefits are realised not only in different functional areas but also at different locations within the same company highlights the difficulty in assessing the business benefits a company achieves with its ERP system. It also highlights the fact that ERP systems are used within a complex social context and that it is important to collect data on the business benefits of the ERP system from a number of participants with a range of perspectives.

An important issue in this research is whether it is possible to separate out the business benefits of the ERP system from other organisational or IT changes. It is certainly pointed out during the interviews that the business benefits should only be those that have resulted from use of the ERP system. The following quote indicates that respondents are able to differentiate: *"Productivity has improved but it is not to do with SAP. It has to do with some other changes, the robot line etc. that we have put in."*

Cross Case Analysis

The business benefits of ERP systems are dependent on the elapsed time from the go-live date (O'Grady 2002; Markus 2000; Markus, Axline, Petrie & Tanis 2000). However, the different implementation strategies make a direct comparison of the two cases difficult. It is clear for BrandX with its Big Bang implementation strategy that the time of the go-live occurs on a specific date. So, when is the "go live" date for a "Small Bang" implementation? Is it after one site goes live, after the last site goes live, or somewhere in between? Clearly, ManB has had more elapsed time of SAP use than BrandX (see Table 1) and this has contributed to more business benefits being achieved.

The business benefits achieved by Brand X support O'Grady's (2002) contention that operational, managerial and IT infrastructure benefits are realised before strategic and organisational benefits. BrandX has not achieved business benefits to the same extent as ManB. In their study of ERP adoption and use Markus & Tanis (2000) have related the achievement of business benefits to problems and issues that occur at all stages in the ERP implementation life cycle, from planning, through the implementation process, and in the post implementation period. Table 2 shows a number of characteristics of the BrandX and ManB implementations. In studies of ERP implementation three of the characteristics i.e. implementation strategy, best business people on the implementation team, and extent of customisation of the ERP system have all been identified as critical success factors for the implementation process (Holland & Light, 1999; Parr & Shanks, 1999; Sumner, 2000; Esteves & Pastor, 2001). When comparing these factors alone it can be seen that ManB by the start of the post implementation period was better placed to achieve business benefits from their system. Another difference was the impact in BrandX of the internal IT people on the project team not fully understanding the business. In the case of ManB there was an excellent relationship with the implementation partner, one which lasted the entire life of the project and one which resulted in knowledge transfer to the internal IT staff by the end of the project.

Table 2: Differences between the BrandX (ManA) and ManB implementations

BrandX (ManA)	ManB
Most risky implementation strategy	Less risky implementation strategy
2nd and 3rd level business people on the implementation team	Best business people on the implementation team
Extensive customisation of SAP in some areas e.g. forecasting	Minimal customisation
Internal IT people on the implementation team did not understand the BrandX business	Excellent relationship with implementation partner

Education, training and support were approached differently at BrandX and ManB. At BrandX basic training was provided for users before the system went live, but the relevance of this training was questioned in some areas. The information in the training system was not "real" in terms of BrandX's data and it was not possible to do very much with it to see and understand what the new system would be like. Also it was expected that users would supplement the training sessions by finding time to spend in the training environment during their normal working hours. At BrandX, the largest manufacturing site had on site support for only two weeks after "go-live". It took this site until 18 months after "go-live" before they got a ManA SAP expert on site to help with some major problems that they still had with the system. At ManB the users were trained in basic business functions over the month prior to go-live. After go-live *"... we would provide on-site resource to take them through for the first month end close, so for the next five weeks*." There was then a follow up sweep through all the sites 12 months later.

At both BrandX and ManB on site training and support was limited to immediately after go-live with ManB providing a slightly longer period. Once on-site training and support finished both companies moved to phone support. However the user training at BrandX and ManB was limited not only in when and for how long it was conducted but also in its content. Users were not made aware of the integrated nature of the system and therefore of the impact of their mistakes on other system users. At ManB the nature of their implementation strategy allowed them to recognise the problem and address it for the later implementations.

There is evidence in both companies that training and support was insufficient, *"They don't know, they are not using the system properly because they do not know how to use it properly. A lot of the benefits from these things is knowing the system."* (BrandX) and "*It's amazing - you know I just went out to a site last week, clearing of open items is a transaction in there and you clear the open items. There was a thousand items and they were clicking on each one, one by one, matching them all up, whereas they could have just clicked on one item, said select beginning, select end, and it shows all of them, and just being able to ... two seconds. Why are you doing it that way, do you realize you can do it this way? Then suddenly there is an hour's worth of their month gone, multiply that by twenty little things and suddenly there's a week of their life taken up and I guess because you're not aware, they don't know that, and I guess they're not making the help desk call and saying well this doesn't seem right that it's taking - there's got to be a better way of doing this ... and maybe given their work load and so on they're not making the call*." (ManB)

The implications of the above quotes in terms of productivity and achieving business benefits are obvious. In addition previous research has shown that manual workarounds and inefficient use of a system can quickly become routine and therefore difficult to change as time goes by (Tyre and Orlikowski, 1994).

The need for more training and the benefits it would achieve was acknowledged at both BrandX and ManB At BrandX: "*Where I believe we haven't got the best out of it is we've not had a dedicated ongoing training team*" and "*we probably have to up skill a little bit more than we have in the past because SAP can be complicated and if you want to understand the true benefits of SAP we need to up skill our workforce a little bit more*." Similar views were expressed at ManB: " *The biggest thing is going out and doing training I think we are probably going to get the biggest benefit*." And " *I would suggest that training is an on-going requirement and needs a higher profile*."

It should also be noted that training and support needs vary: "*The guys that are happy with it are doing well with it, and the questions they are asking are in the next level up in terms of further refining the way they are doing things. They're saying how can I further improve this, and then you get the ones who are still at the base level type of questions and then you'll have the ones that don't ask anything at all. They are the ones you've got to worry about because either they have it completely under control, which I doubt, or they're so far snowed under that they are not even bothering trying to improve*." (ManB) This variation in training and support needs may be due to the capabilities of the users and/or the particular functional area they are working in. For example in the finance area, through their experience with spreadsheets, users are already familiar with the type of interface provided by SAP. However in the warehousing and distribution areas users may not have used a computer at all in their workplace before.

At BrandX one manager gave the following description of the ideal sort of employee you need when you "go-live" with SAP: "*You need to have someone who is computer literate for a start, who is hungry for knowledge, who is very quick on the uptake of process change, system change. Yes, you need to have a particular kind of person working for you that will really take up SAP and run with it*." It could never be expected that all employees in a company would be like this but education, training and support can make a difference. "*If you've got employees that have been in and around the business for some time and are used to older systems they are the ones that suffer the most from this type of change. And I think the better you can prepare them, because they are the ones who know how the business works*."

The varying outcomes in the two manufacturing sites at BrandX described earlier in the paper can be related to the education, training and support each had in the post implementation period. The small manufacturing site that had just started to obtain business improvements had the benefit of SAP experts on site for a couple of hours a month. However this was at the request of the site. The small site may have more success in getting support because they were considerably closer (geographically) to IT shared services than the large manufacturing site. Neither BrandX nor ManB were proactive in providing resources for on-going training and support in the post implementation period. These extra resources may have been needed for between 6 and 12 months and would represent a significant additional cost to the implementations. However, there is evidence to suggest that the business benefits achieved have been limited by a lack of appropriate resources in education, training and support.

Overall, change management at BrandX was not handled well. Managers were used to thinking a month ahead, not the 12 months that was required to prepare for SAP. They felt that it would involve a seamless change and

that they would be doing things after "go-live" fairly similarly to how they had been done before. As one manager said: "*I think the post SAP implementation was where we were lacking. We did a lot of work up to and including going live ... But what we really didn't do enough of was say how it linked to the job and how the job linked to the wider organisation and that if you make a mistake here are the ongoing implications downstream or if there is an issue with your business this is what could have caused it from before... someone before you is actually putting data in.*" In contrast at ManB "*the focus was to identify the effects of change both on the business and the people doing the work. That was very carefully managed*". Rather than distributing special newsletters and flyers ManB used the existing communication mediums in the business. The change process also "*focussed on personal contact and knowing how the politics works ... a lot of meetings with the people we knew were the shakers and movers - the ones that influence opinion*".

In both companies it was hoped that through the use of SAP there would be business process improvement over time, and hence increased business benefits. Data from the case studies indicated two main impediments to achieving this aim. The first was poor process controls. At ManB any suggestion that the information coming from SAP was incorrect was challenged and checked: *"Basically, it hit the fan, where there were poor management practices, they were flushed out in the early days. SAP was accused of actually having wrong numbers. We went through, did a whole lot of work as to whether the configuration was right, whether the reporting was right, all those sorts of things. Time and time again it was proven that the system was doing what the system should do and that the poor practices were very much made visible and led to improved practices over time."* The second impediment was the knowledge of SAP that managers and users possessed. As the following quote illustrates, business improvements cannot be achieved unless appropriate resources for training and support have been allocated in the post implementation period. "*Now unless we know what it* [SAP] *is capable of doing you are not going to know what you can do better. So that's one and I really think that's the key one*."

In order to realize the maximum business benefits from their ERP systems companies need to improve their business processes. Both of the companies in this study chose a system replacement approach to their SAP implementations. This means that rather than seeking to transform their businesses they were using the technology to "reinforce the institutional status quo, emphasizing standardization, control and efficiency" (Orlikowski, 1992). For example, standardization at BrandX was achieved by choosing to implement in SAP the best practices of its constituent businesses, and both BrandX and ManB moved towards more standardized staff induction and training. Control was achieved by the increased accountability users were subjected to with the use of SAP. Efficiency was achieved by SAP enabled shared services in both companies. With a system replacement implementation approach improvements to business processes can only come in the post implementation period. A precursor to improving business processes is having well-trained managers and users, who understand both SAP and the business, and who, with this combined knowledge can work to achieve the maximum business benefits.

On the basis of the results presented above the model shown in Figure 5 was developed. The business benefits from the ERP system do not come from the software alone but from how well the software is used by business managers and users in the post implementation period. Although education, training and support and change

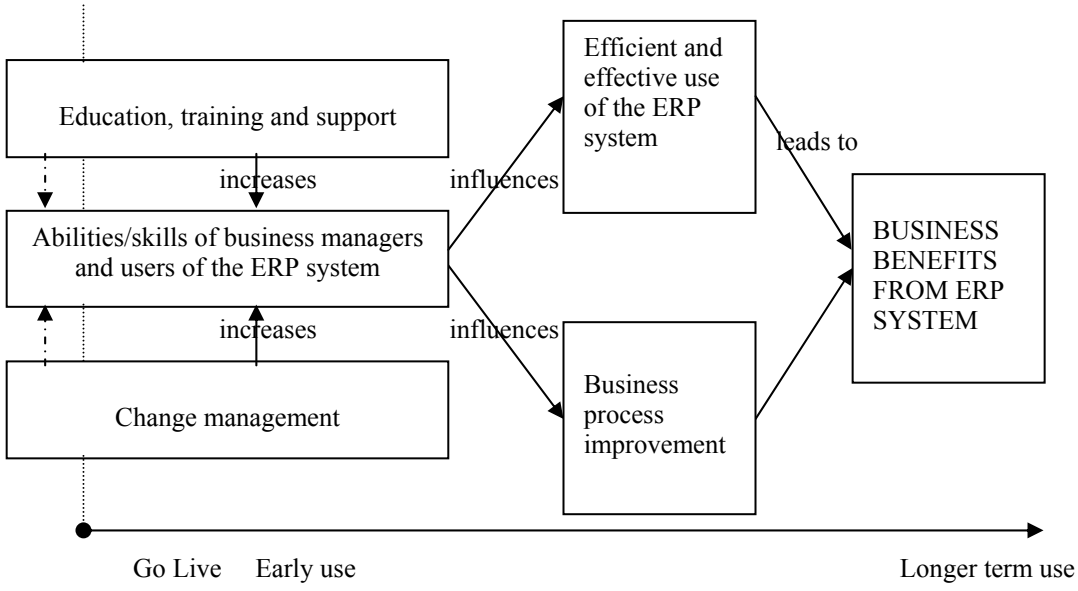

Figure 5: Achieving Business Benefits from ERP Systems in the Post Implementation Period

management are commenced prior to go-live it is not until the system is in operation that business managers and users feel the full impact of the change. After go-live there is an ongoing need for education about the implications of the integrated nature of the system, the importance of data quality and the capabilities of the system. Training and support are needed to ensure that the ERP system is used efficiently and effectively. Even with a system replacement approach to ERP implementation many work roles change and there is an ongoing need for an effective change management program to identify these changes and allocate training and support where necessary. Business managers already have a good understanding of the business. Business process improvement will occur as business managers increase their understanding of the ERP system's capabilities through the education process, thus changing work roles and again providing a need for ongoing change management. Provision of ongoing education, training and support and change management will increase the skills and abilities of business managers and users. This in turn influences how effectively and efficiently the system is used and the extent of business process improvement, which in turn leads to business benefits for the organisation. However, for this improvement in business benefits to be achieved increased resources are required in the post implementation period. In their study of manufacturing organisations Ross and Vitale (2000) also found that inadequately resourcing the post implementation phase limited the business value achieved from ERP systems.

CONCLUSION

Three new business benefits are proposed for the Shang and Seddon (2000a) enterprise system framework. At the operational level the SAP software enforced accountability through increased visibility. This characteristic has been reported in information systems in general (e.g. Zuboff 1988), and in other studies of ERP systems (Sia et al. 2002). The second new business benefit is in the IT infrastructure dimension. The SAP implementation has broadened IT staff skills and this has resulted in improved IT infrastructure risk management. The third is an organisational benefit from the use of one type of software. Both BrandX and ManB reported benefits from more standardized staff induction and training due to the use of SAP.

The business benefits achieved in these two organisations varied not only between different functional areas (Shang & Seddon (2002a) but also varied from location to location. These findings are consistent with an emergent perspective on organisational change (Markus & Robey 1988). The business benefits achieved are situated in a specific social context (e.g. location) and are dependent on the interactions of individual users and the SAP software, resulting in varying outcomes.

This study showed that ManB achieved more business benefits than BrandX. ManB entered the post implementation period with the following critical success factors i.e. "Small Bang" implementation, best business people on the implementation team and minimal customisation of SAP. In addition ManB had been using SAP for longer than BrandX had when the business benefits assessed. The period of on-site support after go-live although slightly longer in ManB, was still insufficient in some areas. There is evidence to suggest that a lack of resources to provide on-going change management, education, training, and support in the post implementation period has impacted on both efficient and effective use of the SAP system and business process improvement, and consequently the maximisation of business benefits in both organisations. The model in Figure 5 above is proposed to explain how organisations that choose to approach their ERP implementations as a system replacement can maximize the business benefits achieved over time.

A major limitation of the findings from this research is that only two organisations were studied. Future work will involve examination of the post implementation periods of ERP systems in another two manufacturing organisations with the aim of further understanding and explaining why some organisations gain more benefits than others from their ERP implementations.

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