

Using ERP as a basis for Enterprise application integration

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Abstract

Architecting and implementing e-Business supply chain solutions across and within the modern day enterprise, is now becoming a necessity in order to maintain competitive and be adaptable to market needs. As such, the integration of information and processes is a vital step, using technologies such as using Enterprise Resource Planning (ERP), Supply Chain Management (SCM) and enterprise portal platforms. The effective sharing of resource planning and other enterprise related data across and within the enterprise is typically seen as a facet of a business to business (B2B) platform. However, such infrastructures typically involve a tight integration across intra and inter-organisational systems. This paper examines an Enterprise Application Integration (EAI) initiative taken by a global manufacturer of industrial automation products, which attempted to utilise ERP as an integration tool across its internal B2B infrastructure, to achieve such an aim. This paper discusses those integration considerations and complexities, experienced by the case company upon embarking on an EAI integration programme through the adoption of a core ERP as a catalyst for organizational change. In doing so the authors present an analysis of the inherent risks and limitations of this approach in terms of previously published literature in the field, relating to technology-driven organizational change and EAI impact and adoption frameworks.

Keywords: ERP, EAI implementation, Change Management, Organisational Change.

1. Introduction

Over the years, Enterprise Resource Planning (ERP) systems have emerged, as systems that enable organizations to manage their core business process data and information across the enterprise (Rao, 2000). Such systems were originally designed and implemented in order to solve the fragmentation of information in large businesses and integrate intra-and inter organizational information flows, although it has clearly not been a panacea with respect to solving inherent legacy application integration issues (Linthicum, 1999).

As a result of the expansion and subsequent deflation of the internet dot-com bubble, which created and led to a rapid uptake of business-to-business (B2B) models, the importance of coherent and consistent ERP integration (Eschinger *et al.*, 2000), as well as the re-engineering of supply chain infrastructures with operating business models (Childerhouse and Towill, 2000), was highlighted. Indeed, it is widely recognised that businesses can no longer effectively compete in isolation to their suppliers and customers, and as a result are beginning to interact and support their supply chains to achieve competitive advantage, via such integrations. The concept of extending the functionality and visibility of the supply chain based upon core ERP and web portal platforms, has long been seen as the precursor to enabling the so-called digital enterprise, and extending the reach of a IT/IS-centric organisation (Tapscott *et al.*, 2000). B2B platform architectures satisfy this aim through providing communication and automation of business processes across and between enterprises, enabled through messaging and information brokerage technologies. In order to deploy business process-related content and context effectively, B2B solutions provide a single view of the enterprise that is secure, scaleable and integrated with business processes across enterprises, via Enterprise portals which aggregate content and services. B2B integration of legacy/ERP applications and processes are considered key to extending the enterprise to enable better services and processes and to lower operational, production and inventory costs (Themistocleous *et al.*, 2000). Customers wish to compress the fulfillment cycle as far as possible (full or partial delivery patterns, warehousing optimisation, production planning), and hence supply-chain oriented organizations need to combine their production and logistics operations into a single entity, in order to maintain their operational efficiency.

Alignment of the fulfillment and delivery processes, for example, clearly involves a high degree of back-office integration, which can only be satisfied by tight supply chain integration with core ERP. Integrated supply-chain and market place services which arose at the mid-point of the dot-com boom during 2000 – 2001 such as CoviSint (otherwise known as Digital Market Places, DMPs and Net Market Makers, NMM), were based on this notion, which sought to enter and support vertical / horizontal supply chains, through aggregating transaction-related information (Tapscott *et al.*, 2000). Figure 1 shows an example of a sales-led process based upon this concept, which the case study company described in this paper, wished to employ as the basis for its internal B2B platform.

Insert Figure 1 here

Hence, the implementation of an operational supply chain mechanism that can complement and add value to enterprise business processes, has been a key driver for the adoption of resource planning systems across the enterprise (Chung and Snyder, 1999; Davis, 1995; Rao, 2000). However any such system, should also support business-critical decision-making tasks, and be underpinned by an enterprise-wide IT/IS infrastructure. Therefore, in order for modern day organisations to develop and grow, requires that not only such information is available, but also requires a flexible supply chain, and resource-aware IT/IS (i.e. capable of reporting on demand and forecast data), closely aligned with the organizational structure and be controllable based upon the needs of the business.

There is often a time lag before the benefits or dis-benefits of an ERP system can be readily determined (Zrimsek and Brant, 2000), as the implementation and adoption of such an IT/IS, can be a time consuming and costly exercise, requiring a significant change in working practices, policies and systems. The internal business environment within which most ERP systems operate, also makes measurement of the success and / or failure of the adoption of ERP difficult, due to the effects of change on both people, processes and technology. Furthermore, the philosophy behind ERP implementation has tended to place an emphasis on the resultant establishment and operability of the system, as opposed to providing a mapping between business continuity, improvement and stakeholder involvement (Larsen and Myers, 1999). It is apparent that there is a high degree of dependency on ERP in order to achieve the aim of a fully connected and integrated enterprise supply chain.

Hence, in order to understand and put these ideas into context, this paper presents a case study of an industrial automation products organisation, Company X, which embarked upon an internal B2B EAI initiative in this light. This initiative was initiated by senior management, in order to showcase first internally, then later externally to their customers, how their manufacturing and process automation software could be integrated together across their product range, based upon a core packaged ERP implementation.

The ERP itself would be central to the provisioning of business process flows across the enterprise, amongst stakeholders of various interconnected systems (hence the application of an “internal” B2B concept). Through describing the intricacies of this, essentially, EAI change programme, the authors analyse the given internal B2B concept proposed by the management of Company X, in relation to recently published work in the area of technology-driven organizational change (Markus, 2004), EAI impact (Badii and Sharif, 2003; Sharif *et al.*, 2004), and EAI adoption (Themistocleous, 2004). As such, the remainder of the paper is structured as follows. Section 2 provides a brief overview of the research methodology and research design in order to capture the case data. Section 3 presents a description of the case company and the resulting approach used in order to carry out an ERP integration within the organisation. Section 4 analyses and discusses the outcome of the approach taken by management, and subsequently assesses this approach in the light of published IT change and EAI impact and adoption models. Finally, section 5 provides a summary of the research given, with recommendations for organisations wishing to embark upon such internal enterprise application integration projects.

2. Research Methodology

For the purposes of the research presented within this paper, an interpretivist qualitative case study approach was used (Yin, 1994). This stance was applied in order to make sense of how the case study company wished to implement their EAI solution, using an ERP system as the core component. Furthermore, the qualitative nature of the research methodology used, allowed the authors to carry out a logical and progressive analysis of the case data, via a descriptive narrative (in the form of Mumford, 1993 and Walsham, 1993). In doing so, the authors were able to examine the effect of approaching EAI from an ERP perspective, within the confines of case study company's natural setting. The research protocol used was primarily that of direct observation as well as semi-structured interviews of case study participants (ranging from senior management to IS development staff), and also access to documentation relating to the EAI initiative, undertaken within the case company. In order to overcome the effects and risks of bias inherent in such a case study approach, the authors adopted a similar triangulation approach as used by Themistocleous (2004), i.e. data; methodology and interdisciplinary comparison.

3. Case Study : Integrating ERP within the enterprise

The case study company investigated by the authors, is an internationally renowned Global industrial products company (herein known as Company X). The company has experienced both organic as well as merger-led growth over the last decade, rising to become a leading organisation for the provision of industrial automation process monitoring tools and systems. Over this period of time, Company X acquired a number of smaller independent companies and vendors of supply chain, process monitoring and quality control software. As such, Company X boasts a large portfolio of such systems which it actively engages to market and sell to its existing customer base of manufacturing companies. Company X is unusual in that it not only sells a range of products for this sector, but also heavily utilises some of its own products itself in running the business, much akin to the philosophy adopted by Oracle Corporation (Stone, 2002) and Cisco (Bunnell, 2000) in using their own systems in-house. The primary business lines of expertise that Company X focusses on are Enterprise Information (scorecard and business performance metrics); Automation and Control (numeric control of flexible manufacturing cells); Manufacturing Execution (automated assembly and production monitoring systems); and Safety (hazard detection, evacuation alert and environment monitoring systems). At the time of writing, Company X has approximately 15 such systems which feed into the both the production planning and fulfilment processes, and involve a tight integration with their core ERP (as shown in Figure 2).

Insert Figure 2 here

These information systems essentially provided the manufacturing plant process control and production managers, with a suite of automating monitoring tools, which would be able to feed into the production scheduler within the ERP system. The ERP system, originally SAP R/3, was seen to be the driver behind aggregating and

consolidating business process information for Company X. However, as a result of the purchase of the companies that were producing the ManuWare and SuperPak software products, there was a need to support the underlying ERP requirement of those packages (namely Baan ERP). By bringing these two systems into their product line, Company X immediately gained an advantage over its competitors in the area of process and machine interface control. Coupled with their market leading position in enterprise management and safety-critical systems also, this presented an even more competitive advantage to them. Thus, this opportunity was seen as a harbinger of potentially massive growth to the company, which could not be ignored. Additionally, the organisation was faced with the prospect of upgrading and maintaining its current SAP R/3 product internally, which was looking to be a significant cost outlay. Given these pressures and also the better fit of Baan ERP to process and discrete manufacturing environments, the board of Company X, decided to adopt Baan not only as their own internal core ERP, but also as the basis of their software products also.

As such, an Enterprise Application Integration (EAI) project to enhance the integration between the organisation's order entry, planning, production and order tracking and logistics was initiated by senior management, to be undertaken. The project would involve the delivery of an internal B2B "portal" concept, using Baan as the core manufacturing process ERP system in order to aggregate core planning and fulfilment information for customer orders, across a multitude of stakeholders. As a result, management stated that the system should achieve break-even within 12 months, and operating margins should be at a maximum of 10% of income within 24 months. By providing access to key stakeholders and influencers within the organisation, such tracking and order resolution information, could then be made available to management. Thus, senior management stated that the aims of this initiative were to:

- *Achieve financial stability and market credibility:* continue to be a leading player in the field of industrial automation software systems, via innovations in process and discrete manufacturing integration;
- *Accelerate web enablement and build a working B2B solution:* Successfully implement and adopt Baan within the organisation (implement core ERP) – integrate existing industrial automation (process manufacturing and monitoring software) to the core ERP via portal and EAI technologies: become the "Cisco of this market";
- *Evolve to a more successful customer-centric company:* Provide a flexible IT/IS infrastructure in order to allow key stakeholders and management to monitor and manage the business;
- *Establish Baan ERP / integrated manufacturing IS reference sites (internally and externally):* Initiate and lead implementations of an integrated industrial products B2B platform, inside and then potentially outside, Company X's customer base (involving the use of external consultants to assist in the implementation of this EAI approach).

In the words of the managing director of Company X, the B2B portal was to be:

“...part of [our] strategy of being able to provide support from factory to boardroom...enabling us to offer the full range of B2B software for manufacturing business to connect the shop floor worker...with customers and suppliers.”

The integration programme was to begin, by first of all successfully implementing and configuring the packaged ERP within the organisation (in this case, Baan). Ultimately, the information contained in the portal, along with a systematic decommissioning and system rationalisation programme, would be able to lead to short-term improvement of estimated lead times. Componentisation of ERP modules along the lines of ERP II, would also allow the implementation of the ERP package to be faster as each ERP component could be isolated in terms of core data dependencies.

Following this, existing interfaces from each of the source systems across the product range would be modified to transmit messages to the core ERP system, whenever a business level event (BLE) would occur via a dedicated XML interface. For example, if a build-to-order (i.e. configuration) request would enter a part of the internal B2B “network” of systems from the B2B integration portal, this request would be routed through the ERP system first of all and then would be actioned as appropriate by the relevant component package within the organisation. This is in line with how present order fulfilment functionality currently works (Sonderegger, 1999 ; Souza, 2000). Through routing this information directly through the ERP system, this would provide a distinct mapping between the selection of configurable product components, with actual supply and demand data, in terms of the production forecast cycle (a direct feed from the ERP system). An example flow within a fulfilment cycle is shown in Figure 3, where the arrowed lines show the business process flow and the dotted lines denote the dependency upon the core ERP.

Insert Figure 3 here

By then combining interface data from the master production schedule and testing databases, the portal would also be able to provide information to the customer on likely shipping dates for each configured product. For Company X, it was equally important to define the key processes which contained planning-to-delivery dependent information. This not only involved deciding on which systems needed to be decommissioned and consolidated, but also which stakeholders should have access to the flow of information as a result of the integration effort. The approach used to integrate both legacy, ERP and web interfaces was to involve a wide combination of technologies (including XML, Java and proprietary software interfaces). This is shown in Figure 4.

Insert Figure 4 here

In this simplified view of the proposed B2B solution, an order from an internal (or external) customer is routed via a sales person (1), who enters this information into the portal, which triggers a business level event (2). This BLE is then routed through the CRM module and sent to the core ERP via an XML message (3). This information is then split up and data sent to the relevant ERP component (Materials Management, MM, etc). The result of this is then sent back via the XML interface (4) to the automation control system (5), and the cycle is run until the order completes (6). Exceptions thrown in any part of this business process, such as stock shortage or forecast window being exceeded, are handled via the enterprise management software (7) – this being raised in terms of scorecard and organisational performance metrics, viewed by management.

Senior management realised, that if by integrating information across and within their industrial automation software product line, via a core ERP package, potentially both suppliers as well customers could be able to see the state of the build, design, forecast, production and control cycles more easily. As such this was a business proposition which could ultimately be sold to their customers, to allow them to see the benefits of a fully integrated, interconnected enterprise (Tapscott *et al.*, 2000).

4. Assessing the impact of the ERP-led integration approach

In attempting to achieve a realisation of this internal supply chain portal, Company X immediately faced obstacles and encountered limitations. Considerable effort had to be expended in order to integrate and consolidate the core business process applications (not least of which, was replacing their existing ERP package, SAP, with Baan). As an ensemble effort, the application development and rollout of the system was scheduled to be delivered within an aggressive timeframe of 12 months. The initial scoping and definition of the integration effort required, took 6 man months alone to complete. Such estimates were driven and mandated by senior management, with almost a disregard for the active and necessary involvement of technical and operational IT/IS managers within the divisions concerned. For example, an internal stakeholder commented that although the overall supply chain was now highly regarded as being efficient for the customer, it perhaps highlighted inefficiencies in their own business processes which would be difficult / impossible to optimise further within the time frame given for the ERP-led B2B solution to be implemented.

Company X understood however, that the choice of ERP could have significantly effected the rate and ease of integration. The internal consulting team lead by the Chief Technology Officer (CTO) and senior IT project managers from each of the product line divisions, concurred that making the right choice in terms of selecting an appropriately flexible ERP system which is amenable to supply chain integration, would decide the success and / or failure of the project. However, senior management persisted in making a switch to Baan ERP, given its stated aims at the behest of the managing director. The apparent disregard for the inherent risks associated with the vigorous and aggressive timescales suggested by senior management, did not take into account the severe change management issues which would be encountered. As such, the proposed B2B portal concept and EAI implementation was shelved after a

period of 6 months as it became clear, that the successful adoption of Baan internally in order to achieve “reference site” status, was not achievable. Also, product line heads (such as for Enterprise Management and Automation) were also concerned about the extent of effort required in order to integrate and standardise their product lines with Baan (which had not even been fully implemented as a core ERP within the company).

Thus, in assessing the extent of the failure of this ERP-led integration approach, the authors now present a set of complementary techniques which highlight specific aspects of the proposed approach by Company X. In doing so, this *post-hoc* EAI analysis process involves a combination of three conceptual approaches: the technochange model suggested by Markus (2004); an EAI impact framework (Badii and Sharif, 2003; Sharif *et al.*, 2004); and an EAI adoption framework (Themistocleous, 2004). This is shown in Figure 5.

Insert Figure 5 here

4.1 Strategic change management : the TechnoChange model

In the light of the recent work by Markus (2004), involving the definition and exposition of technology-driven organisational change – Technochange – we can characterise that Company X exhibited some of the risk characteristics of a technochange project. To recap, Markus defines Technochange as organisational change driven purely by the capabilities and realisable benefits of an IT/IS solution. Furthermore, such initiatives are usually expected to produce significant improvements in organizational outcome measures such as process efficiency or cycle time (Markus, 2004, pp.6). In the case of Company X, whilst the remit of the ERP-led EAI programme was wholly technical in nature, the indirect (and some would say direct), effect of their proposed approach was to change the way in which the company was to operate. As shown in Figure 1, this amounted to integrating systems vertically through the organisation as a result of the adoption of a core ERP system, Baan. In doing so, this approach would indirectly have lead to a bootstrapping of the horizontal business processes integrating business processes from manufacturing through to management tasks, “from shop floor to boardroom” (as shown in Figure 4).

This was also a stated aim by management at the time, in terms of the objective of achieving financial stability and market credibility. Furthermore by attempting to exploit the nature of their chosen core ERP, Company X were also inadvertently satisfying another of Markus’ criteria : that of aligning new business processes with new technology in order to engender change. However, a key discriminant in technochange projects as compared to typical IT projects, is the level of benefits/risk encountered. These are respectively: a project yields the desired results (or there is a risk of non-use of IT); the solution implemented is used effectively (or there is a risk of misuse and non-benefit realisation); and the benefits of the solution are captured properly (or there is a risk of poor IT solution adoption). So whilst in principle the B2B EAI initiative was in the spirit of a technochange programme, the lack of realisation of any of the benefits, supported the fact that the initiative was poorly constructed and ill-conceived, in terms of underestimating the extent of change relating to replacing SAP with Baan ERP.

4.2 Value chain analysis : an EAI impact framework

Given that the ERP-led EAI initiative was aggressively driven by management, but failed due to the inadequate realisation of project risks, what could have been the impact of the project if it had succeeded? Although this may seem like a trivial and perhaps even nonsensical question, it is interesting to see whether or not the stated objectives of the project were realistic in terms an analysis of key value chain components within an EAI impact framework. Figure 6 shows such a model with respect to Company X.

Insert Figure 6 here

Based upon the previously published framework (Badii and Sharif, 2003; Sharif *et al.*, 2004), the details are given for Company X. This provides, at a glance, a summary of all of the key aspects of the change required and the resulting impact upon the supply chain, hence in this case the product lines of Company X. As can be seen from the diagram, the key value drivers (from the right hand side to the left hand side), predominantly centre around those factors relating to the overall corporate strategy, leadership of the organisation and market differentiation messages as stated by the board. Technology obviously plays an important part in this model also, whereby the chain is underpinned by the key driver of the core ERP (Baan), the requirement to integrate the product line software (15 subsystems) and the integration requirement of the B2B portal infrastructure. Customer value (the area at the top of the diagram) centres also around technology platform, as well as highlighting the importance of managerial oversight through the use of enterprise (performance monitoring) management. In comparison with the original, base EAI impact framework, it is found that there was little indication of organisational and people factors – both in terms of risks and benefits. The only risks and benefits cited in terms of the ERP-led integration, were wholly in terms of the technology and overall, somewhat generic, market and competitive differentiation strategy. Hence through analysing the impetus behind this initiative within Company X, we can also allude to the fact that people-related integration issues were simply not included in the scope of the project (effect of change, skills and training required).

4.3 Operationalisation of EAI : an EAI adoption framework

A final tool that is useful in assessing and analysing the extent of the integration project at Company X, is that of an EAI adoption framework as defined by Themistocleous (2004). Within this adoption framework, risks, benefits, costs as well as operational, tactical, strategic, technical and organisational aspects are taken into account. Similar to the impact framework in the earlier section, this model provides further detail of the scope of the EAI within an organisation. Specifically, it provides the necessary detail in order to suggest the actual effects of realising, hence adopting, such an EAI approach, and is shown in Table 1.

Insert Table 1 here

As can be seen, the costs relating to adopting this approach largely centre around the licensing of the core ERP product and associated training (as would be expected). An additional organisational cost not typically taken into account until after ERP has been adopted (Larsen and Myers, 2001), is that of headcount adjustment. In order to maintain and grow the business, with the given aims of management, such a cost control measure becomes inevitable. Key barriers to the adoption of this EAI programme also lie with the effort required to align the product lines with Baan and also the fact that such an *internal* integration project had never been carried out before. This barrier is essentially a risk in that Company X had little or no realisation of the extent to which it had the sufficient and necessary in-house skills to manage and execute the programme.

The internal pressures present within the organisation ultimately tempered the potential benefits also. For example, in order for Company X to be more customer-centric, it would eventually have to reorganise its product lines and integrate with Baan and so forth. Hence, the key to adopting the ERP-led EAI solution within Company X, involved a juxtaposition of implicit organisational change factors (aligning product lines, restructuring and running the business). These factors were almost subsumed within purely IT/IS considerations about how to enable the organisation through ERP-based integration. Thus, Company X was unable to even begin the programme of change due to this lack of organisational inertia.

5. Summary and recommendations

This paper has attempted to describe via a case study example, the core issues faced in an ERP-led EAI initiative within a Global industrial automation products organization. In doing so, the authors highlighted a proposed integration plan and model that Company X wished to implement, but was unsuccessful in completing due to the complexity and effort required to both adopt a new ERP system and integrate it with existing internal applications. Using published research of models based upon technology-led organisational change and EAI adoption, the authors were able to highlight the fact that by focusing and relying upon ERP to deliver integration benefits alone, Company X was not able to realise their internal B2B concept. This was due to project risks not being taken into account at the expense of realisable benefits suggested.

Without understanding and noting the importance of the consequences of technological change as defined by as well as operational change to the business to accommodate ERP across all business divisions and processes, such an integration becomes impossible, even if supported and mandated by senior management. Inherent and implicit EAI project risks were highlighted in terms of both a strategic technochange view, and the associated value chain-based EAI impact and adoption frameworks (respectively : Markus, 2004; Badii and Sharif, 2003; Sharif *et al.*, 2004; Themistocleous, 2004). As a result of the mode of analysis used by the authors, an overall process framework for assessing technology-driven EAI was therefore also presented (in terms of strategic, value chain and operational models).

As a result of the findings in this research, the authors suggest that organisations who wish to successfully embark and complete integration projects internally, should not adopt such an ERP-led approach to EAI. At the most fundamental level, it should be

bourne in mind that any EAI initiative is not only an IT/IS programme, but is a form of technochange programme. In other words, a change scheme which engenders an implicit change in the organisation itself. The risks involved in terms of both IT/IS and organisational components of any such plan, should therefore be assessed prior to initiation of any EAI project. Hence, a primary form of risk within such projects is that attributable to IT/IS sophistication: complacency relating to technical capability and skills increases the risk of incompleteness of the task. It goes without saying that understanding and having a detailed appreciation of the internal IT/IS is paramount – thus the importance of IS evaluation should be considered as a pre-requisite for such projects also. Although ERP-led integration within the enterprise is a novel and alternative approach to integrating information and processes, it requires not only technical skill but also maturity of judgement.

This is in the sense of being able to distill and extrapolate those risks highlighted in the sections earlier, and realise the impact of making decisions about the IS infrastructure based upon them.

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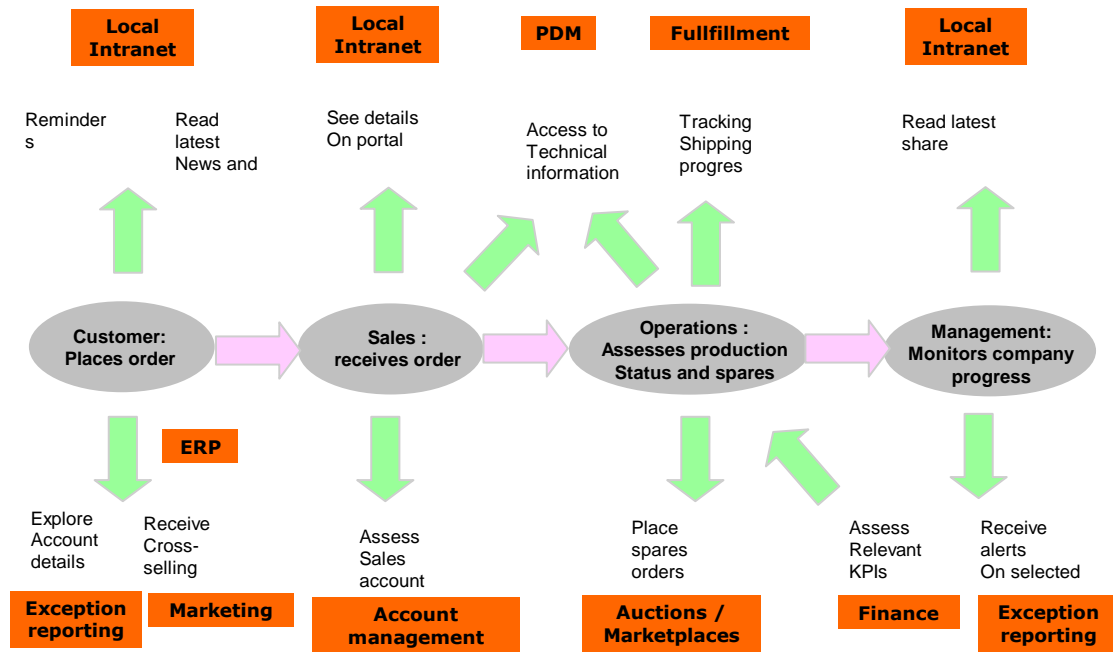


Figure 1. Example flow of supply chain information within a B2B platform

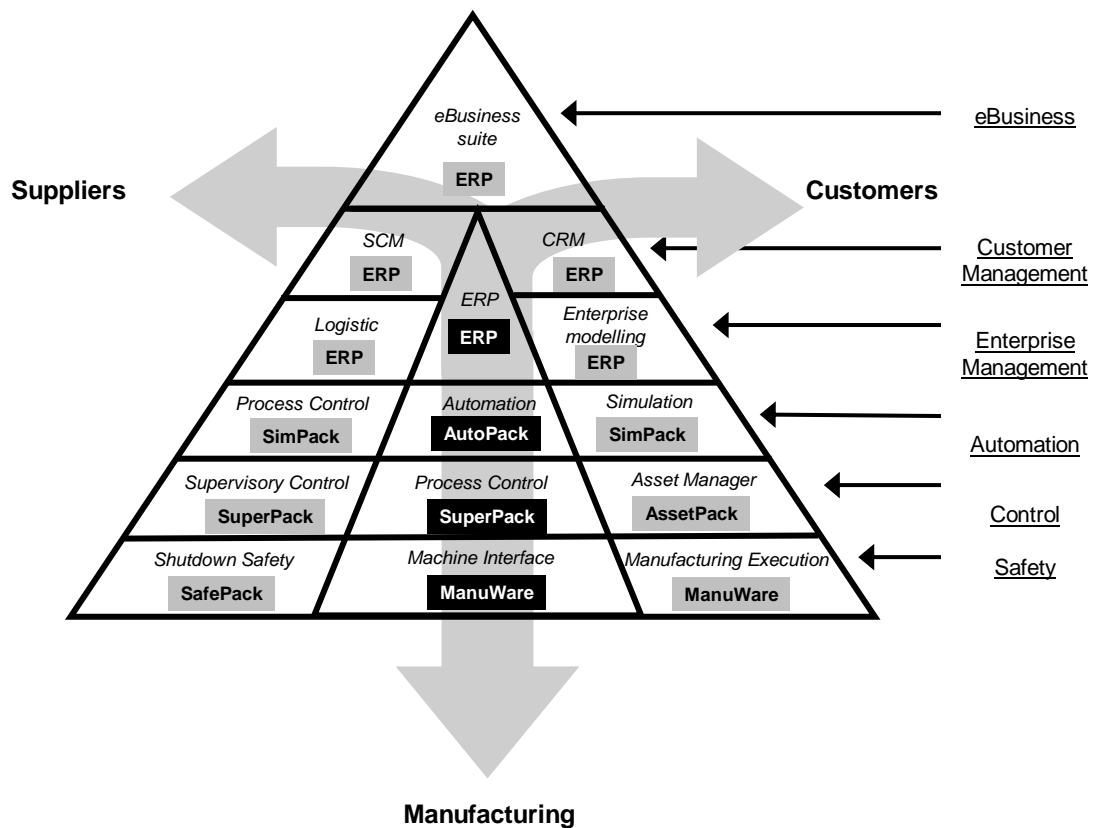


Figure 2. Enterprise integration infrastructure and key systems in Company X

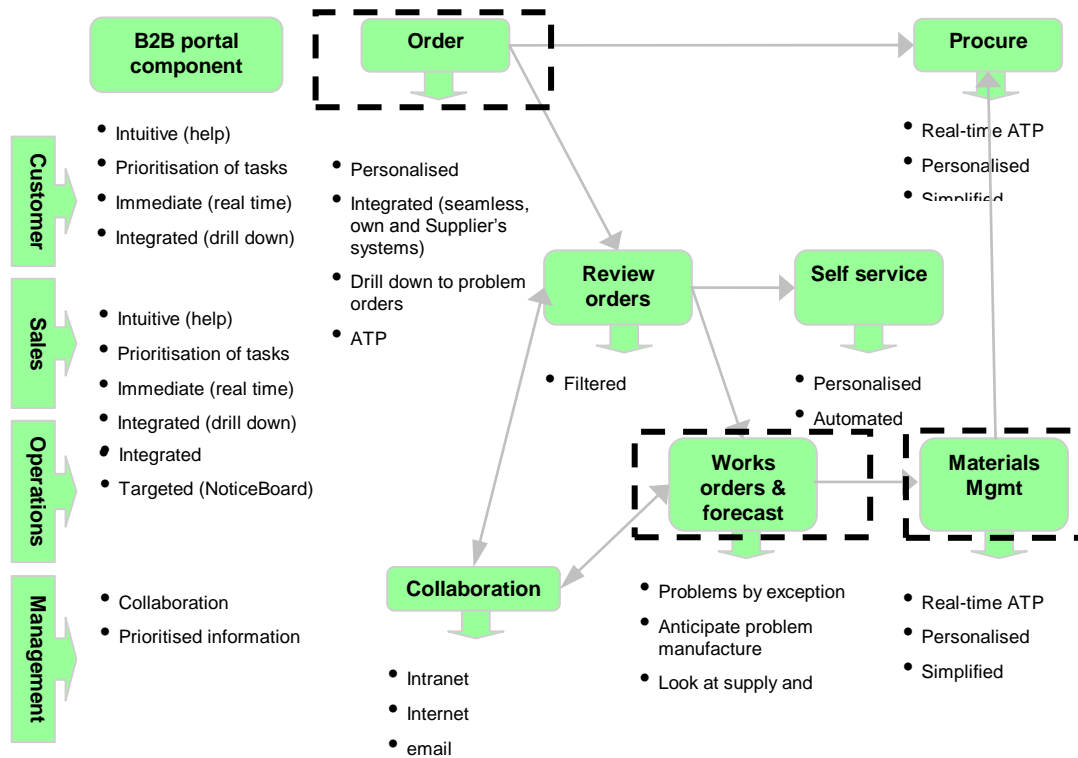


Figure 3. Fulfillment cycle flow – ERP integration dependency

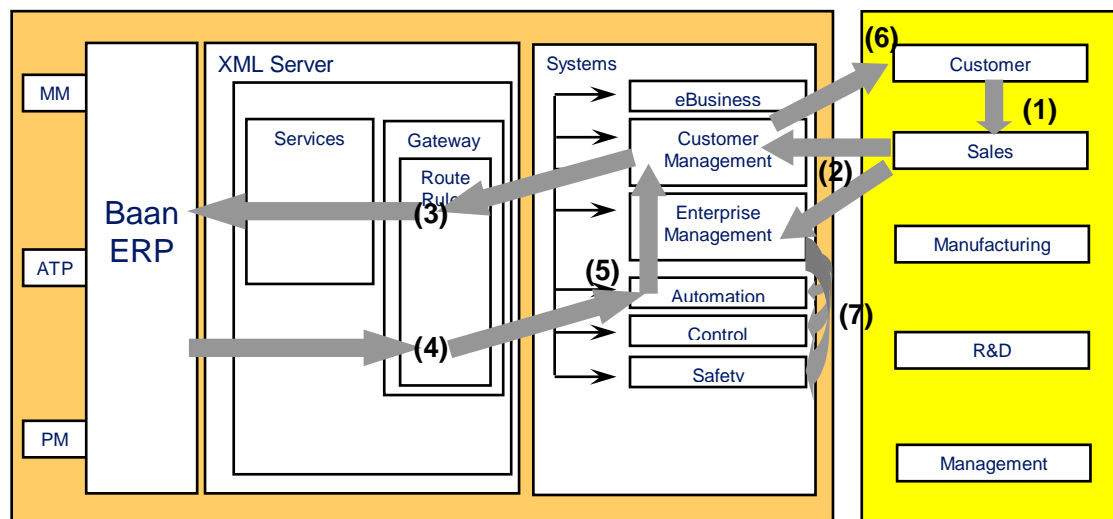


Figure 4. Company X proposed ERP-based EAI solution

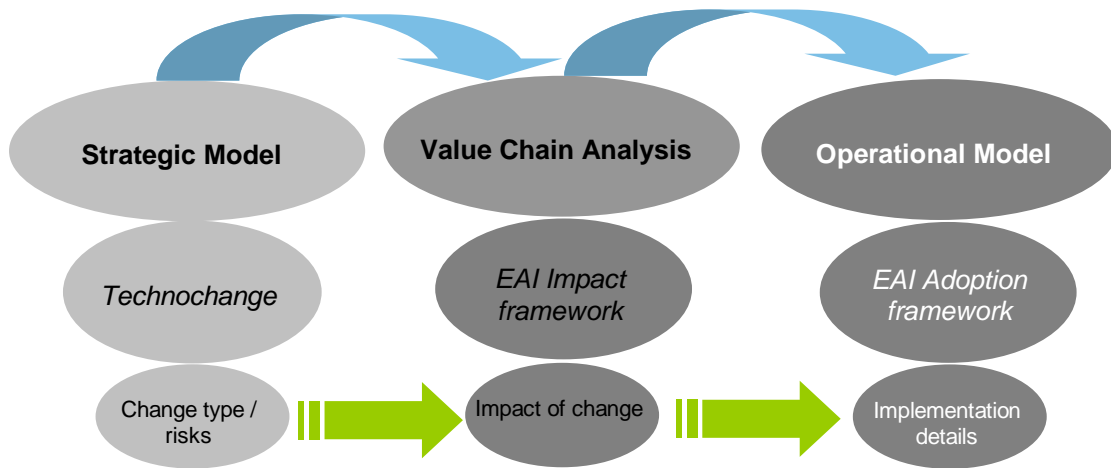


Figure 5. Post-hoc EAI analysis model

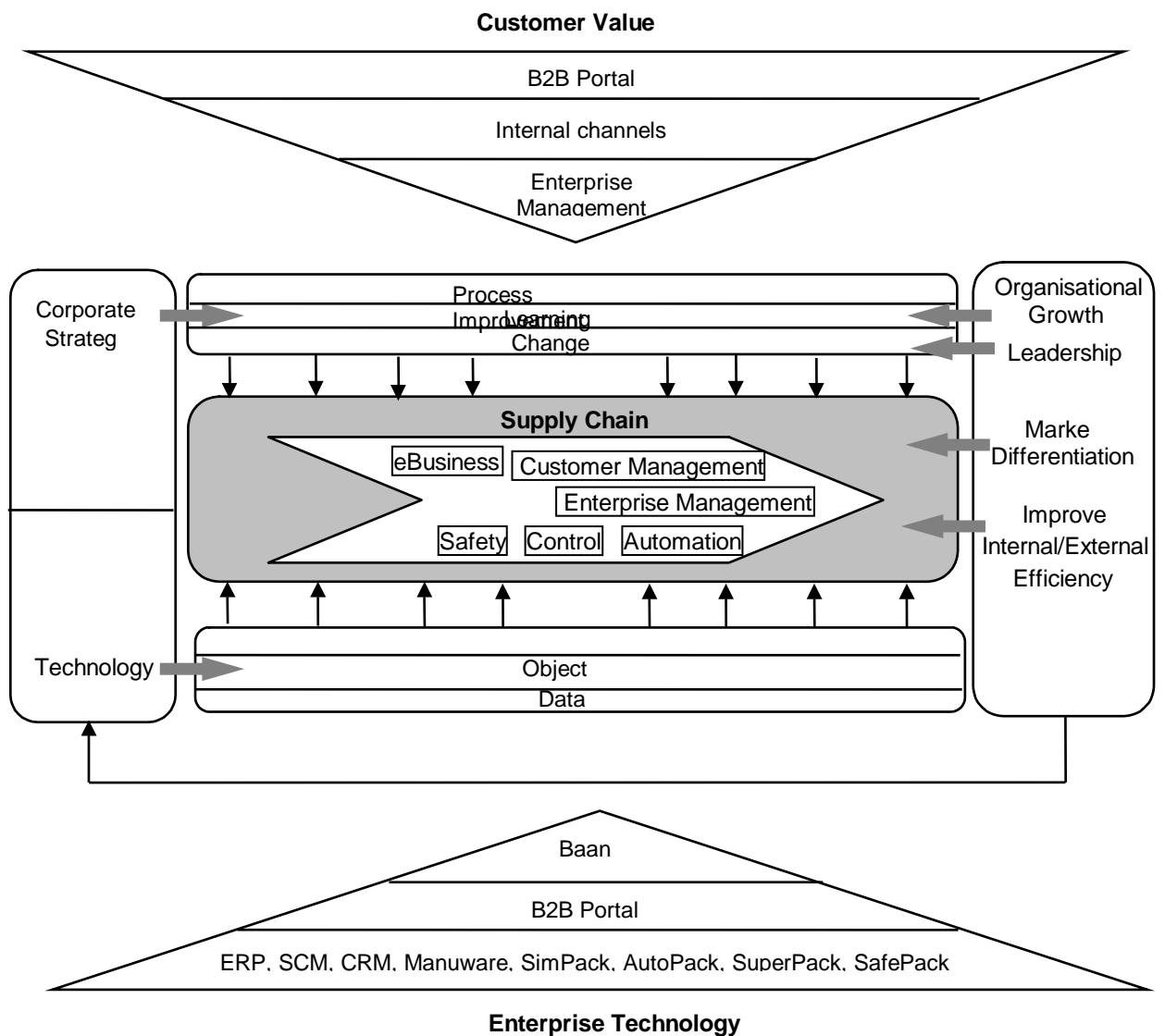


Figure 6. EAI impact framework for Company X

Table 1. Mapping Company X data against the EAI adoption framework

EAI Adoption framework	
Costs	
<i>Direct</i>	Capital outlay on Baan licensing; XML service development, integration and provisioning (using both internal and external consultants), hardware costs (servers and infrastructure)
<i>Indirect</i>	Training and learning for existing staff (Baan and effective use of the ManuWare, SafePack and AutoPack products)
<i>Organisational</i>	Possible restructuring of product lines (and headcount) as a result of the introduction of Baan
Barriers	
<i>Organisational</i>	Existing product lines not integrated with SAP R/3
<i>Managerial</i>	Resistance to change within the suggested period of the implementation
<i>Strategic</i>	None evident
<i>Technical</i>	Large effort required to integrate 15 main subsystems
<i>Operational</i>	Little experience of such handling of an internal change programme
Benefits	
<i>Organisational</i>	Become more customer-centric and product line aware
<i>Managerial</i>	Increase efficiency, and line-of-sight of core internal business processes
<i>Strategic</i>	Internal reference site will showcase capability to internal and external customers and stakeholders
<i>Technical</i>	Grow integration expertise: standardise a roadmap for the integration of industrial automation software systems
<i>Operational</i>	Increase efficiency, and line-of-sight of core internal business processes
Internal Pressures	
<i>Organisational</i>	Reorganisation of product lines around Baan core ERP
<i>Managerial</i>	Control and align costs of integration, with strategic aims of the initiative
<i>Strategic</i>	Return on investment expected within a 24 month period: become a leading player in the integrated industrial automation software systems field
<i>Technical</i>	Establishment of internal Baan reference site: full configuration and application integration using XML to communicate with existing packages; development and setup of an internal B2B platform: integrate reference architecture with a portal front-end
<i>Operational</i>	Continue to run the business while ERP-led EAI is carried out
External Pressures	
<i>Competitors</i>	Not applicable – internal focus only
<i>Partners</i>	Not applicable – internal focus only
IT Sophistication	
Experience of industrial automation and control systems, spans 15 years	
IT Infrastructure	
SAP R/3 based core ERP; internal LAN intranet ; mix of proprietary and legacy automation systems (eBusiness, Enterprise Management, Customer Management, Automation, Control and Safety)	
Support	
<i>External Consultants</i>	RFP sent to 5 leading professional services organisations
<i>Software Vendors</i>	RFP sent to 3 proprietary XML server vendors