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# EXPLORING THE BENEFITS FROM B2B IMPLEMENTATIONS THROUGH ERP

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## ABSTRACT

*This paper reports on research carried out in 1999-2001 on the use of e-business applications in SAP-based organisations. Structured interviews were used to collect data on eleven established organisations from a diverse range of industries. The findings are analysed according to the level of sophistication of e-business models. These early adopters of e-business show a trend towards cost reductions and administrative efficiencies from procurement and self-service applications used by customers and employees. A complex case study of e-business integration with a global supplier and its corporate customers is analysed to identify specific antecedents for success. Collectively the set of case studies is used to demonstrate the increased benefits derived from an e-business architecture based on a network of ERP enabled organisations.*

## 1. INTRODUCTION

Enterprise Resource Planning (ERP) technology has been profoundly influenced and transformed by the Internet. Less than two years ago, the ERP paradigm was largely confined within the walls of the traditional business enterprise. The current Internet trends serve to extend the original value proposition of ERP, by breaking down organisational barriers. Now those boundaries have become almost obsolete. In the future, the structure of such organisations will be more like the web (Larsen, 2000). Internet technologies offer an ERP based organisation the opportunity to build interactive relationships with its business partners, by improved efficiencies and extended reach, at a very low cost (Hesterbrink, 1999). Organisations that fail to seize this opportunity become vulnerable as rivals establish themselves first in the electronic marketplace. They may eventually be forced to participate in Internet commerce by competitors, customers or consumers.

The early adopters of e-business applications show an initial trend towards realising the benefits from procurement, and self-service applications. For example, Statoil expects savings of 30% from a 2billion US\$ annual purchases bill; British BioTech has reduced the time to fill an order from 10 to less than 2 days; UBS Banking has an intranet for the internal organisation of 40,000 employees globally; and Siemens expects 25% of global sales from its e-shopping mall.

This paper reports on the findings from the first phase of a longitudinal study of ERP enabled organisations that pioneered the use of e-business applications. The research was carried out between

1999 and 2001, through semi-structured interviews. The objective was to identify the benefits and problems encountered by the early adopters of e-business applications with ERP (e-ERP) according to a set of business-to-business (B2B) interaction models. The findings are analysed according to the level of sophistication of B2B interaction. The level of sophistication refers to the extent of using e-business applications for the B2B interactions described in Figure 1. A case study of B2B e-business integration with a global computer supplier and its corporate customers is used to demonstrate a more complex business interaction model, supported by a network of ERP systems. Collectively the cases show that added benefits arise from an increased level of sophistication of B2B interaction.

## 2. E-ERP IMPLEMENTATIONS

An e-business implementation is from the outset aimed at integrating business processes with external business partners and is built on and supported by the ERP foundation. The main focus of the implementation will therefore be the integration of cross-company value chains using e-business tools (Kalakota, 1999). An ERP implementation has a defined lifecycle, typically 12-24 months depending on the scope and other parameters (Blain, 1999). After the initial implementation, upgrade and functional enhancement projects follow in irregular intervals. e-Business implementations need to be significantly faster than initial ERP implementations (Hesterbrink, 1999). However it can be expected that these activities will continue on an ongoing basis to accommodate changing relationships with business partners and enhanced functional and technical scope of existing relationships.

The importance of combining ERP packages with the Internet has a two-way benefit and return on investment. ‘Once Internet technology is efficiently integrated into the internal operation, its effective use for external interactions becomes a natural and easy extension. Without the internal infrastructure, external interactions will always be strained and limited’ (Telleen, 1996). Also, the coupling of these technologies is seen as ‘a shift from the traditional emphasis on transaction processing, integrated logistics and workflows to systems that support competencies for communications building, people networks, and on-the-job learning’ (Manville, 1997).

Although these technologies have distinctly different functions, integrated they offer a sound infrastructure for doing e-business. (Venkatraman and Henderson, 1998). Here e-business means “making the key business processes of an organisation available over the Internet” (Boey, 1999). In general, it is about electronic interactions between organisations. Although simple, this definition nevertheless incorporates some subtle but key points about e-business applications with ERP systems.

Figure 1 is used to illustrate how these concepts of e-business relate to a class of business-to-business (B2B) models that include; business to supplier (B2B<sup>S</sup>), business-to-employee (B2B<sup>E</sup>), and business-to-corporate customer (B2B<sup>C</sup>).

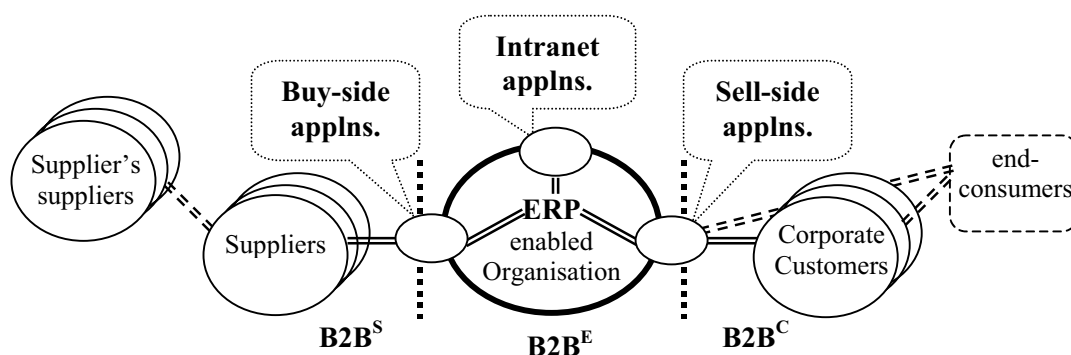


Figure 1: B2B Model of a Single ERP enabled Organisation

B2B<sup>S</sup> refers to a sub-set of B2B where the organisation’s employees have Web access to suppliers’ internal system. For example, materials catalogues and prices within the procurement agreements.

**B2B<sup>E</sup>** is viewed as intranet access for all employees to their organisation's ERP data, from anywhere, anytime (24x7). It offers transparent Web-based access to important policy, manuals and procedure documents across all departments. An intranet "also offers collective use of many functions. For example, employees can create individual homepages, collectively offering important information 'into' the organisation" (Perez et al., 1999: p.51).

**B2B<sup>C</sup>** refers to a sub-set of B2B where corporate customers and distributors have access to the organisations order system. B2B<sup>C</sup> is differentiated from B2C (business-to-consumer) where the latter infers 'direct' online selling to end-consumers, who have no internal business systems.

Therefore a composite model of B2B - B2B<sup>S</sup>, B2B<sup>E</sup>, and B2B<sup>C</sup> that extends to Internet access for consumers (B2C), is proposed as the research framework in which benefits are realised.

### 3. METHODOLOGY

Prior to November 1999, eleven international SAP-based organisations with major e-ERP projects agreed to participate in the study. The findings of the preliminary investigation of established SAP sites are presented by the categories of the three interactive business models summarised as:

- Business-to-employee (B2B<sup>E</sup>) to harness the flow/sharing of corporate information, via intranets.
- Business-to-supplier (B2B<sup>S</sup>) to support supply chain management between partner organisations.
- Business-to-customer (B2B<sup>C</sup>) to allow Web access to corporate customers that extends to an online global consumer base.

The study is used to explore the how benefits are realised from the adoption of inter-organisation e-ERP business solutions using the following research framework in Table 1.

**Table 1: Research Questions Matrix**

Question	Data Collection Instrument	Data Analysis
How do organisations maximise benefits and minimise barriers from e-ERP implementation?	Semi-structured 1 <sup>st</sup> interview questionnaire; used Nov-Dec 1999	Match case content of each e-ERP project against B2B interaction.
<b>a</b> What is the nature of B2B models induced by e-ERP?	Project correspondence with SAP/IT project managers and consultants 1999-2001	Content analysis of qualitative data. Cross-case analysis of benefits to determine the B2B issues.
<b>b.</b> Does the increase in B2B interaction deliver increased benefits from e-ERP?	Public and private company documents; June 1999 - June 2000, 2 <sup>nd</sup> interviews July – August 2000	Rank the level of benefits against the increased level of B2B interaction

In each case, a senior IT project manager was contacted for the purpose of conducting interviews. Tables 2, 3, and 5 summarise the profiles of six of the eleven case organisations that participated in the study. The findings are analysed according to the level of sophistication of B2B interaction.

#### 4. FINDINGS OF ALL B2B MODELS

##### 4.1. B2B<sup>E</sup> Cases: Employee Self Service for improved access to corporate information

The cases profiled in Table 2 demonstrate the use of e-business intranet applications. This category of application links a company's ERP data to the Web to provide access for all employees to corporate data, eg SAP Employee Self Service (ESS). It represents the earliest stage of e-ERP implementations.

**Table 2: Business-to-Employee (B2B<sup>E</sup>) Cases**

B2B <sup>E</sup> Interaction	*Case Alias	Employees	e-Business Application	No. of Users
Intranet access to ERP	<b>1. Engineer.com</b>	Managers & engineers	Mgt reporting and tracking of skilled contractors	~1100 staff
	<b>2. Bank.com</b>	All employees	Networking of employees across very large bank	~45,000 bank employees

\* 2 Large companies with increasing level of employee access 24x7 to R/3 personnel data

Two large established organisations, from distinct industries, implemented organisational intranets that allowed Web access to SAP R/3 HR data. These solutions were easy to deploy while offering significant benefits for employee networking and the management of corporate information.

**Case 1.** *Bank.com* implemented the SAP Internet solution for internal address management. It covers all organisational information within the bank and is the most-used Web application, available for all 45,000 employees, with 300,000 transaction calls per day. It implemented its own Intranet integrated with R/3 to facilitate the networking of the staff in preparation for e-commerce. 'This is a generic office management solution, not a Banking industry solution, to save time and paper for the distribution of staff information'. It offers transparent access to important policy manuals and procedure documents across all departments and collective use of many functions (Perez et al., 1999).

**Case 2.** *Engineer.com* staff developed an in-house Web initiative that allowed access to R/3 personnel data. It is a specific example of a HR Intranet application to improve personnel management in Oil and Gas construction projects. The application has proven to be a major tool for supporting decision making towards minimising offshore labour costs of skilled agency workers in offshore projects. With the aid of computer graphics this Intranet system provided a simple "walk-up" user interface for casual users, including project managers who have little or no training on the use of the R/3 HR module. It has been expanded to include a computer hardware tracking system.

To maximise the benefits- there needs to be:

- A recognition that the inspiration of ESS applications can come from end-users.
- The communication of the corporate vision.
- A commitment to create the Intranet system as a 'learning system' at all levels of use.
- All managers and IT staff must learn together to seek and develop new business models.

To minimise the barriers – the design of the Web interface and its functionality:

- Must accommodate the least experienced employee.
- Must enable users to be more efficient than previous paper-based systems including faxes.
- Must provide groupware solutions to enhance communication.

In summary by allowing employees appropriate access to core systems:

- (i) The managers in the *Engineer.com* case were able to **minimize costs**.
- (ii) The employees in the *Bank.com* case were able to provide **efficient service**.
- (iii) In both cases the e-ERP applications offers collective use of many functions or “**shared services**” across certain groups with improved quality of work life.

Finally, to maximise the benefits from **employee self-service** applications, employee involvement is essential. To minimise the barriers, these applications need to deliver efficient and shared services.

#### 4.2. Cases B2B<sup>S</sup> : Online Procurement for Lower costs and B2B<sup>E</sup>

The cases profiled in Table 3 demonstrate the use of e-business ‘buy-side’ applications. This category of application links a company’s ERP purchasing processes to a supplier’s catalogues, eg SAP “B2B Procurement”. The B2B procurement software with links to R/3 is designed to reduce costs and shorten program runs, boosting company earnings and supporting the strategic objectives of supplier management. The Internet-enabled process flows provide a flexible, standardized control layer that regulates the forwarding of requisitions and purchase orders to the right person for approval. The motivation for these developments or business driver is cost reductions and efficiency gains.

**Table 3: Business-to-Supplier B2B<sup>S</sup>**

B2B Interaction (level)	*Case Alias	B2B Sub-class	e-Business example	No. of Users
ERP to supplier catalogues,	<b>3. Biotec.com,</b>	B2B <sup>S</sup>	B2B procurement of bio-chemicals items as core business	~240
+ Intranet access to ERP-HR	<b>4. O&amp;Gas.com</b>	B2B <sup>E</sup> , B2B <sup>S</sup>	B2B Procurement, and updated by Intranet access to Personnel data	~18,000
+ Intranet access to ERP-HR	<b>5. Employee.com</b>	B2B <sup>S</sup> + B2B <sup>E</sup>	B2B Procurement with Intranet access to Personnel data	~14,000

\* 3 Cases representing 3 industries, ordered by increasing level of B2B<sup>E</sup> with B2B<sup>S</sup>

**Case 3.** *Biotec* pioneered the SAP B2B Procurement e-business solution. It reported ‘lead times to fill an order were down from five to just one day, from the point in time when an employee identifies an order, to actual delivery’. Having achieved shorter lead times, *Biotec* no longer needs to keep large stocks of materials, so expenditures are down and cash flow is healthier. Indeed, the company estimates it will to save between 10 and 15 percent on the cost of purchasing suppliers.

Another goal of the B2B<sup>S</sup> project was to build more long-term links with preferred vendors (suppliers). So far, *Biotec* has identified three such vendors. The procurement department already attributes one major success to its new procurement process: It has been able to increase the discounts previously offered by its three preferred vendors by a further five percent (15% overall). The vendor Internet sites were linked into the SAP procurement system, allowing *Biotech’s* research staff, with no training, to use e-procurement on the company’s own intranet and to purchase from both the internal catalogue and external online catalogues. This was made possible by a specially developed open catalogue interface and common items numbers.

**Case 4.** *O&Gas.com* the world’s largest supplier of crude oil, implemented the “SAP B2B Procurement” software for processing internal and external procurement of supplies, across the entire enterprise. The company processes more than 350,000 invoices annually, and awards over 40,000 contracts. “By using SAP B2B Procurement to leverage the existing SAP R/3 Oil and Gas industry solution, the company sought to take full advantage of business processing via the Internet.” The company estimates a considerable improvement in the ratio of invoices to orders as well as a tangible contribution to revenue earnings (SAP, 1999a).



Prior to the introduction of the B2B<sup>S</sup> project the company foresaw the potential of the Internet for its competitiveness in the Oil and Gas industry. It established the BRA programme (Norwegian for good) for a “better and faster” global administration. This programme was used to raise the level of Internet skills throughout the company. Employees were encourage to work from home with their administrative work. Venkatraman et al., (1999) reports this resulted in a variety of unexpected benefits. Later, implementing the SAP software allowed approximately 18,000 employees direct access to Internet catalogues. They can select supply items as they require, freeing resources in the purchasing department for strategic tasks. This B2B<sup>S</sup> project was viewed as an enhancement of B2B<sup>E</sup>. Further, benefits were realised by **employees** performing their own airline reservations and travel arrangements.

**Case 5.** *Employee.com* a major recruitment and employee services company, implemented SAP’s Internet suite of **employee self-service** applications. This was used to network more than 1,400 employees in more than 200 offices, countrywide. It included an employee **procurement** solution, to realise cost savings in the purchasing and human resources. It helped reduce administration tasks and paper forms; for example, filling in forms for leave applications, distribution of personnel information. Staff reported the Web-based leave applications were user friendly for non-trained users.

The nature of the business was getting the long term unemployed (candidates) back into jobs. This often necessitated purchasing basic items for candidates to help them over small barriers to work, eg shoes, and glasses. The procurement system was designed mainly for small irregular items where it processed the accounts and the expenditure automatically for candidates. It tracked the activities of the consultants, and provided a chain of order numbers for vendors and debtors.

However, many users tended to revert back to the old paper-based system as they experienced difficulties in following and using Web-based SAP R/3 online purchasing. The purchase of small irregular purchases was scrapped and only regular purchases such as office materials (MRO) were supported online. This appears to inspired by an IT driven project mindset.

*To maximise the benefits:*

- Roll-out of the e-business solutions needs to be achieved very quickly for ROI. Also, there needs to be ‘full cooperation between industry partners’.
- Increase the availability of supplier catalogues and encourage collaboration between suppliers, by standardising catalogue item numbers. Efficiency was derived from approval process.
- Strive for better level of vendor (supplier) communication, ‘it is only with content that you gain a win-win, eg industry catalogues’. This emphasises the importance of the B2B value chain.
- Finally, to make use of SAP’s industry portal requires the organisation to embrace change.

*To minimise the barriers:*

- Design and build a Web interface that users comprehend and will use. ‘Although the SAP was obviously good as a back-end business system, the interface lacked sense user friendliness.’
- Corporate paranoia is in the minds of managers and consultants. ‘We need to understand the environmental factors and more practical issues, not only the IT infrastructure.’
- Change management is needed to address employee and partner resistance to change.
- Aim to pitch the interface to the lowest common level of end-user and then provide training to bring up to the necessary level of competence.
- Communicate the benefits for the user of the business processes. To be more productive users need to appreciate the changes to the key business processes.

In summary by allowing employees appropriate access to purchasing systems:

- (i) The B2B<sup>S</sup> projects enabled all organisations to **reduce costs** in purchasing and lower inventory through standardised catalogues, standardised vendor interfaces, open catalogue interface will enable sharing of profits between companies and their preferred vendors.
- (ii) Procurement solution enabled *O&Gas* to benefit from **revenue generation**.
- (iii) The B2B<sup>S</sup> projects enabled all organisations to benefit from **efficient service**
- (iv) and more so from **process improvement** and further with communication with suppliers.
- (v) In all cases, the e-Procurement applications offered collective use of many functions or “**shared services**” across operational and administrative groups.

Finally, the cases represent a new approach towards cost reductions for both partners. But the benefits are by no means all one-sided. SAP B2B Procurement gives partners plenty of opportunities, such as direct ordering. In maximising the benefits and minimising the barriers, the focus is not only on **improved efficiencies** and other improvements that rely **employee self-service** and competencies.

All three organisations reported their e-ERP technology will play an integral part in helping established enterprises build and operate online business-to-business models. In particular, the B2B<sup>S</sup> e-procurement developments should lead to industry specific or private e-marketplaces. The companies believe future benefits will come from industry portals, eg Chems, O&Gas marketplaces.

#### 4.3. B2B<sup>C</sup> Cases: Developments from a Single B2B<sup>C</sup>

The cases profiled in Table 4 demonstrate the use of an e-business ‘sell-side’ application. This category of e-business applications links a company’s ERP catalogues and ordering processes to an intelligent Web site, eg SAP’s Online Store. It represents a primary stage of B2B<sup>C</sup> implementations. The motivation for these development or business driver is benefits from the optimisation of order processes, cost reductions and customisation of products and services.

**Table 4: Business-to-Customer B2B<sup>C</sup>**

B2B Interaction (level)	***Case Alias	B2B Sub-class	e-Business example	No. of Users
ERP to corporate customers	<b>6a. Comptec.com (cross-divisional)</b>	B2B <sup>C</sup>	e-Store across a global network of divisions, within a conglomerate	~11000
Multiple ERP to customer businesses	<b>6b. Comptec.com within a 1<sup>st</sup> stage business network</b>	B2B <sup>C</sup>	e-Mall of 3 e-Store divisions across a global network	~11000
Integration of B2B <sup>C</sup> and B2B <sup>S</sup>	<b>6c. Comptec.com (linked to) SAP.com</b>	B2B <sup>C</sup> with B2B <sup>S</sup>	Private e-marketplace- order request system integrated with SAP procurement system	~40,000

\*3 Cases of Stages of increasing level of B2B<sup>C</sup> interaction, within one industry

**Case 6.** *Comptec.com* implemented its own SAP solution for a sell-side system: The SAP-based Order and Request System (ORS) was developed by the parent company’s Business Services group and has been deployed in eight European countries. The system was developed to optimise processes between *Comptec* corporate customers and all other divisions of its global parent company.

*Comptec*’s business revolves around independent partners known as *valued-added* resellers and *key accounts*. In the past, system orders from partners were taken over the phone or in writing and then entered manually into the R/3 system. To make ordering faster and more secure, partners now submit their orders to *Comptec* electronically via the Internet. During the main periods of access (from 11 am to 4 pm), an average of a R/3 sales order every 6.5 items is received every 30 seconds and an average



of 600 order tracking requests. In parallel to its release at *Comptec* in Germany, the ORS was rolled out on an international scale. Already it has been deployed in England, France, and Italy, and in early 2000 Austria, Belgium, Spain and Switzerland followed (Siemens, 1999).

#### 4.4. Case 6a: B2B<sup>C</sup> Interaction for improved sales efficiency, reliability, and customer care

For *Comptec.com*, the effect of integrating R/3 with the Internet radically improved sales efficiency. By November 1999, some 80% of orders from 2200 key accounts throughout Germany were handled by ORS. Also, there was reasonable acceptance by the end-users, with less order errors aided by the reliability of SAP R/3 data. In addition to standard features such as the ability to browse a catalogue, collect items in a shopping cart, and place an order, ORS provides the following capabilities:

- Premium pages with the user's specific list of commonly purchased items.
- Order Tracking, for the capability to follow the progress of an order.
- Document Tracking; an extension to Order Tracking, which allows the electronic SAP R/3 documents to be viewed within a highly secure environment.
- Help Facility, with information on setup, FAQs and a Help Wizard.
- Download page, with additional tools and documentation.
- News Channel, for announcements and a News Forum, for customer debate.

To maximise benefits these organisations needs to:

- Be pro-active in making the web site a dynamically 'enticing-to-buy' experience for the public.
- Promote each corporate sponsor's particular charitable/social image with intelligent web links.
- Provide the online capability to educate the public about product lines specials.
- Improve publicity online catalogues and emails with attachments as customised catalogue.

To minimise barriers these organisations need to:

- Tackle the unresolved basic business issues of inefficient and ineffective processes within the R/3. Improve the tracking of orders and out-of-stock procedures.
- Resolve the legal issues in 'credit taken from end-users' before orders are processed.
- Ensure effective communication links between branches.

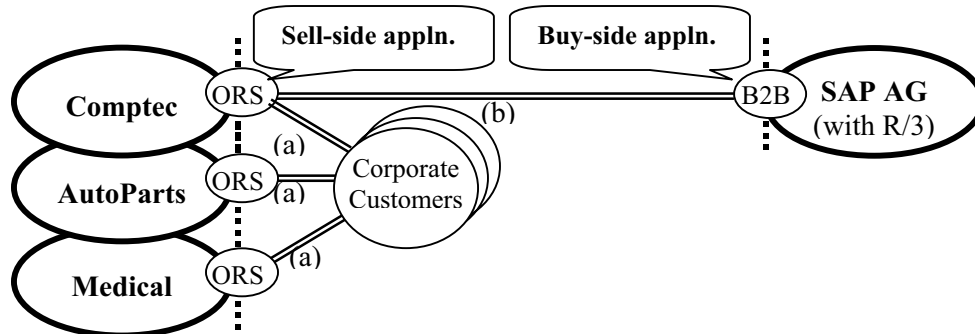
In summary by allowing customers appropriate access to core systems:

- (i) The B2B<sup>C</sup> solution enabled *Comptec*, to **reduce costs** in its business administration,
- (ii) and benefit from new **revenue generation**.
- (iii) *Comptec* was able to deliver **efficient service** for its customers.
- (iv) The B2B<sup>C</sup> applications offer collective use of many functions or **shared services** such as document tracking and order tracking across organisational groups.

Finally, the case represents a first stage towards revenue generation. To maximise the benefits, *Comptec* sought to deliver cheaper products with efficient service by utilising **customer self-service**.

#### 4.5. Case 6b: e-Mall as B2B<sup>C</sup> Interaction of a Sales Group to service Corporate Customers

An e-Mall is demonstrated by the second B2B<sup>C</sup> implementation profiled in Table 4. An e-Mall is an Internet marketplace for a group of companies to sell their products and services to their corporate customers.



Figures 2(a): e-Mall as a B2B<sup>C</sup> Group of e-Stores for Customers, and

2(b): Integration of B2B<sup>C</sup> with B2B<sup>S</sup> for a Seller with a Customer

Figure 2a illustrates the system architecture with the capability to connect and interact with a range of Buyer company's SAP R/3 and R/2 systems, and other ERP systems. By June 2000, the company's e-Mall had progressed to version 2 with three companies; *Comptec*, *AutoParts*, *Medical*. The benefits include those detailed in the previous B2C cases. In addition, the benefits of e-Mall flow from the streamlining of 'sell-side' business processes:

Partner group specific product presentation;

- Integration of Group's products, materials, systems through intelligent links;
- "One face" to the customer for the holding company;
- Sales group presence 24x7 and world-wide with complementary offerings.
- Reduction of incorrect orders and changes to orders
- Most up-to-date offerings with high visualisation and interaction.
- Customer feedback through an open e-community.

The lessons learnt about maximising the benefits and minimising the barriers, include; the quality of the Web interface from the end-users view, and the agreement of partners on a common IT platform with appropriate marketing. The cases demonstrate a shift from simply utilising **customer self-service** through buying incentives, to empowering **customers** to be effective in placing orders.

#### 4.6. Case 6c: B2B e-Business Integration of two Organisations for Complementary Benefits

The third implementation profiled in Table 4 demonstrates the integration of two e-business implementation models, B2B<sup>C</sup> and B2B<sup>S</sup>. Figure 2b above, illustrates the use of two complementary applications for doing e-business via the Internet; a 'sell-side' application for the suppliers with a 'buy-side' application for the corporate customer. *Comptec.com* and *SAP.com* began conducting e-business in December 1999, in a point-to-point Internet buying and selling solution. The system was developed to optimise processes between *Comptec's* 'Order and Request System' and SAP's 'SAP B2B Procurement' across the Internet.

In this implementation model of complementary systems, the shared benefits are summarised in Table 5. Shares savings are realised through the optimisation of a variety of functions; sales, orders, purchases, and payments within a negotiated agreement between the partners. The intuitive and easy-to-use Internet interface enables users with a minimum of training to create purchase requisitions for indirect materials.

**Table 5: B2B e-Business Integration for Complementary Benefits**

Comptec Benefits	Partner Benefits
<ul style="list-style-type: none"> <li>• Ordering times optimised through online connection</li> <li>• Shorter and therefore faster ordering times</li> <li>• Incorrect orders reduced to minimum</li> <li>• Presentation of configurable products on the Internet</li> <li>• Information management for CRM</li> </ul>	<ul style="list-style-type: none"> <li>• Available 24 hours a day, 7 days/wk.</li> <li>• Simpler ordering, resulting in savings in cost and time</li> <li>• Automatic online information on order changes and delivery notifications</li> <li>• Tracking of orders at any time</li> <li>• Pre-testing of products</li> <li>• Customised service</li> </ul>

In addition to the standard benefits from B2B<sup>C</sup> and B2B<sup>S</sup> models, Table 6 identifies **customised service** as a extra benefit. Within a negotiated arrangement and with real time access to customer's purchasing data employees of *Comptec* are now able to use information management tools to deliver customised services. Similarly the employees of *SAP.com* benefit from customised documentation on additional tools and software testing tools. This case demonstrates a shift from utilising **employee and customer self-service** to empowering employees in customised service using information management techniques. The next stage of evolution of this case is to be a private e-marketplace.

## 5. SUMMARY OF FINDINGS

The findings are analysed according to the stages of sophistication of the e-business interaction models. Collectively they demonstrate that greater benefits flow from increased level of e-business interaction as shown partly in Table 6. This table is used to identify those cases that were observed to have realised some benefit. Within the B2B<sup>S</sup> model, employees of *Biotec* (3) and *O&Gas* (4) reported an improvement in the quality of work life, where as employees of *Employee.com* (5) were frustrated by their new systems.

**Table 6: B2B e-Business Integration Benefits Scorecard**

Benefits	Model	B2B <sup>E</sup>	B2B <sup>S</sup>	B2B <sup>C</sup>	B2B <sup>C</sup> with B2B <sup>S</sup> Integration
Reduce Costs		1	3, 4, 5	6a, 6b	6c
Efficient Service		2	3, 4, 5	6a, 6b	6c
Shared Services		1, 2	3, 4, 5	6a, 6b	6c
Revenue Generation		na	4	6a, 6b	6c
Quality of work life		1, 2	3, 4		6c
Process Improvement			3, 4, 5		6c
Customised service					6c

To realise the benefits, the lessons learnt about maximising the benefits and minimising the barriers are recommended. These include; the quality of the Web interface from the end-user's perspective, the agreement of partners on a common IT platform, and communication of the business strategy.

Figure 3 is developed as a comprehensive model to draw together the key elements of the findings, and their relationships B2B e-business interaction. This model illustrates how change in business practices and e-ERP developments relate to the B2B sub-models; B2B<sup>E</sup>, B2B<sup>C</sup>, and B2B<sup>S</sup>. It identifies that there is an accelerated symbiotic relationship between e-ERP technologies and business improvement caused by a shift in customer demand. The triangle in Figure 3 represents the three facets of B2B models. The connecting arrows between suppliers, employees, and customers indicate the need for complementary benefits between stakeholders, where the dotted arrows indicate a reliance on self-service.

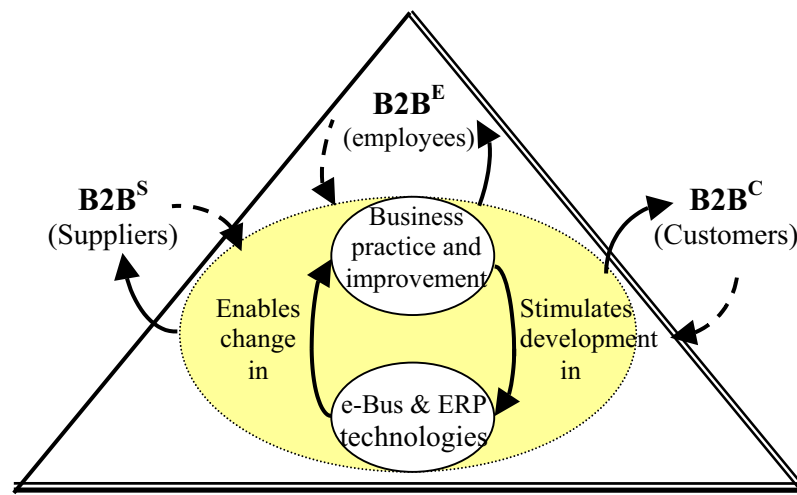


Figure 3: Symbiosis of e-ERP and Business Practice for B2B interaction

To realise the benefits from e-ERP implementations, organisations are optimising three B2B models;

- to offer cheaper products with efficient service by utilising **customer self-service** in B2B<sup>C</sup>,
- to procure materials cheaper and efficiently through **e-procurement** agreements in B2B<sup>S</sup>,
- and to optimise both B2B<sup>S</sup> and B2B<sup>C</sup> for customised service by utilising **employee self-service**, in B2B<sup>E</sup>.

## 6. CONCLUSIONS

The early adopters of e-business applications show a trend towards realising benefits from B2B procurement and employee self-service applications. To maximise the benefits from these types of applications, employee involvement is essential. Combined, these applications offer use of many functions or “shared services” across operational and administrative groups. All this relies heavily on employee self-service and leads towards new work roles.

Recently, organisations have begun to undertake revenue generation from e-Stores and e-Malls. A complex case with B2B e-business integration of a global computer supplier and a large corporate customer demonstrates the integration of e-business applications across ERP systems. With Web-based technologies this provides an architecture to optimise the overall B2B value chain. The case is used to emphasize the synergistic benefit stream from B2B e-business integration of the B2B interaction models. The findings of all cases are analysed according to the stages of sophistication of the e-business models. Collectively they demonstrate that greater benefits flow from increased level of e-business interaction.

Some organisations have begun to undertake e-business initiatives to meet strategic goals. They recognise they will only accomplish their objectives through people. Therefore placing importance on improving the quality of work-life issues. If effectively managed, employees should ultimately be

more productive in their work tasks and better able to serve customers, suppliers, and business partners. A candidate model for future research on e-business implementations with ERP is proposed as a B2B interaction model (Figure3). In this model, the realisation of complementary benefits for all business partners is viewed as a necessary and sufficient for measure of success.

As business thinking shifts from cost saving to revenue generation, this model is recommended as a research tool, for future study of the broad and new complex phenomenon of e-ERP implementations. Therefore the next step is to extend this study towards investigating e-marketplaces with ERP.

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