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# TO BE OR NOT TO BE — AN ERP QUANDARY

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**Abstract**

*This paper examines a research model that proposes various antecedents to successful e-business change management in ERP environments. A case study of the first B2B e-business integration with Dell Computer Corporation and its largest corporate customer is examined in the context of this model. The study demonstrates the integration of ERP and non-ERP systems, using Web-based technologies, to optimise an overall B2B value chain. From this we identify facilitators that lead to the success of an e-business project and emphasise the role of change management and cultural readiness when adopting e-business solutions.*

**Keywords:** Internet enabled ERP, B2B e-procurement, e-business change, organisation performance

## Introduction

According to interviews conducted by Forrester Research with 40 senior IT and e-Commerce executives, Electronic business will explode by 2002 because they expect 78% of their customers and 65% of their trading partners to have global electronic connections with them, up from 40% and 43% respectively. Online revenue growth has quadrupled each year. In 1998, it totalled $35 billion inter-company and $15 billion retail, worldwide. In 2000, out of 256 million users, 53 million buyers will average $4,090 each in e-commerce business (combined inter-company and retail). By 2003, online revenues will exceed $1.3 trillion (Hesterbrink 1999:p3).

As more and more established organisations realise that they need to open themselves to their customers, partners and suppliers over the Internet, integration with ERP systems becomes a critical issue. However, little information is available on how to successfully integrate e-Business projects with ongoing ERP implementations or already productive ERP systems. This combination of technologies offers **established** companies the opportunity to build interactive relationships with its partners and suppliers, improve efficiency and extend its reach, all at a very low cost. Although these technologies are fundamentally different, the fusion of their functionality offers a sound infrastructure for doing business online or electronic business. Here e-business means "making the key business processes of an organisation available over the Internet" (Boey et al. 1999: p.1). Although simple, this definition nevertheless incorporates some subtle but key points about e-business applications with ERP systems.

The paper reports on a qualitative case study of two partner organisations, that are using the Internet to integrated their non-ERP and ERP (SAP R/3) systems for electronic procurement. The case presents a recently implemented B2B e-business project by *Dell* to be used to supply computer equipment to one of its customer companies, *Customer.com*.

## Theoretical Framework

The current study makes use of an established theoretical framework taking from business process change (BPC) research. Figure 1 shows the adapted framework that was used as a tool for identifying the facilitators and inhibitors of successful e-business projects within ERP enabled organisations. "Embedded" multiple case-study analysis was chosen to investigate the research questions concerning the broad and new complex phenomenon of e-ERP change management. "Embedded" multiple case-study analysis was chosen to investigate the research questions concerning the broad and new complex phenomenon of e-business change projects. Embedded enlists the use of multiple units of analysis; (1) the company (strategy), (2) the project team, (3) the project.

## Case Selection

To identify the sites, a search using secondary literature, web sites, and SAP related industry consultants were contacted to identify major e-ERP projects. Within the scope of this study the term e-ERP project is used to represent any instance of Internet-ERP technology adoption (eg SAP B2B Procurement, SAP Employee Self Service, SAP Retail Store), (SAP 1999). More than ten SAP enabled organisations known to have adopted e-business systems were selected. In each case a senior IT/SAP project manager was contacted for the purpose of conducting an interview.

The e-business initiatives selection criteria used is detailed in Table 1.

### *Data Collection*

During November 1999 initial interviews were conducted in person by visiting each organisation at their headquarters. Senior e-business project managers were questioned about "the benefits and barriers arising from extending their R/3 business processes onto the Internet." A repeat visit to each site in June/July 2000, was performed to collect the primary information for this study, using the following protocol:

- A qualitative structured interview questionnaire was used during the second visits to collect primary data for the study from eight SAP worldwide sites.
- Multiple archival documents, as well as many conversations via e-mail were collected.

In each case the focal point of contact was the senior level IT/SAP project manager.

In Table 1, one of the e-business project stands out from all the other seven mini-case studies for its inter-organisational focus.

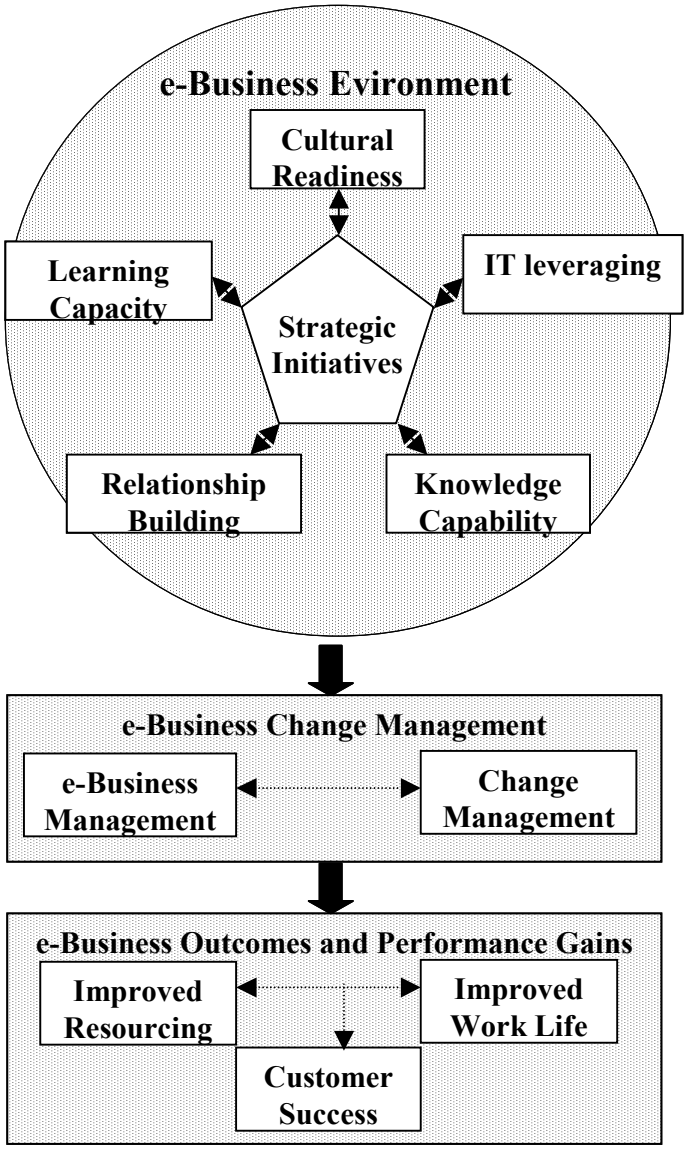


**Figure 1. A Theoretical Framework of e-Business Change**
(Adapted from Guha et al. 1997)

### *A Case Study of B2B Integration*

In 2000 Dell pioneered (implemented) its first business-to-business "B2B E-Business Integration" with an established customer company. The information gathered on this case forms the basis of the discussion for rest of this paper. This case is chosen here because it illustrates a comprehensive approach to inter-enterprise computing. This is example of an integration architecture is made possible through a variety of backend systems and procurement systems.

How does it work? One of Dell's customers, *Customer.com*, is leveraging its existing SAP backend system and SAP business Connector (powered webMethods technology) to communicate directly with Dell's e-business system. The integration between *Customer.com's* SAP ERP and SAP B2B procurement application to its customer Dell catalogue automates the procurement of Dell products via the Internet (Dell, 2000).

**Table 1. All Case Organisations Interviewed**

| Criterion of Project | Bank | Biotech | Charity | Dell & Cust | Employ-ment | Engin-eering | Scitech | Society |
|---|---|---|---|---|---|---|---|---|
| *1. Major e-business project* | B2E | B2B | B2C | B2B | B2E/B | B2E | B2C | B2C |
| *2. Project completed* | Locally | Yes | Sep '00 | Yes | Yes | Locally | Yes | Yes |
| *3. Expected breakthrough* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *4. Cross functional focus/ Inter-organisation focus* | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| *5. Unambiguous outcomes* | Yes | Yes | Yes | Yes | No | Yes | Yes | No |
| **Size of Organisation** | **Large** | **Medium** | **Small** | **Large** | **Large** | **Large** | **Large** | **Small** |

### Technology Fit

In adopting an enterprise information system, technology is only half the picture. Organisational perspective is equally important (Fan, 2000). Figure 2 illustrates the issue of business or enterprise information systems fit versus organisational performance. *Customer.com* implemented SAP as its enterprise business system. However, unlike *Customer.com,* Dell sees itself "as competing in a very dynamic environment with ever *changing* technology, customer tastes, and supplier relationships" (Fan, 2000: 29). For this reason, Dell choose to abandon its early development in SAP and in 1996 started to use COM as a standard in developing its component-based enterprise solution. Further, Dell strongly believes that the company has to adopt a more flexible approach, in order to fit IT to its overall corporate and operation strategy.

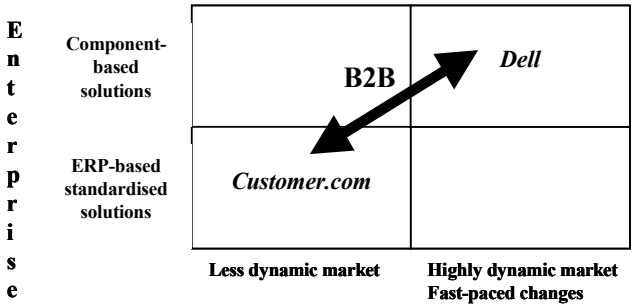


**Figure 2. Decision Matrix for Dell and Customer Partner**
(Source: Fan 2000)

## Research Findings

At the case interview of the project manager information was collected using a structured questionnaire that probed three levels of detail; from components, and their constructs with their corresponding categories. Tables 2a, 2b, and 2c represent the detailed data collected using interview sheet, that was adapted from that developed by Guha et al. (1997).

By analysing the data and comments captured from the interviews, a qualitative rating was first derived. The comments to help focus on the contributions of the individual components of the research or business framework. Each component of the framework was rated as having a positive (+ve) or negative (-ve) contribution to the e-business project.

The results given in Tables 2 show an overall level of success was achieved. The column of ratings draws attention to the importance of having positive contribution from all the components (synergy) for the project to be successful (Guha et al,1997). To understand these summarised findings, a more in depth discussion follows for each of the three main dimensions of e-business change - the **change environment**, the **management of change**, and the **outcomes and performance gains**.

## Change Environment

### *Strategic Initiatives*

This IT innovation sprang from the insights of one of the company's IT/professional staff. This is due mainly to the IT manager acting as an "ideas champion". The champion had the drive and energy to make the project happen. Also, the "ideas champion" received decision making support from the central administration (board). He had the motivation to communicate and sell the vision for the project to others in the organisation so that they were willing to provide their support.

**Table 2a. Findings in the *Change Environment* of the Business Framework**

| Component<br>*Constructs* | Supplier Organisation<br>"Dell" | Customer Organisation<br>"Customer.com" |
|---|---|---|
| **Strategic Initiatives** | | |
| *stimuli* | pro-active | pro-active |
| *formulation scope* | **incremental** | **revolutionary** |
| *decision making* | champion emergence | champion emergence |
| *strategy led* | onset | onset |
| **Cultural Readiness** | [+ve] | [+ve] |
| *change agents* | + | + |
| *leadership* | + | + |
| *risk aversion* | welcomed | welcomed |
| *extent open communication* | + | + |
| **IT Leveragability** | | |
| *role of IT* | enabling | enabling and **socio-technical** |
| *use of Internet technology* | **superior** | **adequate** |
| **Network Relationships** | [+ve] | [+ve] |
| **Balancing** | | |
| *inter-organisational linkages* | cooperative | cooperative |
| *cross-functional cooperation* | adequate | adequate |
| **Learning Capacity** | | |
| *improve efficiency* | learning by doing | learning by doing |
| *adaptation* | **learning from others** | **response to IT change** |
| *learning type* | **double-loop** | **single loop** |
| *external information use* | **boundary spanners** | **technology gate-keeper** |
| *declarative knowledge* | focus on core competencies | focus on core competencies |

**Key:** +ve = facilitator, -ve = inhibitor; + & - = facilitator & inhibitor

**Table 2b. Findings in *e-Business Change Management* of the Business Framework**

| Component<br>*Constructs* | Supplier Organisation<br>"Dell" | Customer Organisation<br>"Customer.com" |
|---|---|---|
| **e-Business Mgt Practice** | | |
| *e-business measurement* | **use of e-bus metrics** | **audit** |
| *use of tools and techniques* | **superior** | **adequate** |
| *use of team-based structure* | + | + |
| **Change Mgt Practice** | [+ve] | [+ve] |
| *mgt's readiness to change* | **committed** | **participative** |
| *nature of change* | + | + |
| *scope of change* | **improvement** | **radical change** |
| *managed change* | **alleviation of dissatisfaction** | **revolutionary change tactics** |

**Key:** +ve = facilitator, -ve = inhibitor; + & - = facilitator & inhibitor

**Cultural Readiness** In the project, the staff showed a desire to be part of change – "to project a new business image". The change agent was the practical leadership of the management staff. "We are very proud of this ERP integrated e-business solution." This was the view of both partners.

For *Customer.com* the leadership showed inspiration for the development of a practical solutions that overcame management obstacles. However, there remains the problem of training employees. A culture of acceptance to change introduced for the benefit of the all staff, and not just the clerical employees.

### *Network Relationships and Learning Capacity*

For *Customer.com* the project demonstrated positive cooperation with the interstate sub-branch of the organisation, and the development of inter-organisational cooperation.

In the project, learning by doing and learning from others helped improve the professional end-user IT skills. The extra time saved enabled the staff, on both sides of the partnership, to devote time to quality decision making procedures.

### *IT Leveragability and Knowledge Capability*

For *Customer.com*, the project demonstrated positive leadership, superior IT design for improved learning, and business-to-employee communication, but with some employee resistance. To overcome resistance to change, each of these components, must be aligned (along with the enabling technology) to the strategic initiatives to overcome resistance to change (Chesterbrink, 1999).

## e-Business Change Management

### *e-Business Management*

The use of computer graphics in combination with the web tools and techniques also had positive influence on the use by casual users.

The pattern of change was reported to be a participative change tactic resulting in an evolutionary change. This was viewed as a "waterfall" progression of change, starting with an alleviation of dissatisfaction by the staff and eventually arriving at a "well managed" workflow:

alleviation of dissatisfaction,

↳ vision for change – "doing business in a new and improved way",

↳ evolutionary change tactics,

↳ a well-managed process for change – "however, time frames were too restricted" to be considered "well managed".

### *Outcomes and Performance Gains*

The outcomes of e-business change (e-BC) can be measured at various levels within the broad complex phenomenon of an e-ERP project. In any examination of e-BC outcomes, consideration should be given to; (i) the environmental conditions for change, and (ii) the ability of the organisation to manage change in those conditions (see Tables 2a and 2b).

To address these areas and issues effectively Kaplan and Norton (1992; 1996) offer the use of a balanced scorecard (BSC). The use of BSC for strategic enterprise management is a significant departure from traditional performance management programs that are tied to traditional financial frameworks. The BSC provides that discipline that helps executive teams to articulate and better understand their strategies. In addition, the BSC enables organisations to introduce a new governance and review process that is focused on strategy and not on tactics. The governance process emphasises learning, team problems solving and coaching. More recently, leading firms that have begun to undertake e-BC to meet strategic goals recognise that they only accomplish their objectives through people. If effectively managed, employees should ultimately be more productive in their work tasks and better able to serve customers, suppliers, and business partners. The key constructs that can be probed here are; gaps between effectiveness expectations (goals) and actual performance improvements, eg efficient company resourcing, quality of employee work life, customer satisfaction - from Venkatraman and Henderson's view of "virtual organising", (1998).

**Table 2c. Findings in *Outcomes and Performance Gains* of the Business Framework**

| Component / Constructs | Supplier Organisation "Dell" | Customer Organisation "Customer.com" |
|---|---|---|
| *quality of work life* | employee satisfaction | employee satisfaction |
| *B2B resourcing* | cost savings( + ), choice(NA), quality ( + ), reliable ( + ) | cost savings( **25%** ), choice( + ), quality ( + ), reliable ( + ) |
| *B2C networking* | 1st B2B customer | 1st B2B supplier |

### *Outcomes*

It was reported that from the outset the project showed an improvement in one of the outcome constructs - the quality of work life (QWL). However, within the area of **performance gains,** improved customer response and an expanding customer base was seen as most significant (positive). As a measure of its success and/or acceptance, this e-business solution is expected to include the B2B e-procurement of office equipment and supplies.

### *Performance Gains*

The performance gains for e-procurement were achieved from two sources; 25% cost savings, and reduced cycle time from 2 weeks to 2 days, and access to (real-time) customer data via ERP technology. The project enabled efficiency gains from minimising of delays in customer orders, and effectiveness gains from optimising employee/staff time. For example; fewer complaints, improved management of the customer, increase to 50% with online orders (sales), and a growth in corporate sale of 45% (DELL, 2000). Also, access to online real-time data for deciding on the optimal employee orders. The cost savings through operational efficiencies of all equipment resourcing, compare favourably to those cost savings (efficiencies) in other e-procurement case studies. In the *Biotech.com* case study (UK) the gains appear to be less; 20% cost savings, and reduced cycle time from 2 weeks to 4 days. However, improvements for staff in the QWL dimension appear the same.

## Future Studies

In the future e-business with ERP technologies will play an integral part in helping established enterprises build and operate B2B e-procurement solutions, and eventually lead to the development of electronic marketplaces. Also as e-business adoption becomes common place, corporate portals for empowering employees will be considered as an economic necessity. When these corporate front-end systems begin to look and feel the same, the real competitive advantage will ultimately come from the ERP back-end systems.

The next wave of economic advantage lies in revenue generation from business opportunities in new e-business models. As business strategy shifts from just cost savings to revenue generation, this research framework is recommended as tool for future study of the broad and new complex phenomenon of e-ERP implementations. A candidate area for future research is *e-business change and organisational performance, in ERP environments* .

In general, future research will need to focus on the theoretical conjecture: an e-business project built on the strong foundation of an ERP (or equivalent component-based system), that can provide information for all business partners, and process incoming information from customers and suppliers, is much more likely to succeed than one lacking this foundation.

## Conclusions

The case study showed how *Customer.com* is currently using B2B integration with *Dell* and its SAP system to provide immediate process efficiencies, and should provide a model for use with all other suppliers. This e-business solution is made possible by an integrated architecture of a variety of backend systems and procurement applications or systems. The primary beneficiaries were the corporate customers, through the automation of B2B e-procurement and customer details management.

The adapted research framework for e-business change was used to identify the factors for success of this e-business project within an ERP environment. The results confirm the previous findings from studies in the area of “business process change”. Here the e-business project was found to have facilitators in all components of the business framework, including the change environment and project management. Further there is the implication that; the least successful e-business projects will have inhibitors in both dimensions, especially in the area of cultural readiness and change management. In this case study, customer satisfaction and increased sales was derived from an overall acceptance to change in administrative processes and IT use. This highlights the need to encourage the balancing of conflicting organisational and people needs, when contemplating the implementation of e-business solutions.

## References

Boey, P. Grasso, M. Sabatino, G. Sayeed, I. "Architecting eBusiness Solutions", (II:7), 1999, pp. 1-3 http://www.cutter.com/consortium/freestuff/dcar9907.html]

Dell, M. Fredman, C. Direct from Dell: Strategies that Revolutionised an Industry, HarperBusiness, NY, 1999, Ch. 13

Fan, M. Stallaert, J. Whinston, A.B. "The adoption and design methodologies of component-based enterprise systems," European Journal of Information Systems, (9); 2000, pp. 25-35

Guha, S. Grover, V. Kettinger, W.J. Eng, J.T.C. "Business Process Change and Organisational Performance: Exploring an Antecedent Model," Journal of Management Information Systems, (14:1), 1997, pp. 119-154.

Hesterbrink, C. "e-Business and ERP: Bringing two Paradigms together," Price Waterhouse Coopers, Sept 1999. [http://www.pwc.com]

Norris, G. Hurley, J.M. Hartley, K.M. Dunleavy, J.R. Balls, J.D. E-Business and ERP: Transforming the Enterprise, PricewaterhouseCoopers, John Wiley & sons, USA, 2000

Pereira, R.E. "Resource View Theory Analysis of SAP as a Source of Competitive Advantage for Firms", *The Database for Advances in Information Systems,* (30:1), Winter 1999, pp. 38-46

SAP "e-Business Solutions: (1999-2000) mySAP.com", 1999 [http://www.sap.com/solutions/e-commerce/executiv.htm]

Venkatraman, N. Henderson, J.C. "Real strategies for Virtual Organising," Sloan Management Review, Fall 1998; pp. 33-48