An Extended Model of e-Business Change Management

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ABSTRACT

This paper presents the results of a study into the antecedents for e-business change management success. A confirmed model of e-business change was used to structure interviews in eight international organisations and develop detailed case study analyses. These studies confirmed the validity of the e-business change model but further identified those factors which were critical to success. This provided the basis to extend the model showing specific dependencies within the model and a checklist for successful B2B implementation.

INTRODUCTION

Kalakota et al. (1999, p.60) state that "the creation and implementation of an e-business project is inextricably linked to the management of change." This requires systematic attention to learning processes, organisational culture, technology infrastructure, people and systems thinking. e-Business change (eBC) is defined here as an organisational initiative to design an e-business project "to achieve significant breakthrough improvements in performance" (Guha et al., 1997, p.121). For example; "cost, quality, responsiveness, flexibility, satisfaction, shareholder value, and other critical" e-business measures. These performance gains can be achieved through changes in relationships between management, information, technology, organisational structure, and people. Planning and managing such systems requires an integrated multi-dimensional approach across the e-business and the development of new business process models (Kumar & Crook, 1999; Scheer & Habermann, 2000).

In trying to bring about e-business change "managers would do well to recognise the complementary nature of technology, business models, and e-business readiness throughout the value chain from their suppliers to their customers." (Barua et al., 2001,   p.39)

RESEARCH APPROACH

The study used an established theoretical framework (Figure 1) from business process change research (Guha et al., 1997), for identifying and examining the facilitators and inhibitors of successful e-business projects. The research question addressed was,

"What components of eBC model facilitate and/or inhibit success of e-Business projects? This question was further considered as:

(i)   What are the critical success factors of e-Business projects?
(ii)   Is the eBC model appropriate for identifying patterns of change?"

Embedded multiple case study analysis was chosen to investigate the research questions concerning the complex phenomenon of e-business change projects, in eight organisations (Yin, 1989). Embedded approaches enlist the use of multiple units of analysis: (i) the company (strategy), (ii) the project team, and (iii) the project. This triangulation attempts to validate primary data (Eisenhardt, 1989). The case study selection criterion required a major e-business project, which had organisational implications. Also, as the focus was on studying antecedents to organisational performance, a set of projects having a range of B2B initiatives with variance across cases, but with the same outcome measures was required: cost reductions, responsiveness, flexibility, satisfaction, shareholder value, and other e-business metrics. Figure 1 has been re-drawn to highlight the unexplored relationships from previous research on business process change by Guha et al., (1997, p.121).

Information for this study was gathered from three data sources;

• Primary data – from interviews conducted between June and July 2000.
• Secondary data – from company documents collected or sent via emails.
• Tertiary data – from case articles written by authors or researchers.

Data-collection methods included a semi-structured case protocol; a qualitative interview questionnaire, multiple documents and archival records, and telephone interviews. Such triangulation reduces bias and is recommended in case research (Kean & Parent, 1998, p.308).

Figure 1. A Theoretical Framework of e-Business Change Management
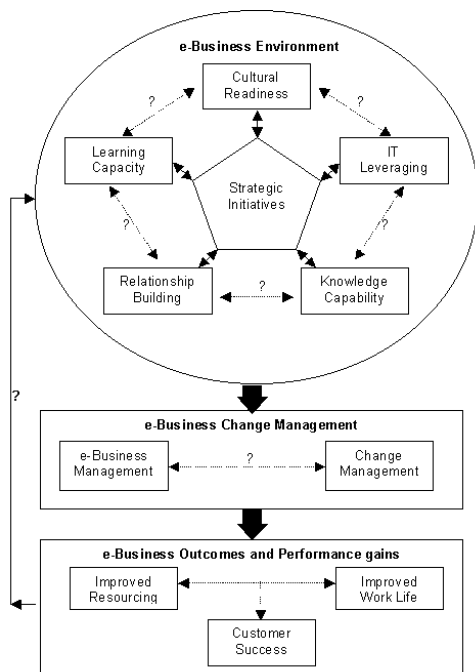
(Source: Adapted from Guha et al. 1997, p. 121)

Table 1: Ratings of the Components of eBC [low – moderate – high]

eBC Model *Components*	Wine Society	UNICEF Australia	Employ-National	* UBS	Halli-burton	British Biotech	*FSC	*Dell + LSI
Environment								
Strategic Initiatives	high	high	high	high	mod	high	[mod-erate]	high
Cultural Readiness	low	mod	low	mod	mod	high	low	high
IT Leveragability	high	high	high	high	high	high	high	high
Knowledge Capability	mod	mod	mod	high	high	high	mod	high
Relationship building	mod	mod	mod	mod	mod	high	mod	high
Learning Capacity	mod	low	mod	mod	mod	high	low	high
Management								
Change mgt practice	low	low	mod	mod	mod	high	mod	high
e-Business mgt practice	low	mod	low	high	high	high	mod	high
Performance Gains								
Quality of working life	low	mod	low	high	high	mod	low	high
Business resourcing	future	future	mod	future	future	high	future	high
Customer interaction	low	mod	future	future	future	N/A	high	high
gaps between expected & actual performance	small	small	small	small	small	small	some	small
e-ERP Success	very low	mod	low	mod	mod	high	mod	very high
* B2B Interaction	nil	nil	nil	nil	nil	low	mod	high

Ascending order of B2B interaction

* UBS – United Banking Services; FSC – Fujitsu Siemens Computers; LSI – Logic Systems Integration

INITIAL FINDINGS

All eight cases were used for an initial assessment of the components of the eBC model. A 'Summary of Comments' table was constructed for each case by collating the comments captured from each interview. Table 1 was then used to collate the ratings across all eight cases. In each case, the components were assessed for their contribution or influence to the project success, using a 3-point scale; 'low', 'moderate', or 'high'.

Overall the findings in Table 1 show Dell achieved most success, Halliburton achieved mod success, and the Wine Society was least successful. If we assume these ratings reflect the presence of facilitators and inhibitors, then the initial findings indicate that a successful project should have facilitators in all components, including the business environment and project management, e.g. Dell. 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 practice, e.g. Wine Society.

CASE BACKGROUND

The four cases, discussed below, provide the content for analysis against the eBC model. Halliburton is the representative of the cases in Table 1 that exhibit little or no inter-organisational focus; that is with 'nil' B2B interaction:

- Case 1, Halliburton [*nil*] business-to-employee (B2B[E]) "Employee Tracking"
- Case 2, Biotech [*low*] business-to-supplier (B2B[S]) "B2B Procurement"
- Case 3, FSC [*mod*] business-to-customer (B2B[C]) "Online Sales"
- Case 4, Dell + LSI [*high*] B2B[S] + B2B[C] "B2B e-Commerce Integration"

Evaluation of e-Business Success of 4 Cases

Consistent with the research objectives, specific probes were made concerning each construct. Table 2 below summaries the data gathered on each construct. In addition, any construct that had a positive or negative influence on conducting eBC, or overall eBC effectiveness, was documented with either a plus (+) or a minus (-) sign. These positive or negative influences were identified and cross-validated either through direct statements by the respondents during the interview or from other data sources.

Those with significant impact on the project success are in bold type (+) or (-). In some cases, both positive and negative (+ & -) contributions were found from one component variable. For Halliburton,

Table 2: Detailed Findings for each Construct with + & - Identified

eBC Components *constructs*	Case #1 Halliburton	Case #2 Biotech	Case #3 FSC	Case #4. [a]Dell & LSI[b]
Strategic Initiatives				
stimuli	+ pro-active?	+ pro-active	+ pro-active	+ [a]pro-active[b] +
formulation scope	incremental	incremental	revolutionary	[a]incremental, revolutionary[b]
decision making	autocratic (centralised)	+ champion emergence	- autocratic	+ [a]champion emergence[b]
strategy led	eventually	onset	-onset	+ [a]onset[b] +
Cultural Readiness				
change agents/leadership	+ & -	+	-	[a]+
risk aversion	welcomed	welcomed	cautious -?	+ [a]welcomed[b] +
extent of open communication	+	+	?	+
Learning Capacity				
improve efficiency	learn by doing	learn by doing response to IT change	learn by doing response to IT change	+ [a]learn by doing[b]
adaptation	+ learning from others			+ [a]learning from others response to IT[b]
learning type	double-loop	+ double-loop	single-loop	+ [a]double-loop single-loop[b] +
external information	boundary spanners	technology gate keeper	boundary spanners, customers +	+[a]boundary spanners, technology keeper[b]
use				
declarative knowledge	knowledge base	R&D resources IT development	R&D resources IT, knowledge base	+ [a]focus on core competencies[b]
IT Leveragability				
role of IT	+enabling & socio-technical	dominant factor	dominant factor	+ [a]enabling[b] +
use of Internet technol.	+ superior	+ adequate	+ adequate	+ [a]superior[b] +
Network relationships				
inter-organisational linkages	+ cooperative	+ cooperative	? cooperative	+ [a]cooperative[b]+
cross-functional cooperation	adequate	+ superior	adequate	+ [a]adequate[b] +
Change Mgt Practice				
mgt's. readiness to change	participative	committed	- participative	+ [a]committed, participative[b]
pattern of change	+	+	-	+ [a]
scope of change	improvement	radical change	improvement	[a]improvement, radical change[b]
managed change	alleviation of dissatisfaction	+ well managed process for change	vision for change, and well managed process for change	+ [a]evolutionary, revolutionary change tactics[b] +
e-Bus. Mgt Practice				
e-business measures	improvement feedback loop	improvement feedback loop	e-business information capture	+ [a]use e-bus metrics, audit[b]
use ofe-business tools &techniques	+ adequate	adequate	+ superior	+ [a]superior, adequate[b]
use of team structure	+	+	+	+[a]

Key: + = facilitator,   - = inhibitor,   + & - = facilitator and inhibitor, ? = unknown

leadership was found to exhibit (+ & -) contributions. In some instances, respondents chose multiple values for a specific construct.

FINDINGS AND IMPLICATIONS

Case Summaries

Case 1. For Halliburton the primary beneficiaries were the off-shore project managers who needed access to the HR employee tables for personnel management and gained this through the innovative use of web-based technology. The result was one of considerable costs saving and improvement of staff resourcing through improved decision making by the project managers when working off shore. The intrinsic motivation and self-management of autonomous knowledge within the development team played an important role in the successful implementation. The emphasis was much more on collective performance rather than individual, but at the same time, development and maintenance of personal and professional reputations was a significant driver. Interestingly, while the project was rated highly successful there was strong opposition from their partner operations to implement the same system. This came from the counterpart HR staff who had not been exposed to the participative development process. The organisational management was luke-warm in their support initially, viewing the proposed system as a threat to a strongly centralised control culture. Once the benefits broke down their initial reluctance, management assumed responsibility for the success and leadership for global implementation.

'We are very proud of our Web-based Personnel Reporting system.'

Case 2. Biotech is a research and development stage pharmaceutical company based in UK. Its mission is to create partnerships with pharmaceutical companies to complete the development and marketing of its compounds. The B2B Procurement project was able to ease the workload of the company's procurement department by automating the old, paper-bound purchasing process. The next step of the project was to negotiate more favourable conditions with the slimmed-down vendor base and build up closer business relationships with each one. Apart from more efficient purchasing procedures, the company's buyers have a more interesting job. Biotech's scientists should be relieved of routine paperwork, enabling them to concentrate more on research. B2B Procurement will broaden these people's day-to-day task base considerably.

'They'll have more time to spend on nurturing relationships and working on optimisation of projects and other duties.'

Case 3. This case study shows how computer technology division within a large global organisation succeeded in making the sell-side e-business processes available over the Internet. An Order and Request (extranet) System was developed as an appropriate online sales system by leveraging the power of graphics and Internet technology, thus extending the reach for cross-divisional users. The efficiency gains came from speed, accuracy and security of order transactions. The primary beneficiaries were the other business partners (divisions) and independent partners. The result was one of considerable cost saving and greatly improved online sales, through any time, anywhere access (Siemens, 1999).

Interestingly, while the project was rated moderately successful the opposition came from the partner reluctance to implement the same system due to the conflict of the established offline sales channels. Further, the lack of a coordinated corporate wide strategy by the parent company was viewed as the main obstacle for uptake of the system by the business partners.

The lessons learnt were two fold; (i) the use of a common platform needs the agreement of all functions, (ii) The internal and external marketing of the facility is essential to the acceptance of divisional business network and to foster end-user acceptance of the technological change in business practice. Once the initial benefits broke down user reluctance, management "assumed" responsibility and leadership for a new global stratgey. It highlights the need to evolve a coordinated corporate strategy and encourages the balancing of conflicting organisational knowledge when contemplating the adoption of e-business solutions.

'We are beginning to recognise the potential benefits of leveraging our e-business processes and functionality through the new Web-based environment.'

Case 4. In 2000 Dell pioneered its first B2B "e-Business Integration" with an established customer company, LSI. This case demonstrates a comprehensive approach to inter-enterprise computing. This is an example of an integration architecture made possible through a variety of backend systems and procurement systems. LSI, was able to leverage its existing backend system and SAP business Connector powered webMethods technology to communicate directly with Dell's e-business system. The integration between LSI's SAP system and B2B e-procurement application to Dell catalogues automated the procurement of Dell products via the Internet (Dell, 2000).

'We are beginning to recognise the potential benefits of leveraging our partners SAP R/3 business processes and functionality through the e-Commerce integration.'

Key Findings

In Table 2, Dell was classified as the most successful project consistently showing positive facilitators in all components of the eBC model. At the other extreme, FSC, which had many more inhibitors, was the least successful project. Inhibitors show the greatest clustering in the

Table 3: Benefits Realisation Factors by Construct

eBC Components constructs	Most Successful	Least Successful	Benefits Realisation
Strategic Initiatives			
stimuli	pro-active & reacting	reactive	pro-active in reacting
formulation scope	incremental	revolutionary	incremental in practice
decision making	champion emergence	autocratic	champion leadership
strategy led	Business a IT driven	IT strategy lead	IT aligned to strategy
Cultural Readiness			
change agents & leadership	+	-	need for change leader
risk aversion	welcomed	cautious	welcome change
extent of open communication	+	targeted	open communication
Learning Capacity			
improve efficiency	learning from others	response to IT change	learning induced by IT change
adaptation	learning by doing	learning by doing	learn to be efficient
learning type	double-loop	single-loop	learning from feedback
external information use	boundary spanners	technology gate keeper	collaboration with partners and competitors
declarative knowledge	focus on core competencies	R&D resources IT development	acknowledge knowledge is a corporate asset
IT Leveragability			superior IT not required but
role of IT	+ superior	- poor	* ensure IT is adequate
use of Internet technol.	enabling & socio-technical	dominant factor	intrinsic to work operations
Network relationships			
inter-organisational linkages	cooperative	non-cooperative/ competitive	* Trust and commitment not imperative but needs collaboration for emergence
cross-functional cooperation	superior	poor	
Change Mgt Practice			
mgt's. readiness to change	committed	resistant	* Mgt committed to
pattern of change	+	-	communicate change
scope of change	improvement	radical change	at all levels
managed change	well managed process for change	alleviation of dissatisfaction,	all aspects in evolutionary change pattern more successful
e-Bus. Mgt Practice			
e-business measures	use e-bus metrics	improvement feedback loop	user e-business metrics for feedback
use of e-business tools &techniques	adequate/superior	poor	educate about techniques
use of team structure	+	-	* reward teaming

*Key: + = facilitator, - = inhibitor, * = satisficing*

areas of cultural readiness and change management. The cases highlight the need to evolve a coordinated corporate strategy and encourage the balancing of conflicting organisational knowledge when contemplating the adoption of e-business solutions. While this research found an important role for IT in support of eBC, the message from these case studies is that IT should not drive e-business projects. These results confirm that the more successful projects were found to have facilitators in all components of the eBC 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.
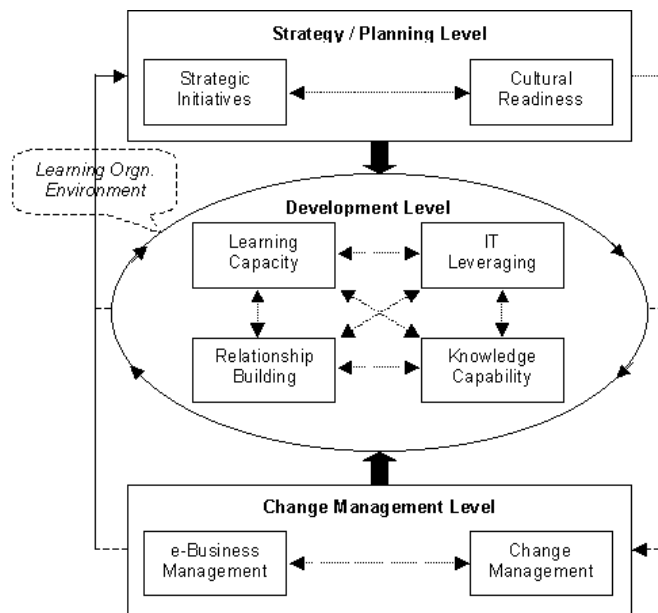
Table 3 is especially useful in separating those constructs that have variance across the range of B2B Interactions and those that have none. For *stimuli* all four case were the same, *proactive* but reacted very differently to stimuli. To be successful, eBC management must support a *proactive* way the organisation *reacts* to the stimuli.

While most successful organisations had positive characteristics, not all characteristics were seen to be equally important or indeed to directly influence success (Markus et al, 2000).

EXTENDED MODEL OF E-BUSINESS CHANGE MANAGEMENT

While the study used a flat eBC model where all constructs were considered antecedents to success, the results from the case analyses suggested more elaborate interrelationships. An extended eBC model is proposed for future studies to examine these inter-relationships between components.

Figure 2: Extended Model of e-Business Change Management

- have a propensity to learn from best practice and customer needs,
- exhibit learning whereby employees individually and collectively reflect on their past experiences, modify their course when necessary, and discover new opportunities, a new culture of the learning organisation.

Relationship Building - Successful eBC projects require commitment between partner organisations to use common IT platforms and sharing of corporate information.

Knowledge Capability - Successful eBC projects are enabled in organisations that leverage external information and experts, and focus on core competencies.

IT Leveragability - Successful eBC involves the coalescence of 'IT' and e-business best practice, whereby IT plays a supportive, but not always commanding role that is linked to the business case for eBC. Balanced consideration of the social, technical, and business value elements should be maintained during implementation.

(iii) e-Business Change Management Level:

- The nature of change was reported to be participative change resulting in an evolutionary change tactic. This was viewed as a "waterfall" progression of change, starting with an alleviation of dissatisfaction by employees and eventually working towards a well-managed e-business implementation from:
  the alleviation of dissatisfaction, with a vision for change, by evolutionary change tactics, a well-managed process for change.
- To achieve this requires continuous articulation and recognition of the value of reporting results, as well as monitoring each individual's contribution and accountability to the overall company's change effort. At this individual level, concern should be placed on how the eBC will improve employee satisfaction and the quality of work life (Guha et al, 1997).
- A well-defined transparent management approach should include a documented methodology of change, use objective and quantified metrics showing the value of change, continuously communicate process metrics to senior management, and possess a well-documented rollout of the new e-business design.

CONCLUSIONS

An established research framework of e-Business change is used to identify the factors for success of e-business implementations. The qualitative data provided content and discovery of elements that surround each construct to identify those facilitating and inhibiting factors that lead to ultimate eBC goals. The results confirm that a successful project was found to have facilitators in all components of the eBC management framework, including the change environment and management practice. Further, there is the implication that the least successful e-business projects will have inhibitors in both components, especially in the area of cultural readiness and change management.

The cases presented used an established research framework for gathering evidence to identify the factors for success of an e-business project. This research framework was chosen as a method for its ability to examine complex phenomena. It is seen as evolutionary in nature, and was content driven. It is essentially a diagnostic tool for identifying factors contributing to success of new business models. It specifically explores the areas related to the successful learning organisation where the key issues remain as people oriented organisational issues. In a labour force of inter-divisional virtual teams, management will be more about motivation, and governance may be largely a question of self-regulation rather than control.

While broad generalisations from the four case studies are viewed as premature, various patterns of constructs were developed as *indicators* that have implications for both research and practice. These patterns represent indicators for success, failure, a tendency to mediocrity, and variances across B2B interaction, where the latter is regarded as the most significant indicator.

The current findings are based on the analysis of only four key case studies, the eBC management framework (Figure 1) did provide an

(i)   Strategy / Planning Level
Strategic Initiatives

There tend to be strategic "stimuli" ranging from competitive pressures, continued market leaderships, customer expectations, employee dissatisfaction and/or organisation inefficiencies that trigger firms to undertake eBC management.

- According to these findings, eBC management has to be *proactive* to be successful, but by the way the organisation is *reactive* to the stimuli. This is viewed as a satisficing condition for eBC management success.
- *Incremental* eBC can work but appears to be appropriate when risk aversion is welcomed. Also *incremental* projects were perceived as *revolutionary* in nature.
- Successful eBC projects establish an objective and unbiased team or individual *champion* that continues to push the organisation and groups to find new innovative processes. These *champions* must be empowered to implement the changes within a culture of e-business readiness (Segev & Gebauer, 2001).

Cultural Readiness

To address complexities of change, each component must be aligned, along with the enabling technology, to the strategic initiatives (Hesterbrink, 1999):

- An organisation attempting to change performance radically seems to require some "sense of urgency" in their business situation, which translates in turn into a compelling vision that is espoused throughout the organisation.
- To overcome pockets of reluctance to change, an organisation's vision for change must provide an atmosphere of communication where individual concerns are not seen negatively but rather welcomed.
- An important ingredient in the right cultural mix for successful eBC is leadership from the top and initiatives from employees, together with an atmosphere of open communication, participation, committed cross-functional access to experts, and committed inter-organisational focus.

(ii) Development Level
Learning Capacity - Successful eBC projects are enabled in organisations that:

appropriate method for case study. While the study used a flat eBC model where all constructs were considered antecedents to success, a more elaborate testing would have involved interrelationships. A refined eBC model is proposed for future studies to examine the inter-relationships between components (Figure 2).

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