WHEN E-BUSINESS BECOMES K-BUSINESS…..WILL IT BE 'A NATURAL ACT'?

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Abstract: This paper proposes that the next wave of electronic business (e-business) will move from current transaction based e-business to the merging of e-business and knowledge management, and that organizations that have already internally adopted knowledge management (KM) will find the transition to this next wave of e-business a natural and sustainable act. The first part of the paper explores recent trends and forecasts pertaining to e-business and KM, concluding that organizations are moving towards a more networked economy where partnerships, collaboration and knowledge sharing will complement current transactional e-business, and that successful KM requires a balance between technology and organizational change interventions. The second part of the paper explores the issues associated with establishing a knowledge-sharing culture in preparation for the next proposed evolution of e-business by presenting interim results of a current study into the adoption of KM practices by staff in a global IT services company. Instantiating various adoption models, the study investigated time of adoption and potential factors that influenced the adoption of 2 KM applications by 283 survey respondents. The findings of this research are interpreted in light of the proposed next wave of e-business, providing additional considerations and actions that organizations may take to successfully participate in the evolution of e-business in a more knowledge sharing based networked economy.

1. INTRODUCTION

Although e-business has been with us for nearly a decade businesses use of e-business has been mostly informational or transactional and is still in the early stages of adoption and diffusion(Elliot 2002). E-business is seen by

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some as just another 'selling and distribution channel'(Needham 2002) though some are seeing the 'e-Opportunity[13]' as a chance to re-engineer business(Feeny 2001). Based on a review of the literature and our experience as practitioners in the field of e-business and KM we propose that the evolution of e-business, which we call the next e-wave, is moving beyond transactional e-business and building towards a world of partnerships, collaboration and knowledge sharing. We feel this evolution implies the merging of current e-business and a collective discipline currently known as Knowledge Management (KM) and will create a new knowledge-sharing era of e-business, one we could call k-business.

As this evolution takes place it will enable new highly interconnected organizational designs and models – it will also pose new questions and challenges. As organizations use e-business technologies to experiment with new forms of relationships to create and leverage new business opportunities, they will begin to redefine their traditional organizational boundaries. They will also pose new and interesting questions: what are the organizational boundaries?, how do I work with people who are both competitors and partners?, what knowledge do I value and must keep in house to protect vs. that which can be shared for mutual advantage or marketed and sold?. Organizations will also be asking their staff to behave differently – to collaborate and share knowledge with others – often former competitors – from outside of their own organization. Is this too big an ask? As organizations plan to exploit the evolution of e-business, will they be asking their staff to extend an existing KM system and its implied knowledge-sharing behaviors or will organizations be asking their staff to operate in the evolving e-business world and simultaneously develop a knowledge-sharing culture?.

Current KM literature proposes and recommends KM adoption theories based either on generic organizational change theories (Senge et al. 1999) or subjective views of the factors considered by consultants or interviewed managers as significant to an organizations success in KM and achieving a 'knowledge sharing culture' (Chiem 2001; Tissen, Andriessen, & Deprez 1998). There appears to be little empirical research into the factors that influence KM adoption and the timing of the KM adoption by *individuals* in a system. This paper explores the issues associated with establishing a knowledge-sharing culture by presenting the interim results of a recent study into the adoption of KM practices by staff in a global IT services company. Using Diffusion of Innovation and Collective Behavior theory as its theoretical foundation, the study looks at factors influencing the adoption

[13] E-Opportunity is a term coined by Feeny.

and timing of the adoption of the selected KM applications seen as relevant to the future knowledge-sharing based e-business.

The findings and their interpretation provide an empirical case study foundation for strategists and planners planning to establish KM systems and a knowledge-sharing culture internally in an organization as a pre-cursor to evolving their current e-business investments.

These propositions on the evolution of e-business, research results and interpretations are developed and discussed as follows. Section 2 provides a summary of e-business and KM today and proposes the knowledge-sharing evolution of e-business. Section 3 presents the study method and a general discussion and interpretation of the study results. Section 4 interprets the study results in light of the proposed evolution of e-business and contains a number of observations and recommendations for those planning to be part of the proposed evolution and then leads to some concluding remarks.

2. E-BUSINESS AND KNOWLEDGE MANAGEMENT – COMBINING FOR THE NEXT E-WAVE.

This section of the paper reviews e-business and KM today and develops the proposition that the evolution of e-business will be the convergence of these two disciplines. This convergence will allow new levels of organizational design based on dynamic organizational boundaries, communities, conversations and knowledge sharing. It concludes by suggesting that this evolution will require actions involving both technology and organizational change.

2.1 E-business Today

E-business today can be viewed in two dimensions; the business dimension and the consumer dimension. The business[14] dimension of e-business today is the world of business to business (B2B), business to consumer (B2C) and business to employees (B2E). Business' external use of the net and net technology has primarily been informational (or promotional), e.g. www.xxx.com sites, or transactional. Business' transactional use of the net ranges from net markets serving B2B needs through to consumer support for on-line purchasing or service support.

[14] Whilst the term business is used in the paper the propositions apply equally to government. Refer(Baum & Di Maio 2000) for a discussion on the 4 phases of e-Government being Presence, Interaction, Transaction and Transformation.

There is increasing discussion and some action about the opportunities to the redesign business and on the 'e-Opportunities' the net represents(Feeny2001; Powell 2000; Rozwell & Berg 1999; Schulman & Raskino 2001). Most of this discussion is focused on transactional and supply chain applications. Business' primary motivations for adopting of e-Business remain economy, service, new lines of distribution and speed. The current growth in investments and activity in the e-business space continues to be the implementation of existing technologies and transactional capabilities in an increasing range of industries, and new applications, across a broadening spread of organization types and sizes(Elliot2002). Ie More participants and an increasing range of available transaction types.

Consumers' use of the primary e-business delivery platform (the Net) is not limited to interacting with business. Consumers personal use of the Net includes communication and knowledge sharing between themselves using e-mail, bulletin boards, chat rooms and other collaborative tools that support the voluntary exchange of knowledge[15] provides an interesting insight into the possible evolution of e-business. The topics covered in these exchanges can range from topics of personal interest, personal interactions/contacts and views on products and services – their application and quality. The underlying conversational model allows many people to interact and share their information, opinion and, or knowledge. This knowledge sharing is uncensored, voluntary and without organizational boundaries. The consumer Net use is a world of conversation. Levine et al observe that now and increasingly in the future, 'Markets are conversations'. (Levine et al. 1999).

Businesses use of these collaborative technologies and applications internally to promote information and knowledge sharing also provides an indicator to the possible evolution of e-business. Business has begun to explore the external application of these collaborative technologies as we see the emergence of Extranets to facilitate virtual teaming between organizations[16].

Where will businesses' use of the internet head? Feeny (Feeny2001) proposes the e-Opportunity has three dimensions e-Operations, e-Marketing and e-Service and gives some insight into the next e-wave in his discussion of e-Service. Another likely directions are as a transactional platform for device-to-device communication. Yet another is as a key-enabler of new forms of organizational design – the blurring of organizational boundaries

[15] The individuals involved in this dimension may be in the general public or behind the organization's firewalls.

[16] These early interactions are often discrete and one-off based around a commercial opportunity, project or product development, and involving small and defined players from the parties involved.

and the emergence of community based organizational designs, conversations and knowledge sharing. (De Gues 1997; Levine, Locke, Searls, & Weinberger1999; Wenger 2001)

We propose that the pointers to the evolution of e-business lie in the convergence of current personal use of the Net (collaboration and knowledge sharing), the extension of businesses first steps towards B2B collaboration and virtual teaming and the forecast new organizational models based on collaboration and community based organizational design.

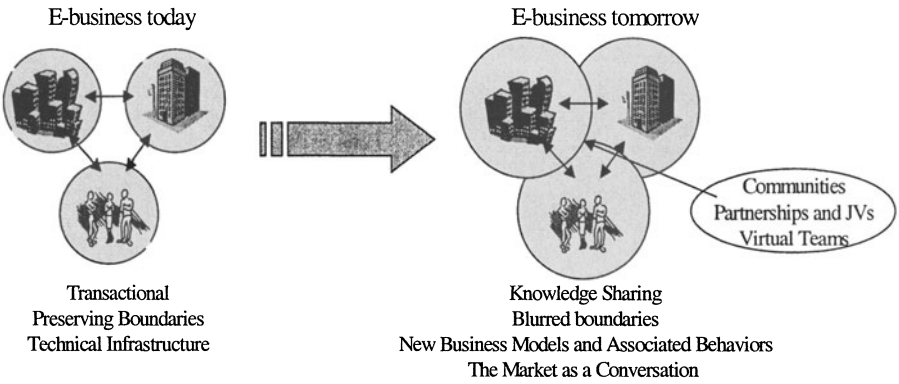

Figure 1. The proposed evolution of e-business

This proposition implies the marriage of e-business and a collective discipline currently known as Knowledge Management, the following section introduces some key KM concepts and applications relevant to this marriage and sets the scene for the research to be reported into the adoption of KM.

2.2 Knowledge Management Today

'Know how' is a term covering an organizations competencies and the skills of its people, its intellectual property and internal systems and its external relationships such as alliances, partners and customers(Sveiby 1997). KM can be seen as the coordinated effort to create and leverage an organizations 'know-how' value. Many writers see an organization's 'know-how' as its most valuable asset. (Davenport & Prusak 1998; Edvinsson & Malone 1997; Leonard 1999; Nonaka 1987).

KM covers a range of applications and technologies. Binney (Binney 2001b) provides a framework for this diversity, called the KM Spectrum,

that established that the KM applications discussed in the literature can be categorized.

Knowledge sharing in the evolving e-business model will likely take two forms, the sharing of explicit or codified knowledge and the sharing of tacit, personal or social knowledge. In this light the KM Spectrum categories of interest in the context of this paper are 'Asset Management KM' and 'Innovation and Collaboration KM'. The *Asset Management KM* category is where individuals and organizations contribute and reuse their explicit knowledge. Where this explicit knowledge has value to parties outside an organization there is a commercial opportunity to exploit this value with consumers, client organizations, partners and, or alliances. The *Innovation and Creation KM* category is of interest as it offers the opportunity for organizations to partner in new ways in order to create new, often virtual, organization structures and, or to collaborate in the development of new products, services and innovations. The collaboration and community model aspects of *Innovation and Creation KM* offer a new model for B2B operational interactions using collaborative technologies. On the B2C side communities offer an interesting model for consumers to interact with an organization and its individuals directly across organizational boundaries.

Organizations are using net technologies internally to develop intranets that provide a knowledge environment supporting their KM applications. A successful knowledge environment is seen as one that leverages existing explicit and tacit knowledge through reuse and contact mechanisms, and fosters the creation of new knowledge through real-time collaboration within virtual teams and knowledge communities[17]. To be of sustainable value these KM environments require responsiveness from the participants and currency of content (aka knowledge assets). A sustainable KM environment requires an organizational culture supportive of this responsiveness and knowledge sharing. Where organizations do not have a strong 'knowledge-sharing' culture organizational change interventions are normally required. It is increasingly recognized that establishing a knowledge environment requires a balance between implementing enabling technologies and organizational change interventions aimed at establishing a knowledge-sharing culture(Binney 2001a); (Leonard1999; Senge, Kleiner, Roberts, Ross, Roth, & Smith1999).

2.3 E-business – Tomorrow

The business focus of KM initiatives to-date has been on the creation and leveraging of know-how value internal to that organization. As discussed

[17] Innovation and Creation KM in the KM Spectrum

earlier there is an emerging business model where the boundaries and distinctions between organizations are being blurred and dynamically defined. Internet technology is allowing the creation of areas where parties can interact and do business – beyond transactions – into the world of knowledge sharing, collaboration, conversations and communities(Drucker 1988; McDermott 2000; Wenger2001). Another aspect of this emerging organizational model is one where conversations take place and significant knowledge is shared between parties as part of the way work is done.

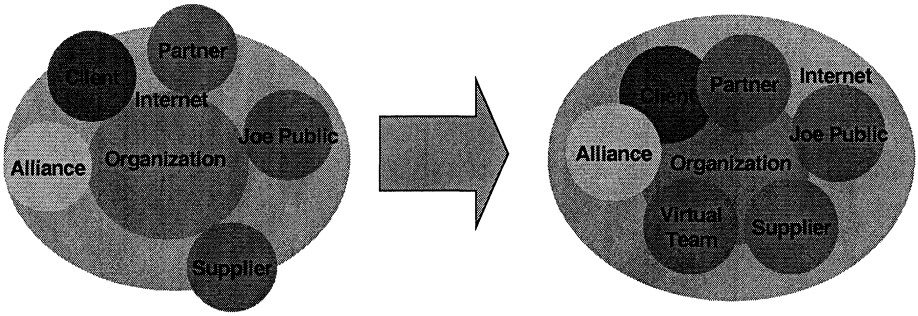

Figure 2. Envolving Business Models'

This new model offers business the opportunity to extend current B2B e-business to define and operate new partnerships and alliances aimed at the creation of new knowledge and products (innovation) when both parties contribute some of their know-how to create something new (Nonaka1987). The model also has the potential to extend B2C e-business beyond the e-Service opportunity proposed by Feeny (Feeny2001) in the direction foreseen by Levine et al(Levine, Locke, Searls, & Weinberger1999), where the 'Market (and all its interactions) is a conversation'.

How does an organization prepare for the evolution of e-business? We propose that organizations need to be prepared in two areas. The first is concerned with the effort required to establish the necessary technology environment, the second is concerned with the effort required to establish and sustain the necessary cultural environment.

Establishing the technical environment – Most current e-business systems have been designed for external use. In contrast most organizations are still designing their internal knowledge management and intranet systems with a view that they will only ever be used internally. Given that most organization's knowledge systems have been designed on this premise, they need to be re-architected to allow the 'opening up' of the organization. The literature is starting to recognize some of these issues at least as far as

IT support (Colville 2000) and security(Zannes 2000) are concerned. There has been little discussion on the areas IT will need to address which include shared domain issues such as security, content classification and segmentation, approaches to the integration with other parties' heterogeneous I/T environments and on self-service collaboration.

Establishing and sustaining cultural environment – An internal knowledge environment needs people to participate in terms of contributing assets, reusing assets, taking the time to interact with others by participating in communities and, or responding to requests for assistance. We propose that an external knowledge sharing environment will need the same conditions ie a knowledge sharing culture. As discussed earlier, the literature indicates that establishing a 'knowledge-sharing culture' requires varying degrees of organizational change interventions. As we shall see from the study results presented in the next section this takes time and the factors that influence individual adoption and participation in knowledge sharing vary between types of knowledge applications and vary over time.

3. RESEARCH METHODOLOGY

This section of the paper reviews a current study into the influences that affect the adoption and the timing of adoption of KM applications. The study was developed to investigate generic models applied to a wide range of social changes and their applicability when instantiated to KM as an innovation requiring changed behavior. The design of this study aimed to investigate and understand the adoption and the timing of adoption by individuals in an organization of selected KM applications.

3.1 Research Design

The core proposition to be tested in the research is 'that an individual's adoption of KM applications and the timing of that adoption is significantly affected by the identified potential influencing factors'. The 7 identified influencing factor categories are listed in Table1. Influencing Factor Categories and their Primary Source. Diffusion of Innovation and general Organization Design models of adoption provided the theoretical foundation for this research.

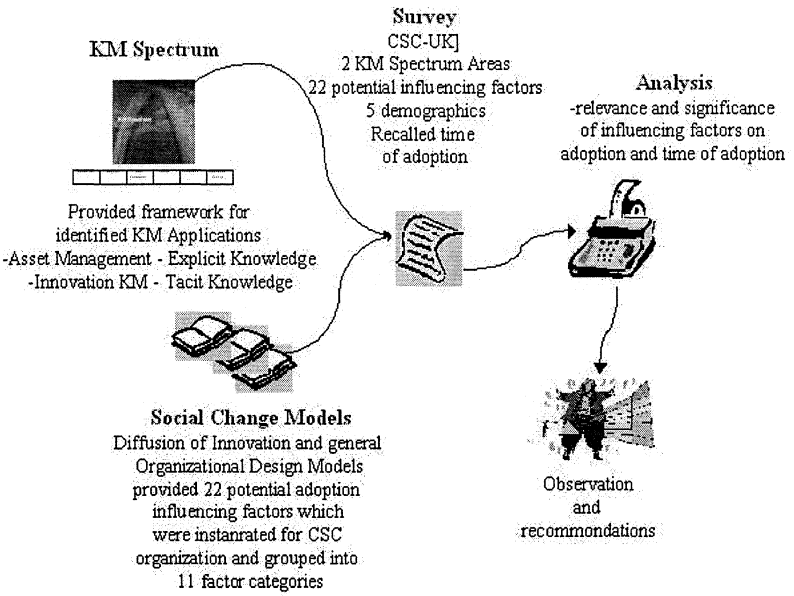

Figure 3. Overview of Research Model

The tool used to test the hypotheses derived from the core proposition was a survey of staff in CSC-UK. The survey instrument was designed using to collect the following the following groups of data.

The first group of data pertained to awareness, use and recalled time of adoption (first use) of the two KM applications. The recalled time of adoption questions asked *when the identified application was first used* in the nominated time increments over the past 5 years. The next group of data pertained to potential factors, which could affect the adoption of the identified KM applications. Diffusion of Innovation and general Organization Design theory was used to drive and instantiate the 22 potential adoption influencing factors to be tested in the survey. Diffusion of Innovation theory suggests that innovations are adopted over time by

different adopter types with each adopter type having distinctive adoption influences or motivations. Diffusion of Innovation theory posits that the process of adoption is a social process where individuals adopt an innovation at different rates based on a mix of influencing factors including connectedness, relative advantage, risk minimization, complexity, observability and opinion leaders. (Rogers 1995). The generic Diffusion Theory potential influencing factors were instantiated for the target audience in CSC based on interviews and a review of CSC's internal documentation pertaining to their KM system. The Organizational Design factors such as trust and encouragement, which appeared in the general KM literature, were also used. (Davenport & Prusak1998) The final group of data were demographics.

To assist with the analysis, the questions relating to these groups of variables were aggregated and binary versions of the aggregated variables generated – these binary versions are indicated by '_B'. The following table maps these potential adoption-influencing factors to the generic factors identified in Diffusion of Innovation and Organizational Design Theory..

Influence Factor Category		
Source	Survey Category [and number of discrete tested factors.]	Terms used in this paper
Diffusion Theory		
Connectedness	Internal Connectedness [2]	IC_B
	External Connectedness [2]	EC_B
	Overall Connectedness [2]	OC_B
Relative Advantage	Relative Personal Advantage Factors [8]	PLF_B
Risk Minimization		
Complexity	Ease of Use [1]	Ease_B
Observability	Role Influenced Respondent [1]	Role_B
Opinion Leaders		
Organizational Design	System Level Factors [8]	SLF_B
Demographics	Respondents Role [1]	RRole
	Organization Unit [1]	Org
	Age [1]	Age
	Gender	Gender

Table1. Influencing Factor Categories and their Primary Source

The survey was designed to be completed in less than fifteen minutes. A pilot survey was conducted with 6 participants. The results from the pilot survey were discard. The survey contained questions requested by the survey

sponsor in addition to those developed to test the research hypotheses – these sponsor-based questions were not included in the analysis.

The core proposition and the generated hypotheses were tested using different statistical methods. The tests were done in two stages, first at the binary aggregated influence factor level, as per the above table, and second, where the elements were found to be relevant in the first stage, at the survey variable level – Figure 4 provides an overview of the tests.

The first test used was a test for the relevance of the influence factor category. 95%confidence intervals (CI) was generated for each of the binary influence factor category variables and if the lower bound of the CI was greater than 50% influenced, then the factor was assessed as relevant, or of interest to the relevant population[18]. The second test used the same binary variables and tested for influence factor affect on the decision to adopt (Y/N) using a Chi-Squared Cross tabulation test for the binary adoption influence category variable vs binary adoption variable. The third test tested for affect on time of adoption for the cases where adoption had occurred using a Chi-Squared cross tabulation test for binary adoption influence category variable vs time period of adoption for cases where adoption had already occurred.

For each significant influence factor category in the above tests two further tests were performed to see which elements of the categories contributed to the significance. Descriptive techniques were used to determine if certain elements were more prominent in the responses. Where appropriate these descriptive tests were supported by further Chi-Squared Crosstab tests or by Analysis of Variances - ANOVA – tests on the discrete influence factors. The following diagram summarizes the test used in the research.

[18] A lower CI level of 50% was selected based on personal experience that management will more readily focus on something which influence the majority of staff.

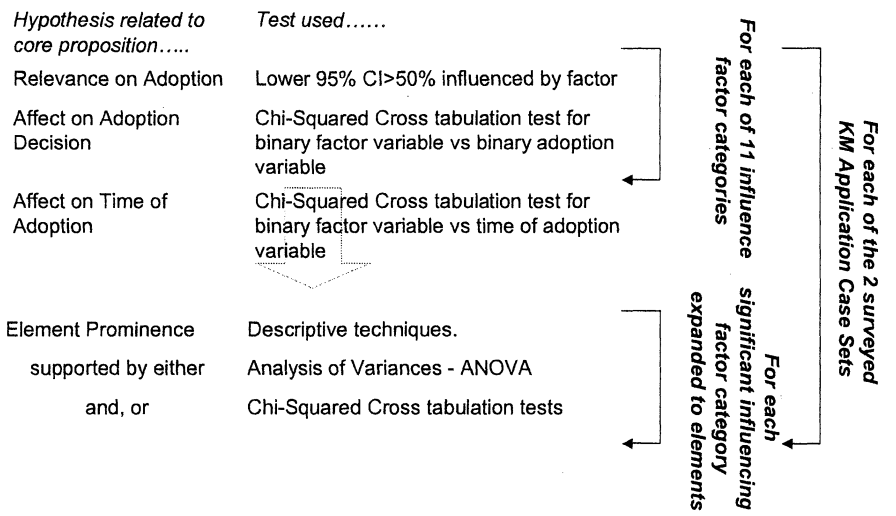

Figure 4. Overview of Tests Used in Research

In presenting the results, significance levels of 5% will be considered unless otherwise noted. The 95% confidence interval was generated using an Excel spreadsheet; all other analyses were conducted using SPSS Release 10.0.7 Standard Version.

3.2 Overview of CSC

Computer Sciences Corporation(CSC) is a US based multi-national company in the IT services sector. As indicated in its promotional literature(CSC Corporation 2001), CSC is a leading provider of information technology services to commercial and government markets worldwide. The services it offers include Consulting, Systems Integration and Outsourcing. CSC considers itself a knowledge-based company in that it's $US11.1billion annual revenues are generated by services based on the application of its employees' knowledge and experience, its accumulated IP and knowledge base, and a range of alliances with leading technology providers. Its 68,000 employees have access to a global web-based knowledge environment, called CSC Sources, which has evolved over the past decade. The KM applications used in the survey are part of this knowledge environment. CSC-UK is a fully owned subsidiary established in the UK in 1969. CSC UK has over 8,000 staff, is the fastest growing CSC division and accounts for approximately 33% of the CSC's revenues[19]. CSC-UK was selected for

[19] For additional information on Computer Sciences Corporation or CSC-UK go to csc.com.

this study due to its management's acknowledgment of the importance of KM to its business strategy, its history of promoting knowledge management applications and its relatively stable workforce over the period covered in the survey[20].

3.3 Results

The survey was conducted during September and October 2001. The survey was publicized on internal electronic bulletin boards asking people to visit the CSC-UK internet site and complete the survey. A total of 287 self-selected responses were received of which 4 responses were incomplete, deemed invalid and removed from the case set. The demographics; sex, age and length of service, of the 283 valid cases were compared to the corresponding CSC-UK population demographics, using the t-test for proportions differences, with the sample appearing representative of the overall CSC-UK population.

The self-selection technique of publicizing the survey being conducted and calling for voluntary responses means that there was no way of determining how many of the CSC-UK staff were aware of the survey and therefore determining the survey size and response rate. Whilst the demographics indicate that the sample is representative of the general population, the sample may be biased as the proportion of staff who didn't ever use the intranet and therefore by implication the KM applications (currently un-quantified) are not represented in the survey data. A sample size of 283 is statistically sufficient to produce reliable statistical inference for the factors examined in this study. It is understandable that further work of a qualitative nature would still be recommended in future work to strengthen the research model and emphasize, or otherwise, the findings of this research. In this sense, the survey tool conducted in this study and its results can be regarded as exploratory and as developing theory.

3.3.1 General Results of the Study

The following chart shows the cumulative adoption of the KM applications analyzed for this study.

[20] Whilst CSC-UK appears to have been achieving its growth rate without significantly increasing it's staff numbers.

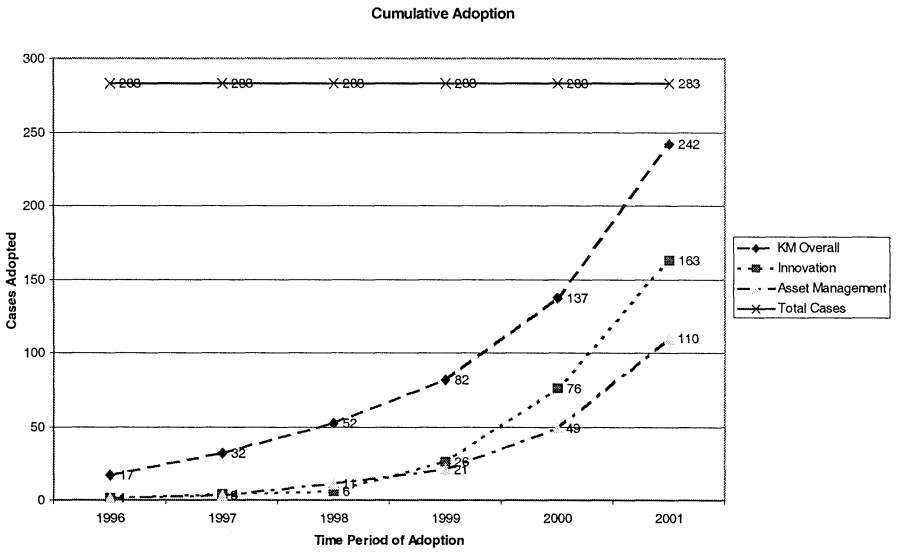

Figure 5. Cumulative Adoption

The proposition that individual adoption and therefore the diffusion of KM as an innovation are affected by certain influencing factors was supported in all case sets. The proposition that time of adoption is affected by certain influencing factors was supported for the KM Overall and Innovation case sets and rejected for the Asset Management case set.

At the time of the survey the following percentage of cases KM Overall (85%), Innovation (57%) and Asset Management (39%) had adopted the respective KM application. Assuming that the adoption process is not yet complete, as indicated by cumulative adoption slopes, then the survey is capturing a snapshot of the system in the process of diffusion rather than looking back at a system which has completed the diffusion process.

3.3.2 Detailed Results

The average time of adoption was for KM Overall (44.13 months), Innovation (51.68 months[21]), and Asset Management (50.78 months). The following table summarizes the test results. Relevant or significant results have been highlighted.

[21] Or 21.68 months when adjusted for general release of the communities application in mid-1999.

Adoption Type	Factor Category	95% Confidence Interval	Affect Binary Adoption χ^2 Test [p value] [Past% Future%]	Affect Processial Adoption Test χ^2 Test (p vaule)
KM Overall	slf_b	Relevant [100 100]		
	plf_b	Relevant [58 70]	Sig [.17][67 45]	
	role_b	Relevant [74 84]		
	ec_b			
	icl_b	Relevant [61 72]	Sig [.000][72 37]	Sig [.000]
	ocl_b	Relevant [75 84]	Sig [.006][82 63]	Sig [.000]
	ease_b	Relevant [81 90]		Sig [.010]
Demographics	rrole	N/a	Sig [.006]	
	org	N/a	Sig [.006]	
	age	N/a		Sig [.025]
	gender	N/a		
Innovation	slf_b	Relevant [100 100]		
	plf_b	Relevant [56 73]	Sig [.000][73 51]	
	role_b	Relevant [71 85]		
	ec_b			
	icl_b	Relevant [53 70]	Sig [.000][77 53]	Sig [.000]
	ocl_b	Relevant [68 83]	Sig [.013][85 73]	Sig [.011]
	ease_b	Relevant [81 94]	Sig [.000][77 55]	
Demographics	rrole	N/a		
	org	N/a		Sig [.000]
	age	N/a		
	gender	N/a		
Asset Management	slf_b	Relevant [100 100]		
	plf_b	Relevant [55 75]	Sig [.000][76 56]	
	role_b	Relevant [65 83]		
	ec_b			
	icl_b		Sig [.12][76 61]	Sig [.006]
	ocl_b	Relevant [65 82]	Sig [.21][86 75]	
	ease_b	Relevant [77 94]	Sig [.013][76 62]	
Demographics	rrole	N/a	Sig [.036]	
	org	N/a		
	age	N/a		
	gender	N/a		

Table 2. Summary Test Results - KM Overall, Innovation and Asset Management Case Sets.

The elements identified as a result of the exploratory Stage 2 tests (descriptive/ANOVA/Crosstab tests) are collectively presented in the following table for all three case sets. The identified elements are those that were seen to be significant amongst the elements aggregated for the above analysis of binary influence factors.

Factor Category	Identified Elements
slf	Encouraged to Research, Encouraged to Develop, Encouraged to connect, e-mail link
plf	Personal Effectiveness – Reuse, Personal Effectiveness – People, General recognition, Increase Skills
role	Peer same, supervising manager, Sources Staff UK, Sources Staff US[22].
course	Project Management, Catalyst (CSC's Methodology)

Table 3. Elements Identified in Stage 2 Tests

3.4 Generalized Results Discussion

This research provides evidence that establishing a knowledge-sharing culture, as defined by participation in the identified KM applications requires time to achieve a considerable level of participation. The average time of adoption and the current levels of adoption are: KM Overall - 44 months and 86% adoption; Communities[23] 21 months and 58% adoption and Asset Management 51 months and 39% adoption.

The results from the test of the potential adoption influencing factors investigated can be discussed in 3 groups. These groups are 1) those factors that were neither relevant nor significant, called *non-factors*. These non-factors are seen to have no significant impact on the decision or the timing of the decision to use a KM application, 2) those factors whose results were relevant but not significant – called *Environmental factors* as they can be considered as 'Pre and Necessary Condition' factors to adoption but did not affect the decision or the timing of the decision to use a KM application, and 3) those whose results were both relevant and significant in either, or both the decision to adopt and, or the timing of the decision to use a KM application – called *Adoption Factors.* The following table summarizes the results of this classification, which are then discussed with comments and interpretations in italics.

[22] In the Innovation sample Sources Staff US were not indicated, probably due to the maturity of the Knowledge environment when the communities application was implemented.

[23] . This figure has been adjusted for the re-launch of the Communities application in 1999.

Influence Factor Category	KM Overall	Innovation	Asset Management
System Level Factor (slf_b)	Environmental	Environmental	Environmental
Personal Level Factor (plf_b)	Adoption	Adoption	Adoption
Role Influenced Respondent (role_b)	Environmental	Environmental	Environmental
External Connectedness (ec_b)	Non-factor	Non-factor	Non-factor
Internal Connectedness (icl_b)	Adoption	Adoption	Adoption
Overall Connectedness (ocl_b)	Adoption	Adoption	Adoption
Ease of Use (ease-b)	Adoption	Adoption	Adoption

Table 4. Potential Influencing Factor Category Classification

Environmental Factors

1. All influence factors derived from general Organizational Design theory were environmental. The factors of most significance in the System Level Response category were responses to; Encouraged to Research, Encouraged to Develop and Encouraged to Connect which indicate an environment existed in CSC where the importance to use the KM applications is generally acknowledge and encouraged. This environment, whilst possibly needing to be in place as a precursor to adoption, did not have an affect on the actual decision to adopt.

   KM deployment plans need to recognize and encourage knowledge-sharing behaviour as a pre-and necessary condition to adoption but these environmental factors do not directly affect the adoption decision.

2. When aggregated role was an environmental factor and did not have an affect on the decision or time of adoption. The influence of other people (roles) in the organization on personal adoption was greater than 74% across all cases but was not significant in its affect on time of adoption. On closer investigation ANOVA tests showed that the actual role indicated did vary over time. Initially the role influence came external to the UK, from US staff, moved to UK support staff and is currently coming from the roles of Peers and Supervising Manager[24]. The degree of influence also increased through this period with the roles of Peer and Supervising Manager indicated in approximately 40% responses. This progression appears to be consistent with diffusion theory where there is a need to observe and reduce risks associated with the adoption of an innovation. Executive management were not reported as having any significant affect on individuals' decisions to use a KM application.

[24] Overseas influence was not observed for the communities application that was introduced after the UK support organization was in place and after other KM applications had been in use for a number of years.

Focus on interventions that demonstrate use and benefit with an early focus on first line management to provide re-enforcement and encouragement and peers to provide observed use and benefit.

Adoption Factors.

1. Personal level factors that reflected personal effectiveness were more indicated than those that provided recognition or personal development. The Personal Level Factors of most significance were 'Personal effectiveness through reuse' and 'Personal effectiveness through connection to others in the organization'. The potential personal benefit through increase effectiveness had a significant affect on the decision to adopt but not the timing of the decision.

   Focus on interventions that stress and demonstrate improvements in personal effectiveness.

2. Attending internal training courses were indicated in over 70% of responses. The factor seemed the most significant of all factors on the decision and the timing of the decision to adopt was attendance at internal courses. The courses contributed most to this significance were those that taught methodology and project management disciplines.

   The deployment plan should incorporate references and reinforcements to KM applications and behaviours in internal training.

3. Ease of use was indicated as an influence in the decision to adopt but not the timing of the decision to adopt.

3.4.1 Non-factors

The only influence factor in the non-factor category was external connectedness. External connectedness had an inverse affect on adoption with the respondents who were more externally connected less likely to use internal systems. This could be due to the value derived from and, or effort taken to maintain external connections vs. the additional effort and value from internal systems. *This factor may become important where management is promoting both external knowledge-sharing and continued participation an organizations internal knowledge program.*

4. PREPARING FOR THE PROPOSED EVOLUTION OF E-BUSINESS - CONSIDERATIONS

This paper has proposed that organizations are moving towards a networked economy where partnerships, collaboration and knowledge sharing: that the evolution of e-business will involve the merging of current e-business and knowledge management. It further proposed that the KM Spectrum applications of most relevance would be those that focused on explicit and tacit knowledge sharing i.e. asset management and innovation KM. The current survey into the adoption of these KM applications has been presented and generalized observations on the adoption of KM drawn. These concluding thoughts look at the survey results in light of the proposed evolution of e-business and may assist strategists and planners charged with the responsibility of positioning their organizations to be part of the next e-wave. This positioning can start now by establishing an internal knowledge-sharing culture as a parallel or pre-cursor initiative, so that the move to a knowledge-sharing e-business of the future will be a natural and sustainable act.

For strategists considering the next e-Wave:

- Achieving a k-culture takes time, it doesn't happen overnight
- Adoption is not influenced by management or executive mandate

For those responsible for developing and implementing a knowledge management program

- Deployment and organizational change interventions need to address both environmental and adoption influence factors, they should combine Collective Behavior and Diffusion of Innovation models. Having established the environment, attention needs to be given to relative personal advantage factors such as increased personal effectiveness.
- The timing of the decision to adopt is influenced by others (roles) and the ability for adopters to observe usage, minimizing risk and have demonstrated its advantages – deployment plans should look for opportunities to promote peer observation and demonstrate personal advantage, rather than appealing to higher order organizational benefits.
- The relative importance of the influence factors varies over time - this needs to be considered in the deployment interventions and associated messages.
- Sustaining a shared knowledge environment between organizations as a new business model is potentially going to be more complex than sustaining an internal knowledge environment, especially when the shared environment involves the intersection of more than one organization – it may require sympathetic 'k-sharing cultures' in all

parties to add sufficient value to the individual participants and to be sustainable.

The proposed evolution of e-business may represent the progression of Peter Keen's 'reach and range' model of business interactions(Keen 1991) by taking the range dimension beyond 'multiple cross-linked transactions' as organization interact with other organizations, and potentially any 'net-enabled individual', in new, more meaningful, and conversational ways.

Finally returning to Levine and co,

> 'Corporate firewalls have kept smart employees in and smart markets out. It's going to cause real pain to tear those walls down. But the result will be a new kind of conversation. And it will be the most exciting conversation business has ever engaged in'. (pg xiii, (Levine, Locke, Searls, & Weinberger1999)).

Whether this conversation and collaboration is between organizations to create new knowledge and exploit new opportunities (evolving B2B) or provide new levels of customer intimacy and service (evolving B2C), we believe it will require a knowledge-sharing culture that is a 'natural act' in order to allow organizations to more easily reap the benefits of 'the most exciting conversation'. It is hoped that the discussion on the evolution of e-business to a future based on collaboration and knowledge sharing, combined with the interpretation of the research presented in the paper may increase your e-business strategic planning awareness and provide a more complete picture of the elements required to seek and achieve success in e-business as it evolves.

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