Winter 12-19-2001

A Proposed Framework for Transition to an E-Business Model

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A PROPOSED FRAMEWORK FOR TRANSITIONING TO AN
E-BUNINESS MODEL

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ABSTRACT

E-business offers organizations many new strategic opportunities through virtual alliances and supply chain partnerships. As in the past, IT can provide organizations with unprecedented market advantages.   Thus, not engaging in e-business may prove to be costly in missed opportunities and lost leadership. However, transitioning from a *bricks and mortar* to an e-business model is not a simple task; it presents many major organizational challenges. These include adopting an organizational strategy that incorporates an information technology (IT) enabled business model, developing the IT infrastructure to ensure technology can be delivered to all users, managing change (i.e., overcoming resistance) and developing users of the new IT, redesigning or reengineering management processes and organizational structure to co-align with the focus of the business model. This paper suggests an organizational approach and presents a framework based on the MIT90 framework for successfully transitioning to an e-business model. Reengineering and co-alignment of the framework's components are vital to the underlying success.

INTRODUCTION

Electronic business (e-business) has heralded many new opportunities for business organizations through the expansion and enhancements of their markets, and the extension and broadening of their supply chains. Broadly stated, e-business involves the exchange (i.e., buying and selling) of products, services and information via computer networks, including the Internet [13]. Information technology (IT) has enabled organizations to develop strategies centered on an e-business model and implement radical changes to the way they conduct business. In one such ambitious instance of e-business, *virtual alliances* allow organizations to pool their resources for both economic production gains and extensive market reach. Recent developments in the airline industry exemplify this concept, particularly the Star Alliance and One World. Rather than one company expending and risking its resources to enter new markets, airline companies have joined together in cooperative alliances to offer seamless travel services that benefit the travelling public. IT has been the underlying enabler that has allowed this successful horizontal integration of market members to flourish through the electronic exchange of information.   The alliance also required members to coordinate and set a common standard of performance for their business processes to ensure its success.   Similar success has been achieved in their vertical integration. For example, fuel contracts are now *auctioned* over the Internet. Thus, the Internet and all of its associated IT have changed the means for conducting business.

IT can be a powerful tool that enables organizations to gain an unprecedented strategic competitive advantage in their markets. As cited in the case of American Airlines and Sabre in the 1980s [5], technology proved to be an essential element for a company to effectively compete and reshaped the way business was conducted in the

travel industry. Without adopting the same level of technology possessed by the industry's leaders, other companies could not remain competitive. The U.S. Justice Department later described this one-sided competitive advantage as being monopolistic when left in the control of a few. IT has the potential to radically change the business landscape.

Today, many organizations are finding themselves in similar situations. Not adopting an e-business model has placed them in precarious and less competitive positions, relegated to lesser roles in their markets. Yet, survival may require enormous investments in IT to enable them to become *e-business ready*. Simply introducing IT and building an IT infrastructure to support e-business may not sufficiently ensure the longevity of the business. Throwing more technology at a problem may not necessarily be the answer. Organizational as well as individual behavioral adjustments must be considered. To reap the rewards of IT and e-business, an organization must seriously evaluate its structure and processes (i.e., business, production, distribution, etc.), and determine how it can effectively integrate IT into them to achieve higher performance levels. Because the business models are drastically different, moving from a *bricks and mortar* business model to an e-business model requires radical redesigning or reengineering of its processes. The frameworks of Leavitt [15] and Scott Morton [22] indicate that changing an organization's strategy or its use of IT will profoundly affect its other areas.

In addition to organizational changes, individual behavior changes must occur as well. Several key IT management studies strongly suggest that the successful adoption of IT also requires implementing positive behavior changes [6], [7], [27], [28]. The absence of implementing such changes could stifle the transition. Thus, managing the adoption of IT within the organization may prove to be an essential step to successfully adopting an e-business model.

Moving from a *bricks and mortar* to an e-business model poses serious challenges. To the organization, e-business represents a new IT-enabled business model to which it must adjust into its current methods and practices of conducting business. Introducing new technologies poses few challenges that cannot be overcome through further investments in technology. However, further investments will have a limited effect on solving the overall problem. The greater challenges come from adopting IT since this requires organizational changes. Given the underlying strategic motives of e-

business, such as to effectively compete, offer and provide non-duplicable services to a broader market, and maintain, enhance or gain market share, radical changes involving reengineering the organization may be necessary. To successfully implement the e-business model, *What management issues or factors are critical to the adoption of IT? What organizational design changes are critical to ensure a successful transition?* The purpose of this paper is to identify and explore these issues.

BACKGROUND

Essentially, e-business is a business model that is enabled through information technology (IT). A business model represents a "clearly stated plan for adding economic value by applying know-how to a set of resources in order to create a marketable product or service" [18]. The model should address the organization's future growth through the development of knowledge (know-how) and resource acquisition. With e-business, business models tend to reorient the organization toward competing in global markets through electronic networks, including the Internet. Because IT enables and sustains these models, business processes that focus on optimizing individual tasks must be reengineered to allow the organization as a whole to better meet market requirements, and take advantage of alliances or partnerships that either help expedite the delivery of goods and services, or enhance or expand its markets. Hammer and Champy [12] define reengineering as "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed" (p. 32). An element essential to reengineering is *breakthrough* IT, new technology that supports the radical redesign and implementation of business processes. Thus, adopting an e-business model involves introducing unprecedented change, and acclimating the organization to operate in an IT-enabled and energized environment, one that requires reengineering the organization to better fit a different business paradigm. Hammer and Champy presented their reengineering concept as business process reengineering (BPR).

Transforming a *bricks and mortar* organization to an e-business not only focuses on adopting IT, it also involves reorienting its practices and process around the Internet. In this regard, El Sawy [9] suggests that reengineering is

necessary for "rethinking and redesigning business processes at both the enterprise and supply chain level to take advantage of Internet connectivity and new ways of creating value" (p. 7). Furthermore, reengineering changes enable and promote the flow of information both within the organization and with its supply chain partners. E-business also means structuring the organization to effectively and efficiently interact with others.

The transformation to an e-business model will impact several areas of the organization. As depicted by the MIT90 framework [22], an organization can be viewed as being composed of five interrelated components: management processes, structure, strategy, technology, and individuals and roles (Figure 1). Because they closely interact with one another, changes to any of the components will require changes to the others to bring their objectives and activities back into alignment. For example, to fully benefit from the adoption of a new technology, an organization must examine its management processes, structure (lines of

communication) and people skills (individuals and roles), and if necessary redesign them (i.e., implement change) so they are consistent with and support one another. Otherwise, this becomes a mere exercise in automating, rather than a strategy to seize new opportunities. In the case of e-business, this would be particularly applicable to all components. The adoption of an e-business model reflects a new strategy of the organization. The IT-enabled business model directly affects management processes, such as those linked to the electronic exchange of information and decision making, structure, and roles and individuals. For the organization to benefit from IT, both end-users and IT personnel will have to acquire skills and knowledge that can manipulate (i.e., take advantage of) that IT [11], [22]. McKersie and Walton [17] refer to this as the alignment between the organization's requirements (i.e., information, communication, coordination, etc.) and its capabilities. Others refer to this as co-alignment [23].
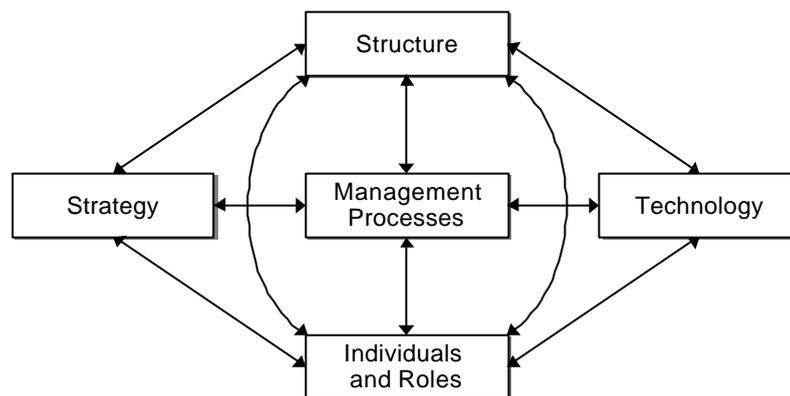

Figure 1. MIT90 framework

Leavitt [15] presents a four-variable framework and proposes similar arguments. His framework shows the organization as a complex system of four interrelated variables: task (strategy and business model), structure (communication, authority and workflow), actors (people), and technology (the means and techniques for performing tasks and accomplishing goals). Changes to any of the variables will result in compensatory (or retaliatory) changes in the others. The internal adjustments are critical to ensure efficient coordination [25]. As in the case of BPR, total redesign of the organization may be required [19]. Neither framework indicates specific

changes, only that change will ripple throughout the organization.

Organizational and Individual Change

Often, technology changes in an organization occur for two primary reasons: advances in IT, and changes in the competitive marketplace (i.e., environment). Advances in IT enable change (i.e., allow it to do something better) and lead to changes in an organization's business processes. The size of the change (i.e., minor vs. major) depends on the type of technology the organization adopts and the objectives for adopting the technology. Most

organizations will initially embrace IT through promises in efficiency gains, usually stated as a reduction to the cost of production [22], or increased productivity [26]. Over time, their use of a technology matures and new opportunities are frequently discovered. For example, advances in network, database and workstation technologies have led to reductions in the cost of transmitting, retrieving and processing information in the banking industry. By adopting these technologies banks have been able to reduce the cost of processing a customer's transaction through their networked automatic teller machines (ATMs) compared to a (human) teller. As they developed their IT infrastructures and began placing ATMs in stores, kiosks and other non-typical banking locations, banks were able to increase their market presence, and sell *convenience* to their customers and other banks (i.e., network banking). Although the cost of adopting newer technology proved to be a major investment whose acquisition was difficult to justify on cost reductions alone, IT played a major role in enabling new opportunities. Today, electronic banking allows banks to extend their services beyond the confines of a brick and mortar operation, and radically change their business processes and structure. For example, customers may apply for mortgage and equity loans online. Thus, when pushed to an extreme, new IT can become the impetus behind organizational reengineering.

When changes occur in their competitive environment, organizations will often respond by seeking innovative applications of IT to either enhance or enlarge the scope of their products and services, or remain competitive [24]. The objective for adopting newer technology would be to help distinguish themselves from others in the marketplace or focus on specific segments of the market. Thus, the adoption incites at least operational changes within the organization, if not a strategic change. At the strategic level, new IT provides the means for developing new corporate strategies, such as vertical and horizontal alliances, and *virtual* organizations, global organizations that assume separate identifies from those that comprise them [22]. Vertical alliances consist of vertically integrated organizations working together as single supply chain. In contrast, horizontal alliances address the need for global competition through partnerships.

In either case, the introduction of new technology requires people to change their *behavior*. Lewin's [16] theory of change suggests that organizational driving forces must overcome organizational restraining forces fo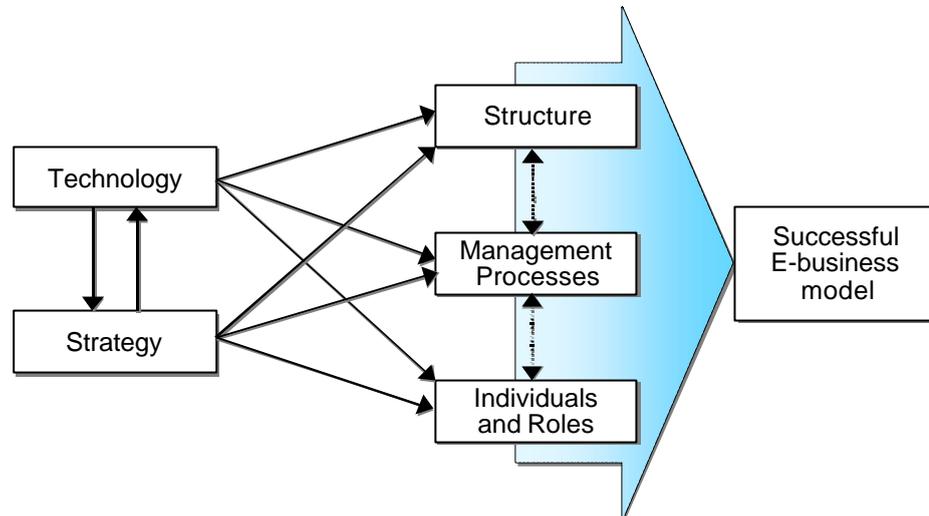r change to occur. This involves unfreezing (preparing for change), moving (implementing change), and freezing (reinforcing change). How an organization overcomes the resisting forces is critical for two reasons. First, when improperly managed, change can leave an organization in a no better situation than before, in which case it defeats the purpose for change. People by nature will resist change unless they can be convinced they can directly benefit or succeed from the change (outcome beliefs) and the energy they exert to modify their behavior will be minimal (self-efficacy beliefs). Davis' [6] theory of perceived use indicates that users of IT will commit themselves to change only if they believe the effort required to adopt the change (i.e., perceived ease of use) is worth the gains they will realize (i.e., perceived usefulness). These constructs (outcome and self-efficacy beliefs) form the conceptual foundation for the technology acceptance model (TAM) [7], [27], [28]. Also, once initial impressions are formed, their level of commitment (to change) will be difficult to change [4]. Thus, change must be introduced in a positive manner. Other factors that influence the adoption of IT include organization culture, knowledge sharing and learning [14]. Secondly, Osterman's [20] survey of organizations adopting new IT reveals differences in productivity gains and quality improvements when human resource policies are supportive of the change. In many cases, the difference between organizations with low commitments to human resource policies, and either low or high investments in new IT was negligible. In contrast, organizations that provided employee support and training reaped greater benefits beyond the change in technology. Thus, adopting new IT not only focuses on the physical changes, it requires users to embrace change. For an organization to fully profit from the adoption of new IT, management must effectively manage change.

Moving to an e-business model requires the implementation of strategic and IT changes. However, for the organization to efficiently achieve its new objectives and goals, it must examine how it will integrate technology into its structure and processes, and how its end-users and IT personnel will use the technology to benefit the organization. This assessment will, in turn, trigger the reengineering (redesign) of business processes and development of people skills and knowledge.

REDESIGNING AN ORGANIZATION FOR ELECTRONIC COMMERCE

The successful transition from a bricks and mortar environment to e-business will require recognizing the need for organizational change and carefully planning change among the interacting components. An

together toward achieving its redefined goals and objectives as envisioned in its strategy, all aspects of its operations must be co-aligned. Figure 2 depicts the hypothesized associations among the components of the

organization's decision to enter the e-business market reflects its management's vision to improve the organization's position by redirecting its resources to seize new opportunities made possible through the advances in IT. To ensure the organization works

MIT90 framework. It suggests that the technology and strategy components will determine the structure, management processes, and individuals and roles. Only after all components are co-aligned will a successful e-business model evolve.

Figure 2. Research model

Since the e-business model is IT-based, two events must first occur: an advance in IT becomes a resource of the organization, and management formalizes its vision to integrate IT into its strategy. Historically, management's vision and strategies frequently determined the technologies the organization would adopt. Today, this approach does not necessarily hold true. As a major enabler, IT has the ability to reshape the organization's future, and influence or enable strategy. It can be used to recognize and seize new opportunities. However, IT alone cannot achieve performance gains [17]; the two components must work together.

> *Proposition 1:* Adopting an e-business model requires major changes to an organization's IT and IT infrastructure.

The adoption of an e-business model marks a major change in direction for the organization as prescribed by its strategies. The change will require new investments

in network and Internet enabling technologies (i.e., resources), and its IT infrastructure, that is all associated technologies that render the network and Internet technologies accessible and usable throughout the organization. Importantly, the infrastructure must not only support the information needs within the organization, but it must also be capable of extending beyond the organization and interfacing with external entities in business-to-business (B2B) and business-to-consumer (B2C) interactions. Thus, introducing e-business IT to the organization represents an important initial step involving acquisitions. However, adopting the newer IT requires integrating with existing technologies and successfully applying it through application development. Because changes to IT and the IT infrastructure are believed to be a fundamental to e-business, all organizations must commit themselves to at least this change. They will impact the capabilities of the other components.

Proposition 2: Organizations that successfully transition to an e-business model will have reengineered their management processes.

Management processes are those process that ensure the orderly production of goods and services, and efficient use of resources. In a bricks and mortar operation, management processes tend to be isolated and disconnected from other processes. Often, they focus on performing a single task efficiently without concerns for other tasks or production as a whole. The situation becomes worse when external entities, such as suppliers and partners, or multiple facilities are involved (in the production). This problem may be attributed in part to (organizational) *silos* that promote self-sufficiency in functional areas, and the lack of information flowing between processes. In contrast, e-business models emphasize coordination. IT becomes the means for transferring vital information between business units, and thereby enabling managers at the lower levels of the organization to assume greater authority over key decisions and coordinate their tasks with other managers at their level. Discernible boundaries that once separated the activities of departments become less apparent. The same applies to interfacing with external entities, such as suppliers or buyers. With e-business, management process will be reengineered to support integration and coordination through IT. Information shared among business units and external entities allows their processes to be consistent with one another.

Proposition 3: Organizations that successfully transition to an e-business model will have reengineered their structures.

Traditional organization structures are hierarchical and were built along functional lines. Their lines of communication follow the same pattern and tend to be one way, from the top down. Information is filtered and modified as it makes its way through different levels of management. With the e-business model, organizations must have the built-in flexibility to move swiftly toward capturing new opportunities or react quickly to shifts in the environment. The faster pace at which business is conducted also requires the organization to be more responsive to its customers' needs. Communication needs to be bi-directional. Innovation often occurs at the lower levels of the organization, and must be recognized by upper management, particularly if it can become part

of strategy. At the same time upper management must be able to direct the organization to function as a single unit and encourage innovation. As in the case of management processes, organization structures must facilitate expedient communication among business units and their managers through IT. With the e-business, *getting the right information to the right person at the right time* becomes more critical.

Proposition 4: Organizations that successfully transition to an e-business model will have successfully aligned their human resources to the e-business technology.

A key element to ensuring the successful implementation of the e-business model is the development of human resources. IT by itself will not produce gains; users through their actions will eventually decide whether a technology is successful. The TAM (model) stresses that the use of IT will only succeed if users (i.e., end-users, IT personnel) perceive significant gains in using it. Following Ajzen's [1] assertion that self-appraisal of intended behavior is the best predictor of subsequent behavior, TAM suggests that users who commit themselves to using a system (after an initial exposure) will follow through (with their commitment) and use the system. Preparing users for the transition to e-business will be a critical factor to success.

The adoption of an e-business model will require the organization to retool users with new skills and knowledge, acquire human resources knowledgeable with the e-business technology, and/or contract with another organization the tasks of implementing and maintaining the technology (i.e., outsourcing). The former case can be successfully addressed through change management and organization development [3]. Whereas change management oversees the transition (change) from one state to another, organization development (OD) places its emphasis on developing an organization's human resources to improve organizational effectiveness through the integration of individual needs and the interests of organization goals, resulting in greater organization effectiveness [2], [10]. In contrast, change management includes managing changing, reducing resistance, and increasing support and commitment to the change. Management's commitment to both change management and organization development will ensure that users' activities and contributions will be supportive (i.e., co-aligned) of the organization's new strategy, goals and

objectives. Directing vital organizational resources toward both may also contribute to eventual user proficiency and satisfaction, and further innovation.

> *Proposition 5:* The degree to which an organization successfully reengineers (redesigns) will influence its success with adopting their e-business model.

The resources and energy placed into implementing change reflects a cumulative (total) effort and the commitment of top management. Many trade publications often extol the virtues of BPR and warn of its failures. They often cite as the leading causes for failed reengineering attempts the lack of resources committed to reengineering and plans that restrict reengineering to a narrow subset of the organization (i.e., myopia) rather than the whole. Partial commitments of resources or localized planning of an e-business model will lead to the same failures or shortcomings (i.e., outcomes fell below expected performance levels). For the e-business model to succeed, all components of the model must experience change to co-align them. Because the components in the model interact with one another, it may be difficult to isolate and examine the effects or associations between two components. Also, when working together, the components may produce a high level of synergy through their interactions. Thus, the effects or associations may be greater than their sum, and other factors may be present.

METHODLEDGY

Data will be collected through a survey of private, non-profit and government organizations in the US and Taiwan. The survey instrument (under development) will be composed of three sections: the demographics of the organization, the changes to the organization, and the results the changes (outcomes). Items appearing in the latter two sections will be measured on seven-point Likert-type scales (strongly disagree/strongly agree and not benefit/greatly benefited, respectively).

The changes to the organization section focuses on determining the types of changes and the degree to which they occur that organizations experience during their transition to an e-business. The changes are based on the MIT90 framework. Each item will characterize

change occurring within a component of the model (Figure 2).

The results of the changes section (of the survey) will identify the major end results (outcomes) organizations experienced and the degree to which they benefited from the result. Based on the proposed model, changes that did not occur, or were not fully completed or committed to during reengineering or redesign are expected to have an impact on the end results. However, it is not known to what degree these changes in the organization will have on the outcome.

For this study, the success of an organization's e-business model implementation will be measured by the difference between the expected (i.e., pre-implementation) and actual (post-implementation) results. Studies that have examined information system success have taken this approach [8], [21], [29]. Their results suggest that success is comprised of two major factors: implementation success (organizational implementation success, project implementation success, and technical implementation success), and system success (data quality, system quality, and perceived net benefits). Essentially, they examined whether the benefits that were originally sold delivered.

SUMMARY AND CONCLUSION

Committing the organization to e-business involves managing changes. Using the MIT90 framework, this research study posits that change must occur in five areas (components) for an organization to successfully transition to an e-business model: strategy, technology, management processes, structure, and individual and roles. It is important that change be planned and managed to ensure all areas are not only changed, but also co-aligned. When undertaken in a holistic manner, the organization will reap the benefits of the business model. Without co-alignment, activities and tasks performed within the area would not be supportive of the organization's presiding strategy, goals and objectives, and may be counterproductive.

The distinct differences between the *bricks and mortar*, and e-business models require a complete evaluation of the how the organization conducts its business, and will lead to the reengineering of its business processes. This may include developing interfaces with other organizations. Because e-business is based on an IT-enabled business model, reengineering will need to focus on integrating IT throughout the business model and

coordinating the activities to ensure everyone works in a concerted effort.

The framework proposed in the study suggest that the strategy and technology work together: strategy specifies how IT will be used to strategically position the organization and technology enables the organization to identify and seize new opportunities. Once in place, these components set the tone for change in the other components. Reengineering management processes and structure address the flow of information and enable managers through the organization to be consistent with their decisions and in their actions. Change management and organization develop play important roles to ensure people use the new IT in a manner that supports the organization. Only after reengineering will the organization reap the full benefits of e-business.

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